Inflation Targeting in MENA Countries

An Unfinished Journey

Edited by Mongi Boughzala and David Cobham

Inflation Targeting in MENA Countries

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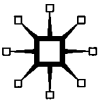

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Preface

This volume resulted from a seminar on 'Monetary Policy and Inflation Targeting in the Middle East and North Africa (MENA) Region' held in Tunis in October 2008 and organised by the Economic Research Forum (ERF), the Euro-Mediterranean Forum of Economic Research Institutes (FEMISE) and the University of Tunis El-Manar. This important event took place following the announcements by three countries of the region, Egypt, Morocco and Tunisia, that they intend to adopt the more coherent and more demanding monetary strategy called inflation targeting (IT). The three countries have also indicated that they are preparing for this major transition, that is they are strengthening their financial systems, improving their fiscal performances, moving to more flexible exchange rate regimes and implementing a set of technical and institutional reforms required for the conduct of this more effective monetary policy.

Turkey has already gone through a transition period and formally switched to IT in 2006. The successful experience of Turkey and many other similar countries has made IT more popular. However, there is still a need for further debate and analysis on this issue before the final move to IT in the three MENA countries. The financial crisis has raised additional concerns about the optimal design of monetary policy and the role of the central bank. The purpose of the Tunis seminar was to contribute to this debate, not just for these countries, and that is also the aim of this volume.

In agreement with ERF and FEMISE, and given the scope of this theme, the editors decided to include some additional contributions, in the form of Chapters 3 and 4. The other chapters are updated versions of papers presented in the seminar. Chapter 6 is based on a paper accepted for publication by the *Middle East Development Journal*, and we thank its Managing Editor for his permission to publish it in this volume and his support for the wide dissemination of ERF- and FEMISE-sponsored research.

We would also like to thank Ahmed Galal, President of FEMISE and Managing Director of ERF, and Jean-Louis Reiffers, Chairman of FEMISE's scientific committee, for their support for this project.

The MENA region needs more research and debate on key macroeconomic issues and more generally on outstanding social issues. We are pleased to announce that this volume is going to be the first in a series of books that FEMISE has launched.

Mongi Boughzala and David Cobham
January 2010

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1
Introduction

Mongi Boughzala and David Cobham

Inflation targeting (IT) has become a popular monetary policy strategy since it was adopted by New Zealand in 1989. In the Middle East and North Africa IT has already been introduced by Turkey and is being considered, more or less seriously, in three other countries: Egypt, Morocco and Tunisia. This book is intended to consider the issues surrounding the adoption of IT in these countries, against a background of monetary and financial developments in Middle East and North Africa (MENA) countries more widely.[1]

Standard definitions of IT highlight both the requirement for a numerical inflation target and a range of other features. Mishkin (2004: 1), for example, lists the following elements: 1) the public announcement of medium-term numerical targets for inflation; 2) an institutional commitment to price stability as the primary goal of monetary policy, to which other goals are subordinated; 3) an information-inclusive strategy in which many variables, and not just monetary aggregates or the exchange rate, are used to decide the setting of policy instruments; 4) increased transparency of the monetary policy strategy through communication with the public and the markets about the plans, objectives and decisions of the monetary authorities; and 5) increased accountability of the central bank for attaining its inflation objectives. Roger (2010: 30) also emphasises that policy actions should be based on a forward-looking assessment of the prospects for inflation. However, there is some debate about whether quantitative targets for inflation are strictly necessary, and some observers describe the monetary policy regimes of the US and the Eurozone, which do not have formal targets of this kind, as 'informal' IT.

Some 29 countries have adopted IT and three have dropped it (not because they decided it operated inefficiently, but because they joined

the European Monetary Union). Initially most of the adopting countries were high-income Anglo-Saxon or Scandinavian countries (though not the US), but later a number of transition countries and then emerging market countries introduced IT (Hammond, 2010; Roger, 2010; Schmidt-Hebbel, 2010). Figures 1.1 and 1.2, reproduced from Roger (2010) show how monetary policy regimes in industrial and non-industrial countries have changed since 1979: among the former, monetary targeting has disappeared and exchange rate targeting has all but disappeared; there has been a big increase in managed floats with multiple targets (which includes informal IT), and a big increase in (formal) inflation targeting. Among the non-industrial countries, exchange rate targets remain by far the most common monetary policy regime; managed floats with multiple targets became less common after the mid-1990s; monetary targets grew till the late 1990s but then receded; and inflation targets became more popular from the late 1990s but remain relatively uncommon. Most of the countries which adopted IT did so because they had had poor experiences with other monetary policy frameworks. Many of the Anglo-Saxon countries, for example, had tried monetary targets and/or exchange rate targets, while several of the Scandinavian countries had suffered exchange rate crises which forced them to abandon exchange rate targets.

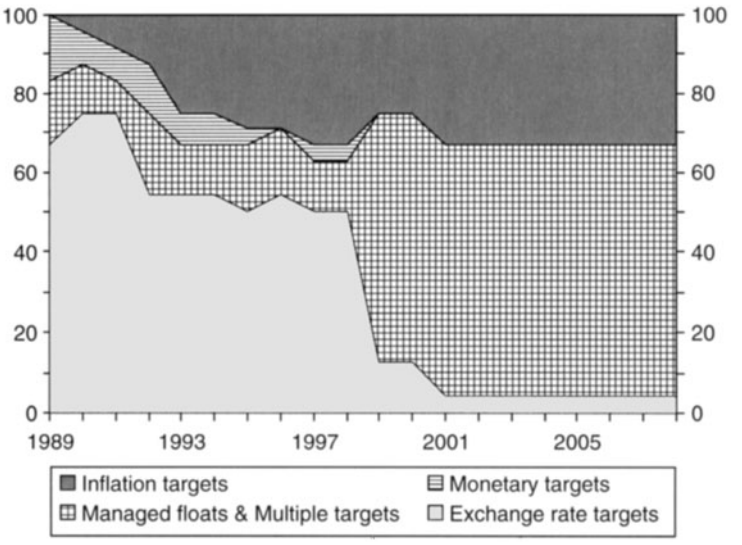

Figure 1.1 Evolution of monetary policy regimes, industrial countries
Source: Roger (2010, Figure 4.1 (a)).

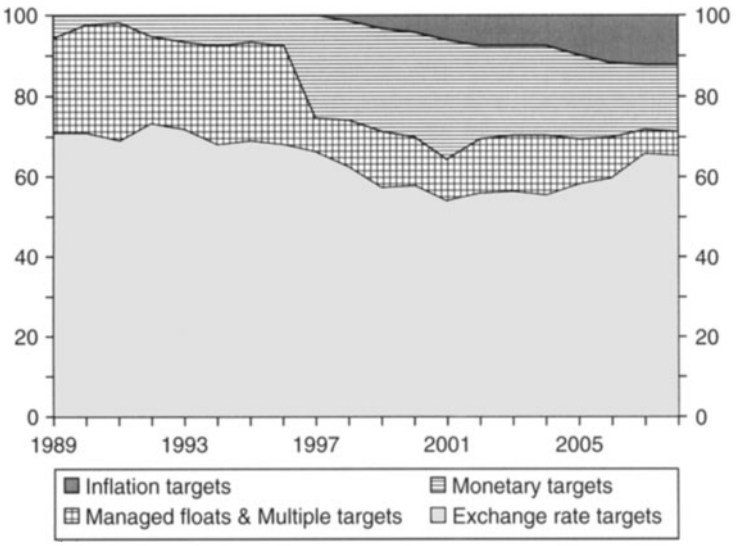

Figure 1.2 Evolution of monetary policy regimes, non-industrial countries
Source: Roger (2010, Figure 4.1(b)).

The fundamental case for inflation targets is that they enable a country to pursue the final objective of inflation, in a way that means it cannot be knocked off course by a change in the relationship between some explicit intermediate objective (e.g. a monetary aggregate) and the implicit final objective; and that they genuinely deliver low inflation without poor growth or employment consequences. In addition, it can be argued that inflation targets are better at handling all types of demand-side shock, whereas monetary targets cannot deal easily with money demand shifts and exchange rate targets cannot deal easily with domestic or foreign expenditure shocks. On the other hand, inflation targets are likely to perform worse in the face of supply shocks than other monetary policy strategies such as monetary or exchange rate targets. This means that they are more suitable for countries and periods where supply shocks are relatively limited, at least in comparison to demand shocks (as may have been the case in the Great Moderation, for example).[2]

Inflation targets are also subject to much longer lags between policy actions and changes in the target variable, which means both that they are harder to verify and that the control of the target variable is likely to be less precise. In fact, it seems that IT countries have often missed their targets, but less frequently in 'stable inflation' situations

(when inflation has already been brought down to a low level and the authorities are trying to stabilise it there rather than reduce it further) than during periods when the target is being gradually reduced, and less often in high-income than in low-income countries (Roger, 2010).

The effect of IT on inflation itself has been the subject of some controversy. Most IT countries have experienced significant declines in inflation since they introduced IT, but most non-IT countries also experienced much lower inflation in the 2000s than in the 1990s. In principle to assess the contribution of IT to low inflation we would need to know what inflation would have been in the IT countries if they had not had IT, but this is unknowable. In practice researchers have used synthetic 'counterfactuals' in the form of the inflation rates in comparable non-IT countries or in IT countries before they introduced IT. But what do we mean by 'comparable' countries – comparable in size, in openness, in degree of (real or financial?) development? Moreover, there may be some self-selection bias: the countries that adopt IT may be exactly those countries which stand to benefit from it most because they have low credibility and/or poor monetary policy records (that is, countries with central banks that would be described by Orphanides, 2010: 14, as 'institutionally challenged'). It turns out that the results hinge importantly on the choice of the 'control group' which is used for comparison (see, in particular, Mishkin and Schmidt-Hebbel, 2007). The majority view is that IT indeed helps deliver low inflation – see, for example, Roger (2010), Schmidt-Hebbel (2010) and Pétursson (2010) – but there are some observers who remain unconvinced, notably Ball and Sheridan (2005) and Filardo and Genberg (2010). There is no clear evidence that IT has negative consequences for growth or employment.

It is conventional to identify a list of 'preconditions' which countries should fulfil before they adopt inflation targeting. Bracke et al. (2011), for example, distinguish between economic, institutional and technical conditions. Under the former, a country must have a flexible exchange rate, so that monetary policy can focus on inflation; monetary policy should be free from fiscal dominance in the form of a requirement to fund budget deficits which makes monetary growth subject to fiscal policy decisions; there needs to be a sound and well developed financial system (which involves, among other things, well capitalised banks with low rates of non-performing loans, a significant bond market, and a money market that facilitates the passing through of the central bank's interest rate to the commercial banks'

interest rates); and there must be an effective monetary transmission mechanism from the interest rate(s) that the central bank controls to aggregate demand and inflation.

The principal institutional conditions pertain to the governance of the central bank, which should be both adequately independent from its government and accountable for its policy actions to the government and/or the wider public. The technical conditions include the requirement that the central bank should have the expertise necessary for forecasting the impact on output and inflation of alternative policy measures, and that it should have the ability to communicate its monetary policy strategy and individual monetary decisions effectively to the public.

However, although these preconditions have been heavily emphasised in the literature, it is in fact not clear that countries adopting IT have typically fulfilled all of them in advance. Amato and Gerlach (2002), for example, indicate that at the date of adoption of IT a number of countries had much larger fiscal deficits than would be consistent with sound government finances. Batini and Laxton (2007) show that emerging market inflation targeters typically did not satisfy (their version of) the preconditions before adopting IT; on the other hand they moved much closer to 'best practice' on many of the 24 indicators used in the period following adoption of IT.

While some of these preconditions may be left to be fulfilled in due course, countries adopting IT have to address at once a number of issues, some technical and some rather broader. On the technical side they need to decide what price index to use in their inflation targets; what rate of inflation should be the target; for what time horizon should the target be set; and what, if any, exemptions should be specified, that is, contingencies for which it would be regarded as acceptable to miss the target. Roger (2010) reports that IT countries have converged on a standard set of specifications. Most countries target the growth over twelve months of a headline consumer price index (CPI), rather than a measure of core inflation: the former measure has the advantages that it is typically better known and understood and it tracks more accurately the cost of living, but hitting a CPI target may be more problematic if food items (whose prices are determined in world markets) and regulated goods (which are affected by political decisions outside the central bank's control) have large weights in the index. Steady state inflation targets are typically around 2–3%, though sometimes a declining path from a higher initial rate has been specified. In the latter case the time horizon may refer to specific years, but in the steady state inflation

targets tend to be open ended or indefinite. Some central banks had exemption clauses in the early days of IT, but these have now disappeared.[3]

There are two key broader issues that countries adopting IT need to consider. The first is the role of asset prices, notably house prices and stock market prices. The conventional view, as articulated by Bernanke and Gertler (1999, 2001), has been that monetary policy should not attempt to act against asset price booms but should simply soften the impact of any ensuing bust. Since the Great Moderation ended in the financial crisis of 2007–9, this view has come under criticism, particularly from those like Cecchetti et al. (2000) who had previously proposed that policy should 'lean against the wind' of asset price rises, in order to moderate any boom as it developed (rather than prick the bubble once it had developed) (see Wadhwani, 2008, for a return to the issue). Nevertheless, the majority view continues to be to resist such policies. In emerging markets, where the data on house prices may be less good and stock markets may be more volatile than in industrial countries, leaning against the wind might be more difficult to implement, but it might also hold out larger potential benefits.

Whether central banks adopt some element of leaning against the wind or not in their monetary policies, however, it is clear that they will be expected to play a larger role in safeguarding financial stability, both as banking supervisors and as important contributors to decision-making on the macro-prudential regulations (e.g. varying capital adequacy requirements) which are being widely considered. This means that IT can no longer be presented as a simple answer to the 'assignment problem', in which the central bank uses its single instrument, the interest rate, to pursue its single target, inflation.

The second broader issue is that of exchange rate flexibility. Industrial country inflation targeters typically do not intervene at all in forex markets, arguing that all they need to do is to take proper account of the consequences of exchange rate movements for inflation. And in the period of (formal and informal) IT the exchange rate prices pass-through seems to have been much lower than in the 1970s and 1980s (see, for example, Taylor, 2000). However, it can be argued that emerging market inflation targeters face a different situation (Amato and Gerlach, 2002): the exchange rate for their currencies may be more volatile, agents are accustomed to using an exchange rate peg as the basis for their inflation expectations, and domestic banks and firms may have significant foreign exchange liabilities such that exchange rate movements can have large adverse effects on their balance sheets. In other

words the 'fear of floating' first identified by Calvo and Reinhart (2002) may not be entirely misplaced. For example, Al-Mashat (2011) presents a New Keynesian model, calibrated for Egypt, within which she examines the effect on inflation and output volatility of varying degrees of responsiveness by the central bank to exchange rate movements. Her results enable her to argue that the optimal policy is towards the complete exchange rate flexibility end of the spectrum, but not quite at the end. In practice a number of IT-adopting countries initially maintained an exchange rate peg (often a crawling peg) in parallel to their inflation targets in the early years of IT, but then discarded the peg once they had reached steady state inflation. However, there is some evidence that at least some IT countries have intervened more heavily in the forex market during the crisis years, presumably in response to the greater volatility of exchange rates and the dangers this posed for their domestic inflation rates (and maybe economic growth).[4]

The emerging market countries which have already adopted IT are mainly in Latin America, Asia and Central and Eastern Europe, but they also include South Africa and Indonesia. In the Middle East and North Africa, Turkey adopted inflation targeting informally in 2002 and formally in 2006, so far with relatively satisfactory results. Egypt has announced its intention to adopt IT but has not set a date. Morocco and Tunisia have also shown interest but have not set dates.

* * * * *

This volume presents a coherent set of papers on the (possible) introduction of IT in the MENA region. Part I covers the issues and challenges, while Part II consists of country-specific studies. Thierry Bracke (Chapter 2) focuses on the standard precondition for IT that there needs to be sufficient financial development: sufficient depth of financial markets for the central bank to affect the economy via its own policy rate, and sufficient stability for monetary policy not to be constrained by concerns about financial sector weakness. His empirical assessment of the three IT-contemplating MENA countries – Egypt, Morocco and Tunisia – with respect to these criteria suggests that progress is being made. However, he stresses the bank-based nature of their financial systems, the relative underdevelopment of capital markets and the structural liquidity surplus of the banks, on the one hand; and the high level of non-performing loans (although the banks are relatively well capitalised and profitable), on the other.

Michael Sturm and François Gurtner (Chapter 3) consider issues of fiscal policy and macroeconomic stability for a larger sample of

Mediterranean countries, distinguishing between oil exporters and other countries (and providing some comparisons with the oil exporters of the Gulf). As they explain, large and persistent government budget deficits can constrain monetary policy directly by pressure on the central bank to finance them, but they can also affect macro policy in other ways, by pressure on interest rates and aggregate demand and by effects on financial market expectations. The countries covered have shown some improvement in fiscal imbalances – deficit and debt ratios – over the last decade (oil exporters more than others), but substantial imbalances remain, and the authors argue that countries need to reform their public finances, introduce more effective budget management and transparency, and eventually adopt standard fiscal rules. In addition, central banks need to have the independence to be able to refuse to provide finance to governments. Of the three IT-contemplating countries, Morocco and Tunisia look somewhat better on many indicators, while Egypt's fiscal position remains weak.

Mahmoud Sami Nabi and Ndiamé Diop (Chapter 4) use the example of Tunisia to analyse the relationship between the degree of capital account liberalisation and the optimal monetary policy rule. After explaining the moves made and planned in Tunis towards greater capital account liberalisation, together with the tabled adoption of IT, they present and calibrate a version of Ball's (1999) model of monetary policy. In their version of this model (which Ball used to provide a rationale for policy to react to the exchange rate as well as to inflation and output) they allow for varying degrees of capital mobility, and they contrast a 'pure' IT strategy with an 'adjusted' IT strategy in which policy reacts only to inflation net of the direct but temporary effects of exchange rate changes. Under this second strategy, which they argue is more suitable for a developing country like Tunisia, lower capital mobility (resulting from less or slower capital account liberalisation) is preferable because it means lower exchange rate volatility. They also analyse how the optimal speed of disinflation varies with the degree of capital mobility, depending on the relative weights on output and inflation.

Simon Neaime (Chapter 5) uses vector autoregressions (VARs) and impulse response functions (IRFs) to investigate the monetary transmission process in six MENA countries (the three IT-contemplators plus Lebanon, Jordan and Turkey, which has already adopted IT). For each country he estimates the same simple model with four variables: output, inflation, interest rate and exchange rate. The results include the finding that the exchange rate is the dominant transmission mechanism in Egypt and Turkey, but the interest rate is dominant in Jordan, Lebanon,

Morocco and Tunisia. Neaime argues that these countries should abandon fixed exchange rates in favour of independent monetary policies operated by independent central banks.

Adel Boughrara and Samir Ghazouani (Chapter 6) use micro data to examine the bank lending channel of monetary transmission in Egypt, Jordan, Morocco and Tunisia. In particular, they are concerned with whether individual banks' size, capitalisation and liquidity affect their responses to changes in monetary policy. What they find is significant evidence of a bank lending channel in Jordan, Morocco and Tunisia, with capitalisation and size influencing banks' responses in Jordan, size in Tunisia and liquidity in Morocco. For Egypt, on the other hand, the evidence is much weaker, with size and liquidity apparently playing no role and capitalisation playing an unexpected role (with a perverse sign).

Part II focuses on individual countries which have adopted or are thinking seriously of adopting inflation targeting. David Cobham (Chapter 7) provides some background with an examination of the evolution of monetary policy in Europe over the last four decades – from fixed exchange rates under Bretton Woods in the 1950s and 1960s via monetary targets in the 1970s and exchange rate targets in the European Monetary System in the 1980s and 1990s – together with the accompanying changes to the financial infrastructure. He highlights the changes in money and bond markets, in France and Italy in particular, which were necessary for what he calls the 'monetary architecture' in Europe to be developed to the point where (formal or informal) inflation targeting could be operated in the 2000s through interest rates and transmitted through the money market, by independent central banks, in a context where the bond market allows for non-monetary financing of budget deficits and so insulates monetary from fiscal policy. He also emphasises the costs involved in establishing and operating these money and bond markets, and suggests that the financial crisis has shown that IT is not necessarily the end of the road for the development of monetary policy strategy in industrial countries (particularly because of the argument that monetary policy should react to asset prices in a way that would move policy away from pure IT) or, indeed, in developing and emerging countries.

Hasan Ersel and Fatih Özatay (Chapter 8) discuss the transition to IT in Turkey and the outcome so far, in the context of the development of financial markets and institutions. They start by reviewing the ups and downs of monetary policy and the real economy in the 1980s and 1990s, when Turkey tried a variety of monetary and exchange rate

targets in a context of recurring fiscal dominance, which contributed to repeated financial and exchange rate crises. The crisis of 2001 led to a reform programme which included much stricter fiscal discipline, banking sector reform and the adoption of 'implicit' inflation targeting, which included elements of monetary targeting (with the central bank specifying that it would move to full IT as soon as that became possible). They discuss the implementation of monetary policy, the transmission mechanisms and the exchange rate regime, before analysing the adoption of fully fledged IT in 2006, and the outcome over the global financial crisis. In conclusion they underline the difficult issues of exchange rates and competitiveness, on the one hand, and asset price bubbles and financial stability, on the other.

Rania Al-Mashat (Chapter 9) considers the case of Egypt. She starts with an overview of the evolution of Egyptian monetary policy over recent decades, from a predominance of direct controls in the 1970s and 1980s, through the gradual shift to indirect monetary policy tools under the structural adjustment programme in the 1990s, to the period following the floating of the Egyptian pound in 2003 and the implementation of banking sector reform. Her analysis emphasises the importance of monetary growth in driving inflation, which varied significantly over these periods. She then considers how ready Egypt is for IT, partly through a series of comparisons between Egypt and other countries which have adopted IT (for the years just before they did so), in the areas of macroeconomic stability, central bank governance, monetary policy operating targets and instruments, banking sector soundness, fiscal imbalances, monetary policy transparency and data availability. She concludes that Egypt has introduced relevant changes in a number of areas, but there remain major issues to address on fiscal policy and the macroeconomic database.

Mongi Boughzala and Hassouna Moussa (Chapter 10) examine developments in Tunisia. They present a review of the conduct of monetary policy in recent decades, culminating in what they call Tunisia's 'gradual transition to a more flexible and more coherent regime'. They then ask whether Tunisia is in fact moving towards or away from IT, looking in turn at the financial system, the fiscal position, exchange rate flexibility (and the fear of floating both exchange and interest rates), the governance of the Tunisian central bank and financial liberalisation; they also emphasise the lack of a clear and irrevocable commitment by the Tunisian authorities to the adoption of IT. This is followed by a discussion of whether it would be better

to move to full IT or to some more hybrid and flexible framework, with reference to a range of post-crisis papers. They conclude that, although Tunisia has met some of the preconditions and is on course to meet others, it is probably not moving towards full IT and in any case it should not do so.

Finally, Lahcen Achy and Adel Boughrara (Chapter 11) consider the movement towards IT in Morocco. They provide a comprehensive account of the changes in monetary policy and financial institutions over the last few decades, during which Morocco has moved from fiscal dominance and credit controls through interest rate and credit liberalisation to a situation where it can seriously contemplate the adoption of IT. They give a detailed account of the developments at the central bank over this period, which include major improvements in technical expertise and capacity. They examine the extent to which Morocco fulfils the institutional, economic and technical preconditions for IT, identifying the relative underdevelopment of equity and bond markets, on the one hand, and policymakers' fear of floating, on the other, as the main shortcomings. An analysis of the shocks affecting the Moroccan economy finds negative supply shocks to be particularly important, and this leads into a discussion of the problems of supply shocks under IT, where the emphasis on price stability makes these shocks particularly difficult to handle. Achy and Boughrara conclude that Morocco is now in a position where it could relatively easily adopt IT, but that it is not obvious that it would be in its interest to do so.

* * * * *

What comes out of all this is a very mixed picture. While Turkey has introduced inflation targeting with some success, the three other MENA countries which have shown interest in IT are still a long way from adoption – particularly Egypt and Tunisia. A number of the standard preconditions remain unmet, and it is not clear that they will or could be met in the near future. At the same time, their governments have not demonstrated an irrevocable commitment to IT. In particular, they have not set firm dates for IT to start, they have not given their central banks significant independence and they have not allowed genuine exchange rate flexibility (presumably because of the 'fear of floating').

However, the world financial crisis and recession have raised questions about the optimality of IT and in particular its suitability for

emerging and developing countries, questions which are posed and discussed in a number of the papers here. A key issue for industrial countries is whether monetary policy should respond in some way to asset prices. Additional issues for developing and emerging countries concern the risks of allowing full exchange rate flexibility, and the apparently greater importance in these countries of supply shocks, which cannot be handled easily under IT.

The 'unfinished journey' of our title is one which may be completed in due course, or one which may never be completed. What this book suggests is that even for the MENA countries which have talked about adopting IT completion is unlikely to occur over the next five or even ten years, partly for 'bad' reasons (e.g. irrational fear of floating, refusal to grant central bank independence) but partly also for good reasons: IT as conceived and operated so far in industrial countries may no longer be the optimal strategy for those countries, and it may well not be the most effective monetary policy framework for MENA countries.

Notes

1. Israel is sometimes counted as a MENA country, but often not. Although it adopted IT in the 1990s, its economy is very different from that of other MENA countries and we do not consider it here.
2. For a systematic comparison between monetary, exchange rate, nominal income and inflation targets see Cobham (2002, chapter 1).
3. See Almeida and Goodhart (1998) for discussion of IT frameworks in the 1990s, and Hammond (2010) for a summary of recent IT specifications.
4. See Stone et al. (2009), Sturm and Sauter (2010).

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Part I
Issues and Challenges

2

Moving towards Domestic Monetary Policy Anchors – Are Financial Markets Ready in the Mediterranean Region?

Thierry Bracke

2.1 Introduction

Most central banks in the MENA region have over recent years and decades pursued monetary policy strategies based on external anchors. The exchange rate acts as a nominal anchor for monetary policy across most of the Mediterranean region and in all of the Gulf countries. That said, some central banks are gradually abandoning their exchange rate targets and moving towards – or considering a move towards – domestic monetary policy anchors. The central banks of Israel and Turkey follow an inflation targeting (IT) approach already, while the central banks of Egypt, Morocco and Tunisia have taken steps to prepare for the gradual adoption of such an approach.

In answering the overarching question of this book – whether IT is a suitable monetary strategy for MENA countries – this chapter examines one specific precondition for IT, notably the existence of deep, sound and stable financial markets.[1] The chapter argues that a critical mass of financial depth and stability is crucial to ensure a successful shift towards more autonomous monetary policy frameworks. Specifically, financial deepening is needed for effective monetary policy transmission, and financial stability is important to minimise potential conflicts between monetary policy and financial stability objectives.

The chapter starts with a review of the findings of earlier literature on the importance of financial depth and soundness for IT (Section 2.2), before turning to a systematic review of the current state of financial depth and financial stability in selected MENA economies. Section 2.3 describes overall financial structures in MENA countries, distinguishing banking and non-banking sectors, and discusses the relative situation of Egypt, Morocco and Tunisia in the broader regional context. Section 2.4 provides a brief analysis of key financial stability challenges in MENA countries, again with a main focus on Egypt, Morocco and Tunisia. Section 2.5 concludes.

2.2 Why does financial depth and soundness matter for inflation targeting?

A safe and sound financial system is widely seen as a necessary condition for the success of an IT regime. Most authors make this point in the context of the debate on complementarities and conflicts between price stability and financial stability (see, for instance, Mishkin, 2004). Beyond this policy trade-off, financial depth and soundness matter for the central bank's operational capacity and for monetary policy transmission. Without developed financial markets, monetary policy transmission is hardly possible. This section lays out these considerations, based on the available theoretical and empirical literature, and starting from the operational aspects of monetary policy implementation before turning to the complementarity between price and financial stability. The section ends with a brief discussion of the endogeneity of these conditions in the context of IT.

Financial depth and monetary policy implementation and transmission

A shift to IT typically involves a phasing out of direct administrative regulations (such as credit ceilings or selective refinancing) and an increasing role of open market operations, whereby central bank interest rate changes become the main or even exclusive operational instrument of monetary policy. A precondition for such a shift towards market-based monetary policy instruments is a sufficient degree of financial depth.

A distinction should be made between the banking sector and the non-banking sector:

- The *banking sector* is clearly crucial for monetary policy transmission. The textbook treatment of the main transmission channels, including the traditional interest rate channel, assigns a primary role to banks, as changes in monetary policy rates directly affect money market

interest rates and indirectly influence the lending and deposit rates set by commercial banks to households and firms. This interest rate channel can only operate if there is a functioning money market that acts as a main channel of liquidity transmission among commercial banks.[2] In addition, it requires that commercial banks' lending and deposit rates have an impact on the overall economy, which will hinge on the size, depth and distribution of lending and deposit markets.

- The *non-bank financial sector* is of secondary importance to the banking sector, but it can play an important complementary role in strengthening monetary policy frameworks. Deep and well functioning equity markets reinforce monetary policy transmission through asset price channels. An efficient foreign exchange market will be important in an IT environment where exchange rate developments are driven by market forces. Finally, well functioning bond markets – including government bond markets – matter for monetary policy as they provide an alternative to bank-based government financing and thereby reduce the risk of crowding-out effects from fiscal policy.

Some of these points are underscored in empirical examinations of monetary policy transmission in MENA economies. One example is provided by Al-Mashat and Billmeier (2008), who examine the transmission channels in the Egyptian economy and find that, while the exchange rate channel is strong, most other channels (interest rates, bank lending and asset prices) are rather weak, despite some improvement over time. They note that further financial deepening can enhance these transmission channels in the future, through increased competition among banks, reduced financing of the public sector and the development of new market segments such as mortgage markets, thereby paving the way for a gradual shift towards IT.

In addition to financial depth, the structure of financial markets matters for monetary policy. One aspect that tends to be overlooked in the literature relates to the liquidity situation in the banking sector. Across several emerging market economies, and in most MENA economies, the banking sector is characterised by abundant liquidity mainly as a result of excess balance of payments inflows and a concomitant build-up of foreign exchange reserves. The implications of a liquidity surplus situation are analysed inter alia by Agénor and El Aynaoui (2010) and by Löffler et al. (2010). The former look at the Moroccan case, where abundant liquidity held by commercial banks *de facto* reduces the role of the central bank as a market maker in the money market. They develop a model showing that commercial bank behaviour under excess liquidity may impede the ability of monetary policy to influence inflation.[3] The latter assess prac-

tices across a range of emerging market economies and point out that the existence of a liquidity surplus forces central banks to engage in costly liquidity-absorption operations, which may lead to a certain welfare loss.

The relation between financial stability and price stability

Policy considerations suggest that financial stability is crucial for monetary policy to remain successfully anchored to price stability. Most authors find that price stability helps promote financial stability (Bordo and Wheelock, 1998), some even arguing that it is an almost sufficient condition for financial stability, to the point that dedicated financial stability policies may not be needed as long as inflation is kept under control (Schwartz, 1995).

The point has been made in particular for emerging market economies, where past episodes of financial instability were often caused by, or at least preceded by, bouts of high inflation.[4] Bordo et al. (2000), Calomiris and Gorton (1991) and Mishkin (2004), among others, find that banking sector weaknesses may prevent central banks in emerging market and developing economies from raising policy rates if inflation targets are in danger of being missed, because higher interest rates would aggravate these weaknesses. In some past episodes, monetary policy tightening therefore led to a loss of credibility in the banking sector with ultimately negative repercussions on central bank credibility.

Also in the specific case of MENA economies, financial sector fragilities have been identified as a potential obstacle to fully fledged IT. In particular, concerns about credit quality and the (over time improved but overall still high) stock of non-performing loans are seen as limiting the room for manoeuvre of monetary policy. Drawing on an empirical examination of the Egyptian case, Al-Mashat and Billmeier (2008) argue that a clean-up of remaining non-performing loans in the banking sector will be a key element in strengthening monetary policy. Boughrara et al. (2009) review financial stability issues in Tunisia and conclude that a deep transformation of the rules of the game within the financial system is a necessity for the success of inflation targeting or any other sound monetary policy.

Are financial depth and soundness really needed for inflation targeting?

There is a long-standing academic and policy debate as to whether preconditions have to be met before IT is introduced. While there is a consensus that preconditions may provide important guideposts to assess readiness for IT, some authors have advanced two cave-

ats: 1) preconditions are not specific to inflation targeters and 2) preconditions can be fulfilled endogenously, that is, their fulfilment can be enhanced by the establishment of IT in itself (see, for instance, Amato and Gerlach, 2000). Do these caveats also apply to the financial preconditions in terms of deep and sound financial markets?

The first caveat certainly does apply. Deep and sound financial markets are important for any systematic monetary policy framework that shifts away from direct administrative measures towards a greater reliance on market-based policies. Whether the policy target is set in terms of an inflation objective (IT), a definition of price stability (the case of the ECB) or a combination of price and other economic objectives, effective monetary policy transmission will always be important, and will depend critically on the overall state of financial development.

The second caveat is not so relevant. The endogeneity argument builds on the notion that the adoption of an IT framework in itself may act as a commitment device, strengthening the institutional underpinning and credibility of the central bank, and fostering structural and fiscal reforms (Bernanke et al., 1999, and IMF, 2006). However, this endogeneity argument is less relevant when it comes to financial sector deepening, as improved central bank credibility will not be sufficient to resolve banking sector weaknesses. Therefore, it is definitely preferable to advance as much as possible with regard to financial deepening and stabilisation before engaging in IT.[5]

2.3 Financial structures in MENA countries

The banking sector in MENA countries

Financial sectors in the MENA region are typically bank-based. In most countries, the banking sector has expanded steadily over recent years and bank asset growth has continuously outpaced nominal GDP growth. Two simple measures of financial depth are shown in Figure 2.1a, which plots the ratio of bank assets to GDP (horizontal axis) against the ratio of broad money to GDP (vertical axis) for a selected group of countries on the Mediterranean shore and in the Gulf region.

The distance from the origin in the figure provides a general gauge of the degree of financial development in the MENA region. Nearly all countries exhibit a meaningful level of financial development, with bank assets and broad money ranging mostly between 50% and 150% of GDP. These figures are certainly lower than in advanced economies such as the euro area (shown for comparison purposes) even though there are exceptions in the form of countries with remarkably large

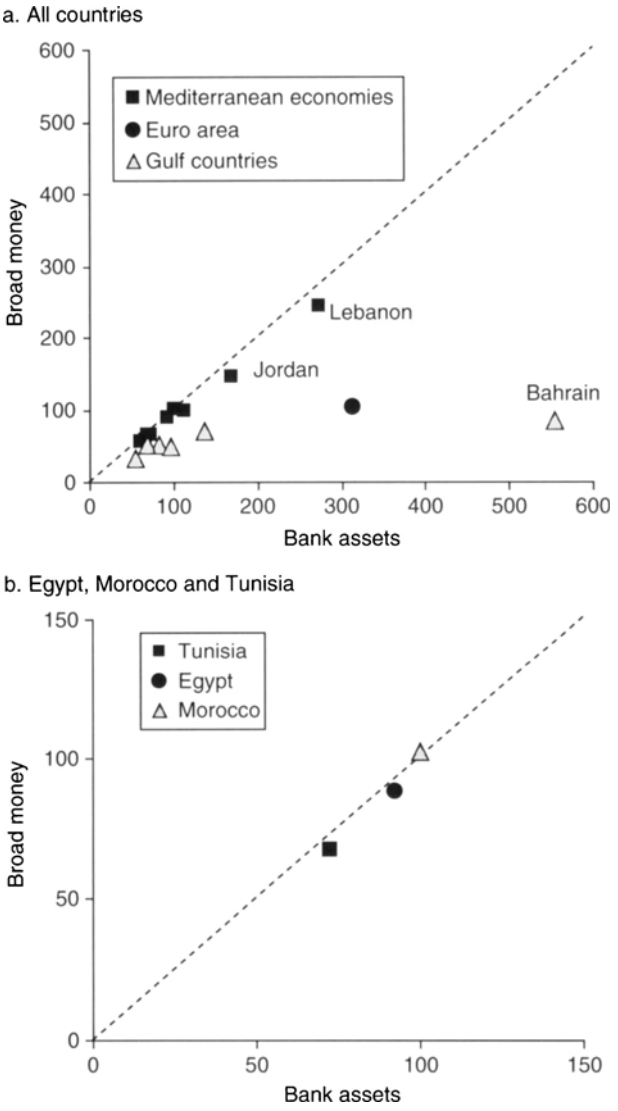

Figure 2.1 Total bank assets versus broad money (percentage of GDP, 2008 or 2009)

Note: Mediterranean countries are Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Syria and Tunisia. Gulf countries are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates. Data as of 2009 for Mediterranean countries and as of 2008 for Gulf countries.

Source: IMF, own calculations.

banking sectors, in particular Bahrain, Lebanon and Jordan. The strong role of banks in these countries reflects largely idiosyncratic factors, such as the development of financial centres (Bahrain and Lebanon), the role of banks in the financing of high public deficits (Lebanon) and the strong deposit growth from the diaspora (Lebanon).

Banks in MENA economies usually pursue relatively conventional business models. This can be seen by comparing banking sector assets with broad money: if the amount of total banking sector assets is close to broad money, this suggests a limited diversification of banking sector funding sources away from conventional deposits. For the Mediterranean countries, total bank assets and total money are of similar magnitudes (points close to the 45-degree line), reflecting the largely deposit-based funding sources of local banking sectors. Banking sector funding is slightly more diversified in the Gulf countries, in particular (but not only) in Bahrain, where other funding sources – including foreign funding and market-based funding – play a more pronounced role.[6]

In Egypt, Morocco and Tunisia, more specifically, banking sectors share the broad characteristics of the wider region. Bank assets are in the middle range from a regional perspective, reaching a share of GDP of around 100% in Morocco and 90% in Egypt, while being somewhat lower in Tunisia (below 70%) (Figure 2.1b). In all three countries, broad money is very close to total bank assets, suggesting that bank deposits constitute the main source of bank funding.

What does this cursory data on financial development suggest for monetary policy transmission? A priori, the level of development of the banking sector appears sufficient to ensure effective monetary policy transmission. Nevertheless, these quantitative indicators should be balanced against some more qualitative aspects of financial deepening.

First, interbank markets in the MENA region are relatively underdeveloped and play a marginal role in transferring liquidity across the banking sector. Most banks in the MENA region operate with ample liquidity buffers, reflecting partly their conservative business strategies, partly also the macroeconomic environment (see below for a more detailed explanation of the situation of structural excess liquidity in the banking sector). Moreover, market infrastructure for interbank operations – including real-time gross settlement payment systems and relevant market instruments such as collateralised loans – is still in its infancy across most of the region. As a result, interbank markets do not offer a natural starting point for an even and smooth transmission of monetary policy decisions throughout the banking sector.[7]

Second, loan activities of the banking sector tend to be dominated by credit to the public sector. Domestic banking sectors play a key role in

channelling domestic savings to finance public deficits and debt. This is shown in Figure 2.2a, which compares bank credit to the private sector (horizontal axis) with credit to the public sector (vertical axis), both expressed as a share of GDP. In a majority of MENA countries, credit to the public sector exceeds or is close to credit to the private sector, thereby reducing the role of the banking sector in channelling available savings to the private sector. This reduces the effectiveness of monetary policy transmission as it reduces the impact of bank lending rates on private sector balance sheets and on aggregate demand and supply. In Morocco and Tunisia, and to a lesser extent in Egypt, the predominance of public sector financing is less pronounced, and credit to the private sector is comparatively more developed, following some years of relative fiscal prudence and a more buoyant expansion of credit to the private sector (Figure 2.2b). A renewed widening of fiscal imbalances since 2008 in response to the global crisis may nevertheless jeopardise some of these achievements and give rise to renewed concerns about a crowding-out of private sector financing.[8]

Third, levels of bank penetration remain limited across most MENA economies. Access to banks in the corporate sector remains mostly confined to large (and partly state-owned) companies, and small and medium-sized enterprises have difficulty in accessing financial services, a difficulty inter alia also due to information frictions (e.g. lack of credit history, underdeveloped or absent credit registers, limited disclosure of financial information by firms) (see, for example, IMF, 2010). In some countries, access to financial services also tends to be uneven across business sectors, with some sectors (e.g. construction, mineral extraction) receiving the bulk of bank loans. For the household sector, access to banking services is limited, reflecting a skewed income and wealth distribution, a limited development of ATMs and small networks of branches. All of these factors may limit the effectiveness of monetary policy transmission.

Fourth, the currency denomination of bank loans may have an impact on monetary policy transmission, as central bank rates in domestic currency have a limited transmission in heavily dollarised financial systems. This factor is, however, of limited importance across the MENA region, as dollarisation is usually relatively low, with a few exceptions such as Lebanon, where foreign currency loans constituted around 80% of total loans as of early 2010. Among the three countries that intend to move towards IT, dollarisation is of some relevance only in Egypt, where around 25% of bank loans were denominated in foreign currency as of early 2010.[9]

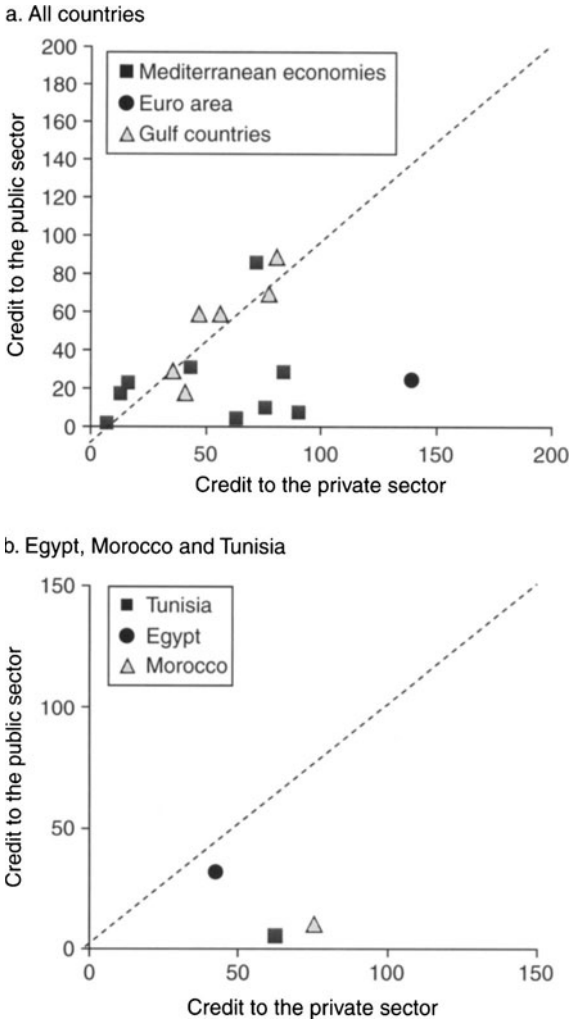

Figure 2.2 Credit to the private and the public sector (percentage of GDP, 2008)

Note: Mediterranean countries are Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Syria and Tunisia. Gulf countries are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates.

Source: IMF, own calculations.

The structural liquidity situation

One key parameter for the design of monetary policy is the liquidity situation in the banking sector, that is, the existence of a structural liquidity surplus or deficit. In the textbook case of contemporaneous central banking, and in the daily practice of central banks of most advanced economies, banking systems operate under a structural liquidity shortage. Central banks, as sole issuers of banknotes and bank reserves, are monopoly suppliers of the monetary base and can hence steer short-term money market rates through liquidity-providing operations in the money market (ECB, 2004). Most textbook treatments of IT do not discuss operational issues at great length, and implicitly assume a situation of liquidity shortage in their treatment of the role of central bank policy rates.

In MENA countries, however, the textbook setting of a structural liquidity shortage usually does not apply, as documented in a regional overview of liquidity situations by Schnabl and Schobert (2009).[10] Demand for liquidity (which tends to be high due to a relatively widespread circulation of banknotes) is usually more than offset by an even higher supply of liquidity stemming from large inflows of foreign capital and an associated foreign exchange reserve accumulation. As a result, the banking sector operates in a context of excess net liquidity, and the central bank is not in the position of a monopoly supplier of liquidity.

To illustrate this more precisely, it is useful to introduce the concept of autonomous liquidity factors. These factors capture liquidity demand and supply in the banking sector beyond the direct control of the central bank, and include: 1) banknotes, which are a source of liquidity demand, 2) net government deposits with the central bank, also a source of liquidity demand, and 3) net foreign assets, which are a source of liquidity supply and enter into the computation of autonomous factors with a negative sign. If the sum of the autonomous factors is negative, the banking sector operates under excess liquidity and is not dependent on central bank liquidity provision.

Such a situation of excess liquidity exists in Egypt, Morocco and Tunisia. In all three countries, liquidity demand arising from the issuance of banknotes (dark bars in Figure 2.3) is more than offset by the liquidity supply stemming from the large stock of net foreign assets (light bars), and hence net liquidity demand is negative, or in other words net liquidity supply is positive (thick lines).[11] This excess liquidity has largely persisted over the period 2007–9, even though there was

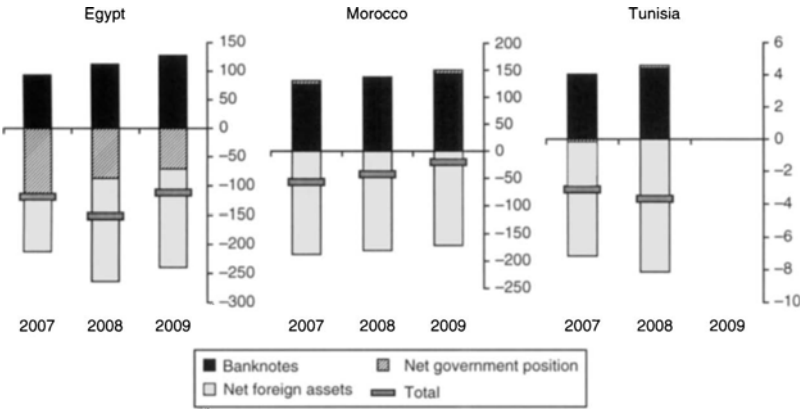

Figure 2.3 Main autonomous factors of liquidity demand (in billion national currency, + = source of liquidity demand, end of reporting period)

Note: Data are for end-December for Tunisia and Morocco, for end-June for Egypt.

Source: Central bank annual reports, own calculations.

a noticeable decline in the liquidity situation of the Moroccan banking sector due to continued high demand for banknotes coupled with some decline in foreign exchange reserves.

While a liquidity surplus situation does not put central banks in a naturally strong position as monopoly liquidity supplier, monetary policy (and IT) is still possible. Indeed, structural excess liquidity situations appear in many emerging market economies, including in countries with IT regimes (e.g. Israel and Turkey, as well as most inflation targeters in Central and Eastern Europe).[12] To deal with that, central banks implement liquidity-absorption instruments such as setting reserve requirements, auctioning deposits, conducting reverse repurchase operations, or issuing central bank certificates of deposit or central bank notes. Even though central bank operations may be technically feasible in such an environment, their efficiency and effectiveness remains controversial, inter alia due to possible asymmetric behaviour of commercial banks (Agénor and El Aynaoui, 2010) or to the relatively high costs of liquidity-absorption operations (Löffler et al., 2010). Hence, the existence of a structural liquidity surplus may put central banks at a disadvantage in moving towards IT.

The development of asset markets

In advanced economies, asset markets play an important complementary role in monetary policy transmission as interest rate changes may

impact on asset prices (exchange rates and equity prices) and thus induce shifts in aggregate demand and supply or wealth effects. In MENA economies, the importance of asset markets is very different across individual countries.

Equity markets exist in most MENA countries, and stock market capitalisation is reasonably high. Figure 2.4 plots bank assets (horizontal axis) against stock market capitalisation (vertical axis), both expressed as a percentage of GDP. Generally, stock market capitalisation was below the level of bank assets as of 2008, but still in a range of 30–100% in most economies.[13] Among the three countries under closer examination in this chapter, stock market capitalisation appeared lowest in Tunisia, where it stood at 16% of GDP as of end-2008, compared with 46% in Egypt and 72% in Morocco. Access of firms to stock markets is relatively limited, even though in the cases of Morocco and Tunisia the number of listed companies has increased gradually over recent years.[14] Moreover, equity tends to be held by a small number of shareholders and turnover is limited in comparison with advanced economies or major emerging market economies, thereby limiting the potential wealth effects that may arise from stock market fluctuations.[15]

Foreign exchange markets are relatively underdeveloped in the MENA region, due to prevailing exchange restrictions, limited exchange rate flexibility in most countries, and the heavy role of central banks in controlling supply and demand for foreign exchange. The respective roles of the central bank and private market participants are illustrated in Figure 2.5 for the case of Morocco, one of the MENA countries with the most developed and active foreign exchange markets. Private bank activity grew steadily in those markets from the early 2000s onward, but this trend came to a halt as a result of the crisis in 2007–8, and by 2009 roughly half of all foreign exchange transactions (measured by volume) were conducted by the central bank.

Finally, as regards securities markets, most MENA countries have relatively well developed local bond markets, at least for government securities. In Egypt, a majority of government debt is issued in the form of government securities, with an outstanding amount above 60% of GDP at the end of fiscal year 2008/2009. However, only a part of these securities is freely tradable on the exchange market, as around half of the outstanding stock is held by the Social Insurance Fund and the Central Bank of Egypt.[16] In Morocco, government securities markets are well developed, as nearly all public debt is securitised and negotiable, with maturities extending up to 30 years.[17] In Tunisia, around 60% of outstanding domestic public debt as of end-2009 was issued in the form

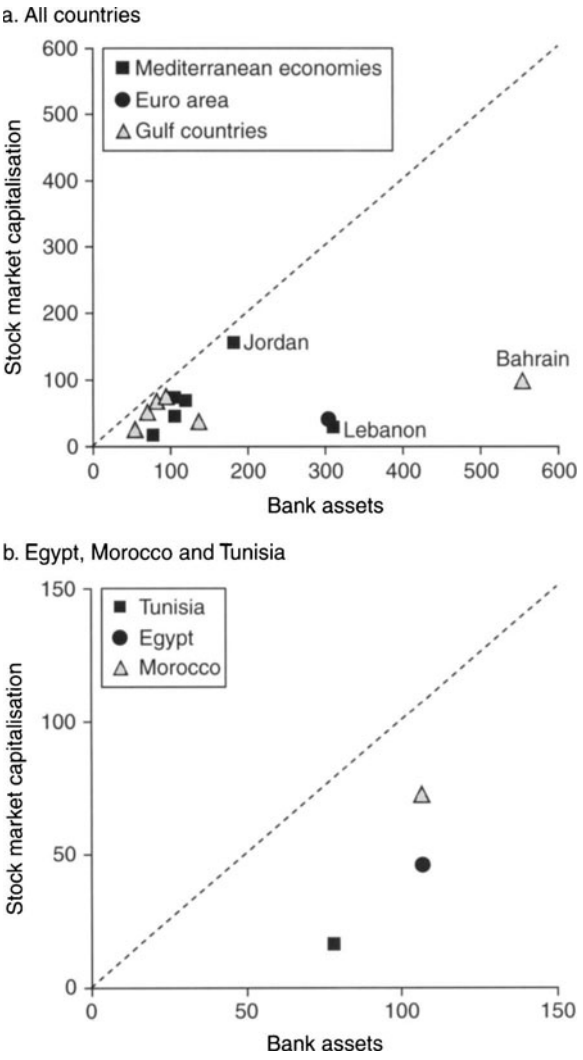

Figure 2.4 Depth of the banking sector versus depth of stock markets (total bank assets and total stock market capitalisation, percentages of GDP, 2008)

Note: Mediterranean countries are Egypt, Israel, Jordan, Lebanon, Morocco and Tunisia. Gulf countries are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates.

Source: IMF, S&P Global Stock Markets Factbook 2009, own calculations.

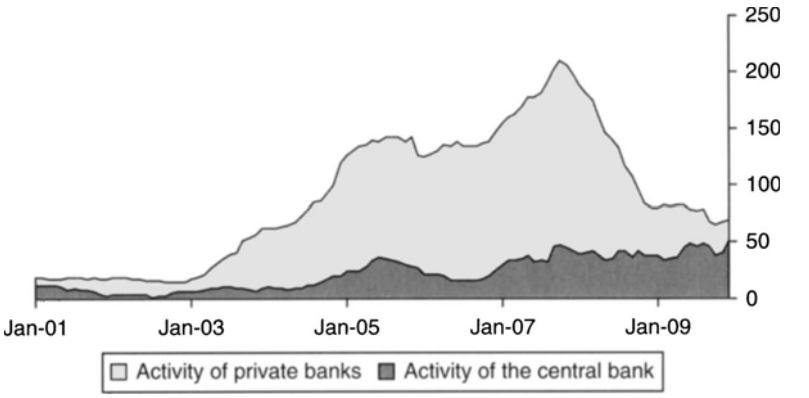

Figure 2.5 Foreign exchange market turnover in Morocco (millions of dirhams, 12-month cumulated data, 2001–9)

Source: Bank al-Maghrib.

of securities, which are issued through regular auctions, largely held by domestic banks and actively traded in the secondary market.[18] All in all, the relatively well developed government securities markets in Egypt, Morocco and Tunisia are important for monetary policy in two ways. First, they offer an alternative to government financing directly from banks, and thereby provide a mechanism for insulating monetary growth from fiscal deficits (Cobham, 2011). Second, the secondary market of government securities – in particular government bills with maturities up to one year – can be an important channel of liquidity transmission within the banking sector.

2.4 Financial stability in MENA countries

Financial stability matters for monetary policy, as well as financial depth. As explained in Section 2.2, empirical reviews of emerging market and developing countries' experiences reveal that weak banking sectors may limit the room for manoeuvre of monetary policy, in particular in circumstances where monetary tightening is needed to counter inflationary pressures. Such tightening may exacerbate credit risks as interest rate increases may reduce the debt-servicing capacity of non-financial corporates or households. This may lead to a deterioration of asset quality in the loan books of commercial banks, a pick-up in non-performing loans and a lack of confidence in the solvency of the banking sector. If such trends are associated with capital flight and pressure on the exchange rate, the resulting exchange rate depreciation may

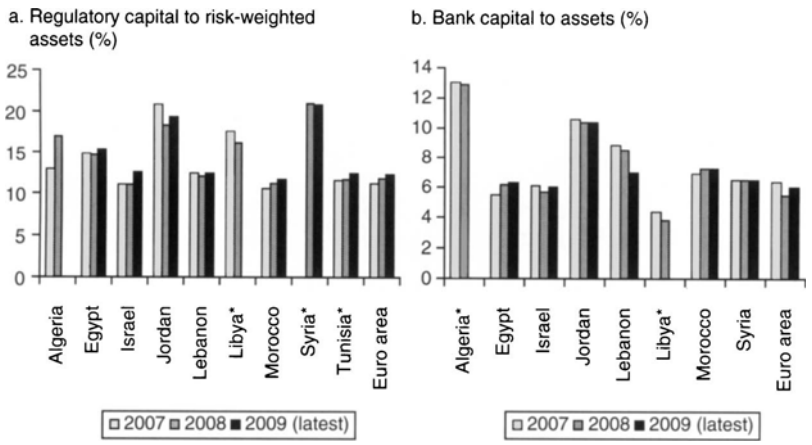

Figure 2.6 Bank capitalisation in Mediterranean countries

Note: * Data from latest IMF Article IV report. Euro area: median figure.
Source: Sturm and Sauter (2010), complemented with recent IMF country reports.

actually translate into increased inflation, and therefore the intended monetary policy tightening may not have the desired effects on prices. In that sense, just as monetary policy may be constrained by public sector solvency considerations ('fiscal dominance'),[19] one could arguably speak of 'financial dominance' when banking sector weaknesses reduce the options for central banks to tighten policy.[20]

A review of some standard financial indicators for a sample of Mediterranean countries suggests that banking sectors are actually in relatively good shape and have warded off the impact of the global financial crisis in 2008 reasonably well. Capital adequacy ratios as measured against risk-weighted assets comfortably exceed regulatory minima (set by most Mediterranean regulators at 10–12%, i.e. above the Basel norm of 8%), and have in most countries remained robust in 2008 and 2009 (Figure 2.6a). Importantly, the level of bank's own capital is also adequate when measured against total unweighted assets, suggesting that leverage ratios remain moderate in the region (Figure 2.6b).

These capital buffers have been built up inter alia through persistent margins of profitability over recent years, mainly reflecting traditional income from net interest margins. Returns on assets and on equity vary considerably across Mediterranean countries but are generally above levels observed in the euro area (Figure 2.7).

The comfortable capital and profitability indicators are, however, not meaningful indicators per se, but should be balanced against the level

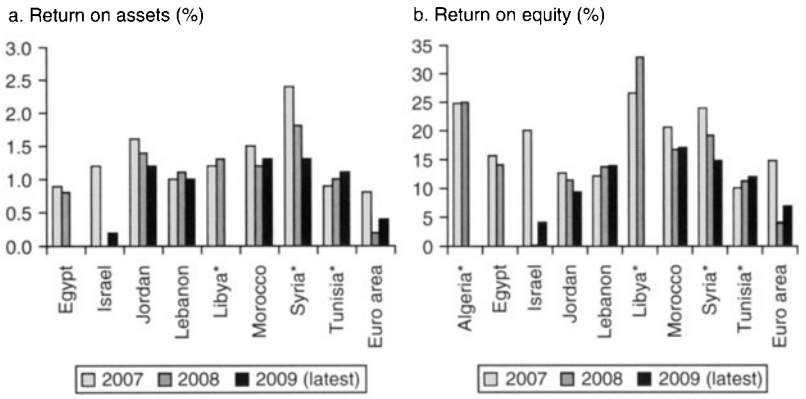

Figure 2.7 Bank profitability

Note: * Data from latest IMF Article IV report. Euro area: median figure.
Source: Sturm and Sauter (2010), based on IMF data.

of prospective risks in the banking sectors. Generally speaking, available analysis, for instance in the IMF's Financial Stability Assessments, suggests that liquidity and market risks are relatively contained, but that credit risks are high in Mediterranean banking sectors. One indicator of such credit risks (or, at least, of past manifestations of credit risks) is provided by the portfolio of non-performing loans. While these are difficult to compare across countries on account inter alia of definitional differences, available evidence suggests that the share of non-performing loans in total loans is high in the Mediterranean countries, in some cases well above 10% (Figure 2.8). Among the three countries that intend to shift towards IT, the non-performing loan ratio as of end-2009 was highest in Egypt (around 15%) and Tunisia (around 13%) and markedly lower in Morocco (around 5%). The high stock of non-performing loans across most Mediterranean countries is mainly the result of past credit booms and is partly related to past practices of directed lending. Across the board, non-performing loan ratios have fallen in most countries, reflecting a combination of growth in the credit portfolio, measures by central banks to address non-performing loans, and favourable economic conditions until at least 2007. Despite this progress, and despite the fact that asset quality appears to have hardly been affected so far by the crisis, credit risks remain the main risk factor in the banking sectors concerned. Further progress to clean up bad portfolios therefore remains a key precondition for a fully fledged move to IT.

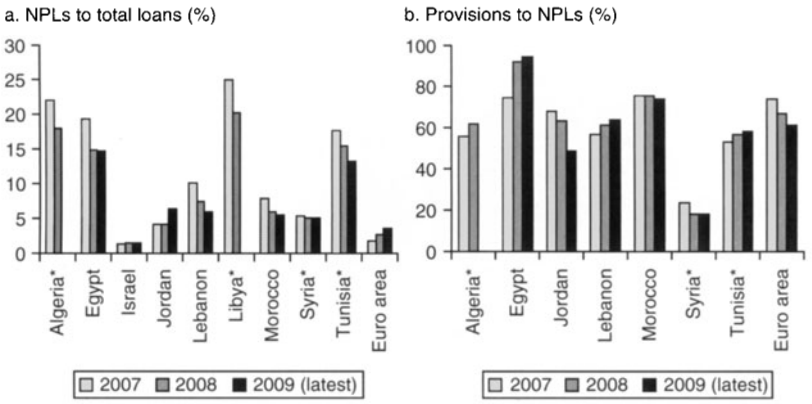

Figure 2.8 Non-performing loans

Note: * Data from latest IMF Article IV report. Euro area: median figure.
Source: Sturm and Sauter (2010), based on IMF data.

2.5 Conclusions

This chapter has argued that a shift from exchange rate-based monetary policy anchors towards more autonomous monetary policy frameworks requires further progress towards financial deepening and financial stability in the MENA countries. From a review of the general economic literature and the specific literature on the region, financial sector developments matter for monetary policy for two main reasons. First, financial markets – and especially the banking sector – should be sufficiently *deep* to allow the central bank to effectively influence the money market and to ensure efficient transmission of monetary policy decisions. Second, financial markets should be sufficiently *stable* to avoid monetary policy decisions being constrained by financial weaknesses.

In terms of financial sector *depth*, this chapter recalls that financial systems in the MENA region tend to be heavily bank-based. Local banking sectors are generally relatively well developed when measured by indicators of size, but private sector access to credit remains limited by a lack of bankable projects, privileged access of the public sector (including public sector companies), an underdeveloped credit culture and limited competition. These elements also restrict the effectiveness of monetary policy transmission. Moreover, banking sectors in the region mostly exhibit a structural liquidity surplus, triggering a need for central banks to design their operational toolkit on the basis of potentially less effective and more costly liquidity-absorption instruments. Capital

markets are generally found to be underdeveloped and to play a subordinate role in financial intermediation.

As regards financial *stability*, financial soundness indicators suggest that Mediterranean banking sectors are relatively well capitalised and profitable, but are still plagued by relatively high levels of non-performing loans. The existence of a large portfolio of these loans may hamper the independent conduct of monetary policy. Although they have generally fallen over recent years, credit risks remain a source of fragility in Mediterranean banking sectors. At the same time, authorities in the region are clearly aware of these risks and, in some cases, are making steady progress in enhancing the efficiency of the banking sector and reducing the level of non-performing loans.

To conclude, financial depth and financial stability are key preconditions for the efficient conduct of monetary policy. Plans to abandon exchange rate anchors and to adopt more autonomous monetary policies should therefore be conditioned upon sufficient financial development in the MENA countries. While financial sectors are generally still relatively underdeveloped, and financial stability is still hampered by a high level of non-performing loans, progress is being made across most countries to enhance the efficiency and resilience of domestic financial markets.

Notes

1. See also Bracke et al. (2011) for a broader discussion of preconditions for inflation targeting in the Mediterranean region.
2. The European Central Bank, for instance, attaches great importance to deep and well integrated money markets for the effectiveness of the single monetary policy in the eurozone, as demonstrated by the ECB's annual publication *Financial Integration in Europe*.
3. They specifically highlight the point that monetary policy transmission is hampered in the case of monetary policy tightening, as a result of asymmetric bank pricing behaviour.
4. See Bordo et al. (2000), Gorton (1988) and Calomiris and Gorton (1991).
5. Masson et al. (1997, p. 10), for instance, argue that financial reforms (alongside fiscal reforms) must be in place 'before inflation targeting can even be attempted'.
6. As another indicator of the pursuit of traditional business models, loan-to-deposit ratios (not shown here) are generally close to 100% in MENA banking sectors.
7. See also Cobham (2011) for an overview of financial structures in MENA countries, including an overview of payment systems.
8. See Sturm and Sauter (2010) for a discussion of possible crowding-out effects in the Mediterranean region.
9. Figures for Lebanon and Egypt are based on data from the respective central banks. In both Lebanon and Egypt, levels of dollarisation as measured

by the share of foreign currency-denominated loans in total loans have remained relatively stable over recent years.

10. Based on a systematic review of central bank balance sheets, Schnabl and Schobert (2009) find that central banks in most MENA countries are liquidity-absorbing 'debtor central banks' due to a general pattern of excessive liquidity creation as well as for country-specific reasons.
11. Net government deposits play a relatively minor role, except in the case of Egypt.
12. Löffler et al. (2010) provide an insightful overview of economic issues related to inflation targeting in an environment of structural liquidity surpluses.
13. Stock market capitalisation figures for 2008 (based on end-year information on share prices) were depressed by the sharp losses in stock markets during that year, following buoyant stock market developments in the preceding year. However, changing the reference year would not qualitatively alter the results.
14. Between 2000 and 2008, the total number of listed companies fell strongly from 1076 to 435 in Egypt, but increased from 53 to 77 in Morocco and from 44 to 49 in Tunisia (based on Standard and Poor's *Global Stock Markets Factbook*, 2009).
15. As of 2008, Egypt ranked 40th in Standard and Poor's global ranking of stock markets by turnover, Morocco 52nd and Tunisia 55th. Major advanced economies and most emerging market economies applying inflation targeting recorded a higher stock market turnover (based on Standard and Poor's *Global Stock Markets Factbook*, 2009).
16. Information on Egyptian government securities markets is based on the IMF staff report for the 2010 Article IV consultation with Egypt.
17. According to the Moroccan Ministry of Finance's 2009 *Rapport de la dette intérieure*, negotiable (domestic) debt as of end-2009 stood at 258 million dirham, 97% of the total (domestic) debt stock of 266 million dirham. More than 43% of securities outstanding as of end-2009 had a residual maturity above 5 years. Securities with an initial maturity of 30 years accounted for around 1% of outstanding debt.
18. See Ministry of Finance of Tunisia, *Brochure de la dette publique mars 2010.*
19. See Sargent and Wallace (1981) and Woodford (1995), among others, on fiscal dominance issues.
20. Fraga et al. (2003) discuss the notion of financial dominance in the context of inflation targeting regimes in emerging market economies.

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3

Fiscal Policy and Macroeconomic Stability in Mediterranean Countries

Michael Sturm and François Gurtner

3.1 Introduction

This chapter reviews fiscal developments and policy issues in Mediterranean countries[1] and their implications for macroeconomic stability and the conduct of monetary policy. Some references are made to oil-centred economies in the Gulf region that face similar issues to those faced by oil-exporters in the Mediterranean region. Fiscal policy is a crucial factor in determining a country's overall economic performance via its effects on allocation, stabilisation and distribution, and constitutes a key component of macroeconomic policies alongside monetary and exchange rate policy. There are at least two reasons why fiscal developments are of great relevance from the perspective of monetary policy. 1) Governments may resort to the central bank for the financing of public deficits rather than borrowing in capital markets and thus fuel inflation. This is more likely the less developed the domestic capital markets, the more severe the impediments and disruptions in accessing international capital markets and the less independent central banks are, and thus appears particularly relevant for developing and emerging market economies. 2) Even in the absence of monetary financing, fiscal policy can have a large impact on the economy via its effects on interest rates, the exchange rate and aggregate demand, as well as on expectations, in particular as regards the sustainability of public debt. Perceptions of the sustainability of fiscal policy can have an impact on financial markets and, if negative, can interfere with the objectives of monetary and exchange rate policy, such as achieving and preserving price stability, financial stability or maintaining an exchange rate peg. In the extreme case, fiscal dominance of monetary policy can lead to a situation in which a central bank is no longer able to use its instruments effectively in order to achieve its objectives.

The analysis in this chapter distinguishes between oil-exporting countries in the Mediterranean region – Algeria, Libya and to a lesser extent Syria – and non-oil-exporting countries – the other seven countries under review – given that hydrocarbon (oil and gas) revenue is an important determinant of fiscal developments and policy issues.[2] Mediterranean economies appear largely heterogeneous also with regard to other economic features; nevertheless some fiscal challenges are common to many of the countries in this region.

The chapter is structured as follows: Section 3.2 reviews developments in key fiscal indicators in Mediterranean countries from a long-term perspective; Section 3.3 highlights important fiscal policy issues and their implications for monetary policy; Section 3.4 concludes.

3.2 Development of key fiscal indicators: a long-term view

In order to assess Mediterranean countries' current fiscal policy issues and challenges, it is useful to look at the longer-term developments in key fiscal indicators, so as to put them into perspective. To this end, this section reviews the development of government balances, debt, expenditure and revenue (all as a percentage of GDP) over the past twenty-five years. It also highlights some key structural features of government budgets.

General government balance-to-GDP ratios

The general government balance-to-GDP ratio of Mediterranean countries has on average improved from a long-term perspective (Figure 3.1). Oil-exporting countries have performed comparatively better than non-oil-exporting countries and the divergence has become more apparent since the turn of the century. Their budget balances have been in surplus (except for Syria) in the wake of the sharp increase in oil prices up to mid-2008. Budget surpluses, however, masked a significant fiscal expansion (see Table 3.5 in Section 3.3). At the same time, oil-exporting countries' budget balances have been more volatile than those of non-oil exporters, reflecting large swings in oil prices in combination with high reliance on oil revenues in the budget. This became apparent again when oil prices fell sharply in the second half of 2008 owing to the intensification of the global financial turmoil and the subsequent recession.

Taken as a group, non-oil-exporting countries have consistently posted budget deficits over the past twenty-five years. In the first half

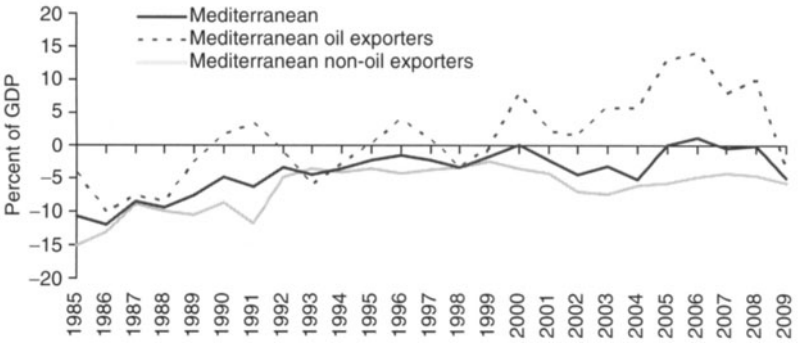

Figure 3.1 General government balance (% of GDP)

Note: Number of countries included in the averages (weighted by GDP in PPP terms) may vary according to data availability. The IMF has implemented methodological changes to the reporting of fiscal data starting with the April 2010 WEO (based on national definition). The data between 2005 and 2009 are based on April 2010 WEO (new methodology). As in this methodology long-time fiscal time series are not available for a large number of Mediterranean countries, the data prior to 2005 are based on October 2009 WEO (old methodology).

Source: IMF and ECB staff calculations.

of the 1990s, the reduction of budget deficits was supported by higher real GDP growth in many countries as compared with the late 1980s.[3] While the average budget deficit of non-oil-exporting countries has fluctuated around 5% of GDP since the early 1990s, several countries have exhibited significantly larger deficits (Table 3.1). In recent years, Lebanon, Egypt and Jordan stand out as the countries with the highest deficits. The global economic downturn of late 2008 and 2009 led to only a moderate weakening of budget balances in non-oil exporting countries of the region (see also Section 3.3).

Public debt-to-GDP ratios

Public debt-to-GDP ratios have declined from the previously very high levels, driven mainly by their steep fall in oil-exporting countries, which since the turn of the century have become much less indebted than non-oil exporters (Figure 3.2). Unlike the situation in advanced economies, the global financial crisis and recession did not lead a to significant increase in public debt.

Non-oil-exporting countries, however, continue to have relatively high debt (Table 3.2), which creates significant vulnerabilities. High debt reflects fiscal profligacy as well as external shocks in past years. The decline of public debt in several countries, in particular in the

Table 3.1 General government balance (% of GDP)

	1985	1990	1995	2000	2005	2006	2007	2008	2009
Non-oil exporting countries									
Egypt	-22.0	-12.6	-1.3	-1.2	-8.4	-9.2	-7.5	-7.8	-7.0
Israel	1.0	-4.6	-4.4	-2.2	-2.5	-1.4	-0.8	-1.6	-5.2
Jordan	-8.3	-6.2	-3.9	-4.7	-5.0	-3.6	-5.8	-5.7	-8.9
Lebanon*	-35.8	-29.8	-13.5	-24.2	-8.4	-10.4	-10.8	-9.7	-8.4
Mauritania	-3.3	-4.4	-5.0	-6.0	–	–	-1.6	-6.5	-5.1
Morocco	-6.9	-0.5	-4.9	-5.3	-4.2	-1.0	1.5	1.2	-2.6
Tunisia	-5.4	-5.4	-4.2	-3.3	-2.6	4.3	-2.0	-0.5	-2.8
Non-oil exporters (average)	*-15.1*	*-8.7*	*-3.6*	*-3.5*	*-5.8*	*-4.9*	*-4.3*	*-4.6*	*-5.7*
Oil-exporting countries									
Algeria*	3.3	3.6	0.4	9.7	13.6	13.9	6.2	9.5	-8.1
Libya*	-12.7	1.3	3.9	13.5	29.4	31.8	25.5	24.6	10.7
Syria**	-13.9	-3.9	-3.8	-1.4	-4.5	-1.1	-4.0	-2.8	-5.5
Oil exporters (average)	*-4.2*	*1.7*	*0.2*	*8.0*	*12.8*	*14.2*	*8.0*	*9.9*	*-3.5*
Mediterranean (average)	**-10.7**	**-4.9**	**-2.3**	**0.1**	**0.1**	**1.1**	**-0.5**	**-0.2**	**-5.1**

Notes: * Central government net lending/borrowing; ** General government revenues minus general government expenditure.
Averages weighted by GDP in PPP terms. The IMF has implemented methodological changes to the reporting of fiscal data starting with the April 2010 WEO (based on national definition). The data between 2005 and 2009 are based on April 2010 WEO (new methodology). As in this methodology, long-time fiscal time series are not available for a large number of Mediterranean countries, the data prior to 2005 are based on October 2009 WEO (old methodology).

Source: IMF and ECB staff calculations.

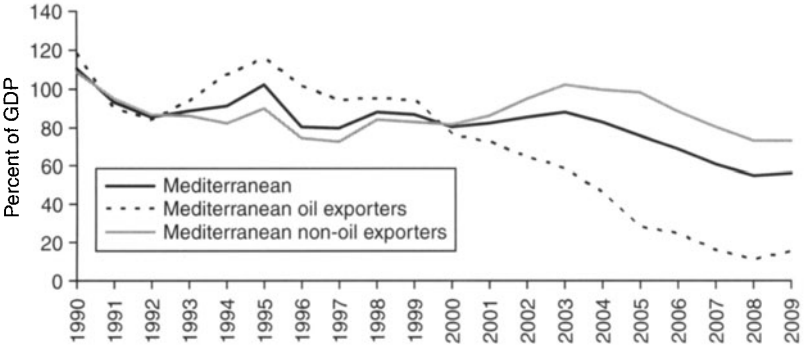

Figure 3.2 General government gross debt (% of GDP)

Note: Number of countries included in the averages (weighted by GDP in PPP terms) may vary according to data availability. The IMF has implemented methodological changes to the reporting of fiscal data starting with the April 2010 WEO (based on national definition). The data between 2005 and 2009 are based on April 2010 WEO (new methodology). As in this methodology long-time fiscal time series are not available for a large number of Mediterranean countries, the data prior to 2005 are based on October 2009 WEO (old methodology).

Source: IMF and ECB staff calculations.

early 1990s, has been the result of both debt rescheduling (inter alia in the framework of the Paris Club) and macroeconomic stabilisation programmes. At present, Lebanon is the most indebted country in the region with a debt-to-GDP ratio of around 150% (2009). Thus, Lebanon is among the countries with the highest public debt worldwide, although public debt has steadily decreased since 2006.

In oil-exporting countries, public debt has continuously declined over recent years. The region's major oil-exporting countries have used part of the windfall profits resulting from high oil prices to repay public debt, which now appears very low (Algeria) or nil (Libya). They are the only countries in the region for which public indebtedness is no longer an issue. Moreover, they have accumulated large foreign assets. The significant debt reduction and asset accumulation between 2003 and mid-2008 are in line with developments in many other major oil-exporting countries over the past decade, for example Saudi Arabia and Russia.

The structure of public debt differs among Mediterranean countries. The vulnerability resulting from high debt, for example in Egypt and Israel, is mitigated by the fact that a large part of debt is domestic, long-term and partially non-tradable, while some countries, notably Lebanon, have a significant external debt or debt with shorter maturities.

Table 3.2 General government gross debt (% of GDP)

	1985	1990	1995	2000	2005	2006	2007	2008	2009
Non-oil exporting countries									
Egypt	–	100.0	–	75.4	112.8	98.8	87.1	76.6	76.2
Israel	188.2	135.3	102.2	84.4	93.5	84.4	78.1	75.4	77.8
Jordan	–	219.7	122.7	103.4	84.0	77.4	74.2	62.3	66.1
Lebanon	–	98.4	78.5	149.8	176.0	179.9	167.8	159.5	152.1
Mauritania	–	185.3	189.1	228.8	208.6	110.5	100.5	90.4	103.0
Morocco	–	79.8	81.1	74.1	63.1	58.1	53.5	47.2	46.9
Tunisia	–	–	58.5	60.7	58.1	53.7	50.0	47.5	47.2
Non-oil exporters (average)	–	*108.6*	*90.2*	*81.7*	*98.7*	*88.9*	*80.8*	*73.5*	*73.7*
Oil-exporting countries									
Algeria*	–	–	116.2	69.4	27.2	23.6	12.5	8.2	15.0
Libya	–	73.6	75.0	43.3	1.0	0.9	0.0	0.0	0.0
Syria	–	182.6	151.6	126.9	56.1	50.6	40.5	30.5	29.1
Oil exporters (average)	–	*118.0*	*115.5*	*77.0*	*28.4*	*25.0*	*16.1*	*11.5*	*15.1*
Mediterranean (average)	–	**110.6**	**102.3**	**80.3**	**76.3**	**68.9**	**60.8**	**54.7**	**56.0**

Notes: * Foreign-currency debt.
Averages weighted by GDP in PPP terms. The IMF has implemented methodological changes to the reporting of fiscal data starting with the April 2010 WEO (based on national definition). The data between 2005 and 2009 are based on April 2010 WEO (new methodology). As in this methodology, long-time fiscal time series are not available for a large number of Mediterranean countries, the data prior to 2005 are based on October 2009 WEO (old methodology).

Source: IMF and ECB staff calculations.

Public expenditure-to-GDP ratios

Public expenditure is relatively high in Mediterranean countries and has remained broadly stable over the past 20 years, at around 35% of GDP (Figure 3.3). Public expenditure in the non-oil-exporting countries of the region was somewhat higher than in oil-exporting countries until 2008. In both groups, there are outliers. In Israel public expenditure has always been well above 40% of GDP, reflecting a developed welfare state akin to those of advanced economies and high defence outlays (see below). In Syria public expenditure in recent years stood at only around 25% of GDP (Table 3.3).

Factors contributing to relatively high expenditure levels compared with other emerging market economies include defence outlays (in particular in Eastern Mediterranean countries) reflecting political tensions in the region.[4] Interest expenditure is also a significant burden for several non-oil-exporting countries. In highly indebted Lebanon it still accounts for 11% of GDP and around one-third of total expenditure despite the relief brought about by several rounds of international donor assistance, and in Israel and Egypt it stands at around 5% of GDP (2008). Moreover, energy and food subsidies and expenditure on wages and salaries tend to be high.[5] The large government sectors in Mediterranean (and other Middle Eastern) countries have repeatedly been identified as

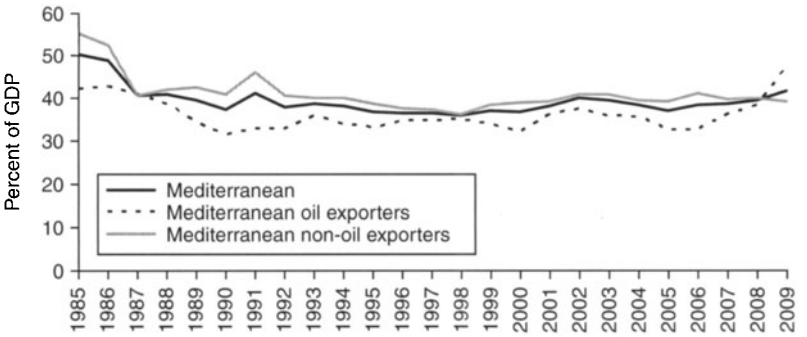

Figure 3.3 General government expenditure (% of GDP)

Note: Number of countries included in the averages (weighted by GDP in PPP terms) may vary according to data availability. The IMF has implemented methodological changes to the reporting of fiscal data starting with the April 2010 WEO (based on national definition). The data between 2005 and 2009 are based on April 2010 WEO (new methodology). As in this methodology long-time fiscal time series are not available for a large number of Mediterranean countries, the data prior to 2005 are based on October 2009 WEO (old methodology).

Source: IMF and ECB staff calculations.

Table 3.3 General government expenditure (% of GDP)

	1985	1990	1995	2000	2005	2006	2007	2008	2009
Non-oil exporting countries									
Egypt	56.8	32.9	28.6	29.9	33.2	37.8	35.3	35.6	34.8
Israel	64.5	54.8	52.3	47.8	46.2	45.6	44.8	43.8	42.4
Jordan	44.0	42.9	38.3	34.7	38.7	36.9	37.2	35.6	36.2
Lebanon	53.9	39.4	30.7	43.3	30.9	35.5	35.3	34.0	33.7
Mauritania	34.5	26.8	24.2	30.7	33.7	28.5	29.6	30.6	30.6
Morocco	27.1	24.6	26.4	28.9	28.4	26.6	26.3	29.9	29.1
Tunisia	38.8	36.8	34.4	32.7	32.5	32.2	32.2	33.6	33.4
Non-oil exporters (average)	*51.4*	*36.9*	*34.7*	*35.1*	*35.4*	*37.2*	*35.8*	*36.2*	*35.3*
Oil-exporting countries									
Algeria	34.0	25.3	29.5	28.6	27.1	28.8	33.5	37.7	45.0
Libya	44.9	33.2	28.6	28.2	33.5	31.0	35.3	39.3	55.4
Syria	41.2	28.3	29.8	27.4	28.5	26.6	26.6	22.1	27.3
Oil exporters (average)	*38.4*	*27.8*	*29.4*	*28.2*	*28.7*	*28.8*	*32.3*	*34.5*	*43.2*
Mediterranean (average)	**46.2**	**33.6**	**32.9**	**32.9**	**33.3**	**34.5**	**34.7**	**35.7**	**37.7**

Note: Averages weighted by GDP in PPP terms. The IMF has implemented methodological changes to the reporting of fiscal data starting with the April 2010 WEO (based on national definition). The data between 2005 and 2009 are based on April 2010 WEO (new methodology). As in this methodology, long-time fiscal time series are not available for a large number of Mediterranean countries, the data prior to 2005 are based on October 2009 WEO (old methodology).

Source: IMF and ECB staff calculations.

one of the factors explaining the disappointing growth performance of the region as compared with other emerging market economies.[6]

In the major oil-exporting countries, Algeria and Libya, although public expenditure increased significantly in recent years in the context of rising oil prices and revenues, it remained relatively stable as a share of GDP, since nominal GDP also increased as a result of rising oil prices. With the sharp fall in oil prices in the second half of 2008 and the associated decline in nominal GDP, public expenditure as a share of GDP increased significantly in 2009 in both countries, as high levels of public spending were maintained or even increased. Public expenditure was largely driven by spending on physical and social infrastructure, but current outlays also increased.

Public revenue-to-GDP ratios

Public revenue as a percentage of GDP has been broadly stable at around 35% over recent decades (Figure 3.4). Since the turn of the century, it has increased to above 40% in oil-exporting countries, reflecting higher hydrocarbon revenues. For these countries, hydrocarbon revenues are by far the most important source of income (see Table 3.6). However, there are significant differences between countries, with Libya's revenue-to-GDP ratio standing above 60% in recent years while Syria's has fallen to less than 20% owing to declining oil reserves (Table 3.4).

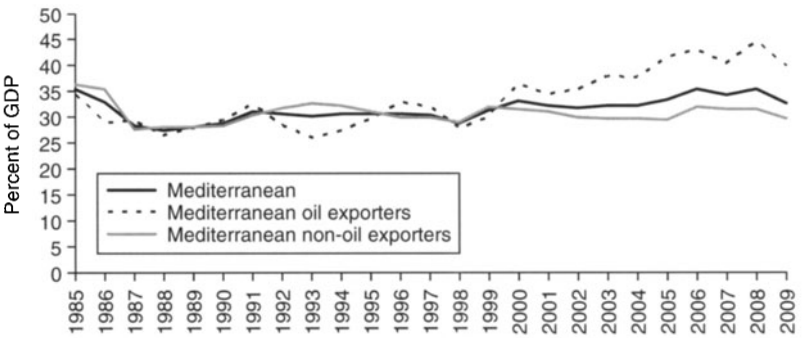

Figure 3.4 General government revenue (% of GDP)

Note: Number of countries included in the averages (weighted by GDP in PPP terms) may vary according to data availability. The IMF has implemented methodological changes to the reporting of fiscal data starting with the April 2010 WEO (based on national definition). The data between 2005 and 2009 are based on April 2010 WEO (new methodology). As in this methodology long-time fiscal time series are not available for a large number of Mediterranean countries, the data prior to 2005 are based on October 2009 WEO (old methodology).

Source: IMF and ECB staff calculations.

Table 3.4 General government revenue (% of GDP)

	1985	1990	1995	2000	2005	2006	2007	2008	2009
Non-oil-exporting countries									
Egypt	34.8	20.3	27.3	28.7	24.8	28.6	27.7	27.8	27.8
Israel	65.5	50.3	47.8	45.6	44.1	44.4	44.6	41.9	36.9
Jordan	35.7	36.7	34.4	30.0	33.2	32.8	32.5	31.2	27.6
Lebanon	18.1	9.7	17.2	19.1	22.5	25.1	24.4	24.3	25.3
Mauritania	31.2	22.5	19.2	24.7	26.6	64.3	28.0	24.1	25.5
Morocco	20.2	24.1	21.5	23.6	24.2	25.6	27.8	31.1	26.5
Tunisia	33.4	31.4	30.2	29.4	29.4	29.4	30.0	32.6	31.5
Non-oil exporters (average)	*36.3*	*28.2*	*31.1*	*31.6*	*29.5*	*31.9*	*31.6*	*31.6*	*29.6*
Oil-exporting countries									
Algeria	37.2	28.9	30.0	38.3	40.9	40.8	42.7	39.6	47.2
Libya	32.2	34.5	32.5	41.8	62.9	62.9	62.8	60.8	64.0
Syria	27.3	24.3	25.9	26.0	24.0	24.0	25.5	22.7	19.4
Oil exporters (average)	*34.2*	*29.5*	*29.6*	*36.2*	*41.5*	*43.0*	*40.3*	*44.4*	*39.7*
Mediterranean (average)	**35.5**	**28.7**	**30.6**	**33.0**	**33.3**	**35.4**	**34.3**	**35.5**	**32.7**

Note: Averages weighted by GDP in PPP terms. The IMF has implemented methodological changes to the reporting of fiscal data starting with the April 2010 WEO (based on national definition). The data between 2005 and 2009 are based on April 2010 WEO (new methodology). As in this methodology, long-time fiscal time series are not available for a large number of Mediterranean countries, the data prior to 2005 are based on October 2009 WEO (old methodology).

Source: IMF and ECB staff calculations.

In non-oil-exporting countries, public revenue as a percentage of GDP has remained stable, at around 30%, over the past 20 years. The level of total revenue broadly mirrors public expenditure. Thus, Israel is an outlier with a higher revenue-to-GDP ratio, as the country differs from other countries in the region in having a well developed tax system. In Lebanon, revenue stood at around 25% of GDP in the period 2006–9, marking a sharp increase compared with the earlier period, but the country still has the lowest revenue-to-GDP ratio among non-oil exporters in the region.

In fact, many of these countries are distinguished by a low weight of tax revenue, as witnessed by a relatively low ratio of tax to GDP, and in particular a low share of direct taxes.[7] While in oil-exporting countries this reflects the high share of oil revenues in the budget, which impedes the development of alternative sources of revenue, in non-oil-exporting countries it points to the role of the informal economy and the need to strengthen tax administration. The degree of donor dependence is high in several Eastern Mediterranean countries; in some cases, donor support has amounted to around 10% of GDP over recent years.

3.3 Key fiscal policy challenges in Mediterranean countries and their implications for monetary policy

This section reviews key fiscal challenges in Mediterranean countries, which are relevant for monetary policy. A distinction is made between non-oil exporters and oil exporters. Furthermore, the section discusses specific features on the revenue and expenditure side and their implications for monetary policy, and fiscal rules and the contribution they can make to improve fiscal policy outcomes and thereby the environment in which monetary policy is conducted.

The main channels through which fiscal policy can affect monetary policy and price stability (as well as macroeconomic and financial stability more broadly) are interest rates and sovereign spreads, the exchange rate, aggregate demand, and expectations.[8] In general, overly expansionary fiscal policies and high public debt complicate the conduct of monetary policy. For example, high deficits may exacerbate inflationary pressure by increasing domestic demand. If debt and deficit levels fuel doubts about the sustainability of public finances, they will increase sovereign spreads and put downward pressure on the exchange rate. They may thereby impede the monetary policy transmission mechanism, and may even lead to fiscal dominance of monetary policy. In this case a restrictive monetary policy to counter inflationary pressure may

have unconventional effects, as rising interest rates increase the default risk, and lead to capital outflows and thus to a depreciating currency, which in turn causes inflation to increase.[9] Thus, sound fiscal policies are conducive to a macroeconomic environment in which the task of a stability-oriented central bank will be substantially facilitated.

Most Mediterranean countries have achieved a relatively high degree of macroeconomic stability in recent years compared with earlier decades, best evidenced by generally lower inflation (Figure 3.5). While lower inflation has been part of a global trend observable in many emerging market economies over the 1990s, it also reflects deliberate policy efforts in the region, for example the strengthening of monetary frameworks and structural reforms, in several cases underpinned by IMF programmes.[10] The spike in inflation in 2007–8 was mainly caused by the rise in global commodity – and in particular food – prices. Its impact on inflation rates in Mediterranean countries was significant given the high weight of food items in CPI baskets.[11] Inflation rates declined across the region in the wake of the global economic downturn in the second half of 2008 and 2009; however, they remained relatively high in a few countries, which points to the need for further stabilisation efforts.

Over the longer term, fiscal consolidation has been an important element of macroeconomic stabilisation, as high fiscal deficits were at the root of instability in many Mediterranean countries during the 1980s. Examples are Israel before the stabilisation programme of 1985, Egypt before 1992 and Jordan before the currency crisis of 1989.

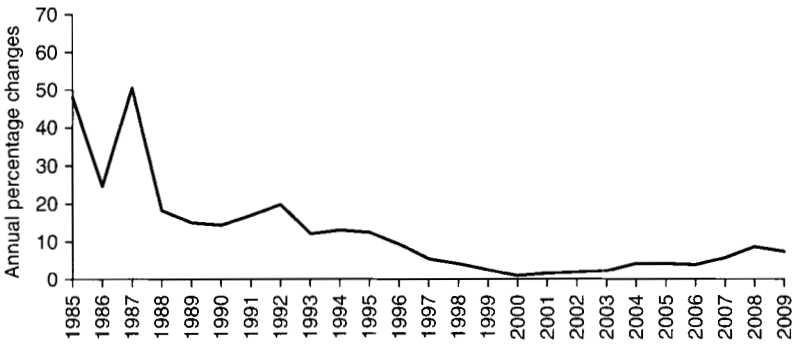

Figure 3.5 Inflation (annual percentage changes)

Note: Average annual inflation rate of Mediterranean countries weighted by GDP in PPP terms.

Source: IMF and ECB staff calculations.

Non-oil-exporting countries: challenges resulting from high deficits and debt

Notwithstanding progress in bringing down inflation and reducing budget deficits and public debt, many non-oil-exporting countries in the region still exhibit relatively high deficits and remain highly indebted (Section 3.2). In some cases, the debt structure also appears fragile. Most studies indicate that the sustainable level of public debt for emerging market economies – while varying among countries – is relatively low in comparison with advanced economies and generally below 50% of GDP.[12] With the exceptions of Morocco and Tunisia, which recently managed to reduce their public debt-to-GDP ratio to below 50%, public debt of all non-oil-exporting Mediterranean countries was significantly above this threshold in 2009 (see also Table 3.2 in Section 3.2) and above the levels in many other emerging market economies. In addition to recorded public debt, some countries appear to face contingent liabilities, for instance in the form of non-performing loans in the banking sector.[13] Furthermore, implicit liabilities of pay-as-you-go pension systems could pose additional challenges for some countries in the region.[14] As a result, these countries face continued vulnerabilities and a limited capacity to absorb shocks without jeopardising macroeconomic stability and debt sustainability. Little scope exists for policy slippage or for accommodating external shocks resulting in expenditure increases or revenue losses. Accordingly, a continuous debt reduction is warranted, requiring constant fiscal discipline and sustained economic growth. This has become even more important in the aftermath of the global financial crisis and financial markets' increased sensitivity to sovereign risk.

Vulnerability is highest in those countries which combine a high debt level, a high share of external debt (or foreign currency-denominated debt), an open capital account and an exchange rate peg, and in addition exhibit large current account deficits. This is the case for Lebanon, and to a lesser extent for Jordan. Debt sustainability is the key issue for Lebanon, given the level and the structure of public debt. The strong linkage between the public sector and the financial system via the banks' holding of government securities, together with a high share of foreign currency-denominated debt (almost 50% of total public debt, equivalent to around 75% of GDP), represent a significant vulnerability and require the continued inflow of deposits from abroad into the domestic banking system. This is crucial to enable the banking sector to continue to finance large government deficits. Accordingly, maintaining confidence

in macroeconomic stability and public finances is of key importance to the country. Over the medium term, structural fiscal reforms appear inevitable to maintain fiscal sustainability.[15]

Given the fiscal position of non-oil-exporting Mediterranean countries, the abrupt global economic downturn in 2008–9 following the global financial turmoil that started in 2007 and intensified in autumn 2008 posed a major challenge. Budget balances weakened in the wake of the global recession; however, fiscal deficits did not increase as significantly as in advanced economies. This was the result of a number of factors: 1) the economic slowdown was less pronounced than in advanced and in some other emerging market economies, especially in Central and Eastern Europe; 2) automatic stabilisers are relatively weak (see below); 3) expenditure on oil and food subsidies declined in several countries after the fall in global commodity prices, that is, some offsetting factors were at work. Some non-oil-exporting countries launched fiscal stimulus programmes.[16] However, unlike the situation in oil-exporting countries (see below), fiscal space for countercyclical policies was very limited or even absent in view of the high public debt of many countries (Figure 3.6).[17] Any discretionary fiscal measures to sustain domestic demand had to be carefully balanced with the need to maintain confidence and long-term fiscal sustainability.

This episode points to the implications of the fiscal setting in non-oil-exporting Mediterranean countries for monetary policy. The limited fiscal space to conduct countercyclical policies left monetary policy as the only macroeconomic stabilisation tool. The monetary policy response to the economic slowdown depended on country-specific circumstances such as the intensity of the slowdown, inflationary pressure, the monetary transmission mechanism, considerations concerning capital inflows and current account positions, and the exchange rate regime.

In countries with fixed pegs and tightly managed floats – the prevailing exchange rate regimes in the Mediterranean region – the monetary policy response was constrained by the exchange rate arrangements. Israel – the only country with a fully fledged inflation targeting (IT) framework – had more room for manoeuvre and indeed exhibited the most active monetary policy response in the wake of the crisis. A relatively low budget deficit at the outset of the global recession also allowed for countercyclical fiscal policies – through automatic stabilisers and discretionary measures – that helped to cushion the impact of the crisis, to which Israel was more exposed than other countries of the region.[18]

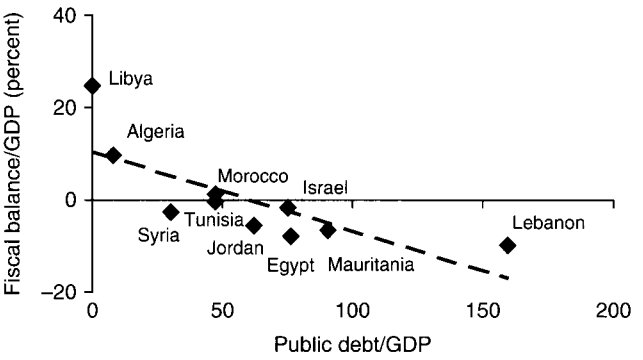

Figure 3.6 Fiscal capacity in Mediterranean countries, 2008 (%)

Note: General government balance and gross government debt to GDP in 2008.

Source: IMF and ECB staff calculations.

Apart from constraining the stabilisation function of fiscal policy, the fiscal vulnerabilities in non-oil-exporting Mediterranean countries confront monetary policy with the risk that adverse macroeconomic and fiscal developments interfere with monetary policy objectives and undermine macroeconomic and financial stability. They have the potential to raise doubts about debt sustainability. This could lead to an increase in interest rates/sovereign spreads and inflation expectations, to downward pressure on the exchange rate, and ultimately to enhanced inflationary pressures. In the extreme, this may result in fiscal dominance of monetary policy – as experienced, for example, in Turkey after the crisis of 2000–1 (see Box 3.1). Even in the absence of such a scenario, central banks face the risk of being pressured into accommodating fiscal policies, thereby reducing emphasis on keeping inflation in check. Empirical evidence indicates that the response of interest rates to inflation in emerging market economies weakens with higher debt-to-GDP and external debt-to-GDP ratios. Thus, higher public indebtedness may end up constraining the response of central banks to changes in inflationary pressure.[19]

The direct role of central banks in the region in financing budget deficits has diminished over recent decades, as a result of the strengthening of monetary policy frameworks. In some countries, central bank credit to the government is legally forbidden (e.g. in Israel, where in 1985 the so-called 'no printing law' was enacted, and in Morocco), while most central bank laws limit credit to the government to overdrafts. Lending to the government is a significant item in some Mediterranean

Box 3.1 Fiscal dominance of monetary policy: lessons from Turkey[a]

The case of Turkey before and in the aftermath of the 2000–1 financial crisis embodies at least five lessons with regard to the interaction of fiscal and monetary policy in emerging market economies:

1. Undisciplined fiscal policy and the monetisation of public deficits were key factors in Turkey's chronically high inflation rate prior to the successful macroeconomic stabilisation after the 2000–1 crisis.
2. Given this track record, fiscal variables such as the primary surplus and the debt burden and expectations regarding fiscal policy were crucial in the formation of inflation expectations in Turkey.
3. Against this background, enhanced fiscal discipline was the major anchor of the disinflation process in Turkey, alongside a strengthened monetary policy framework, which gave credibility to the Central Bank of the Republic of Turkey (CBT).
4. Despite significant fiscal tightening and enhanced central bank credibility, monetary policy was constrained by concerns about debt sustainability, and the CBT could not use its instruments in the same way as a central bank not operating in the shadow of public (over-) indebtedness. This was one of the key reasons why the CBT operated under an 'implicit' inflation targeting regime in the initial years after the crisis and refrained from moving to a fully fledged inflation targeting framework until fiscal dominance had receded.
5. Turkey's record in the years after the 2000–1 crisis is an example of non-Keynesian effects of fiscal policy. Rapid disinflation and tight fiscal policies were accompanied by buoyant economic growth. Fiscal discipline was a precondition for growth, given that any relaxation of fiscal policy would have translated into higher (nominal and real) interest rates in view of the concerns about debt sustainability and the significance of fiscal variables for inflation expectations.

Note [a] See also Chapter 8 of this book by Ersel and Özatay, as well as Emir et al., (2004), Celasun et al. (2004), Özatay (2005) and Kara (2006).

countries' central bank balance sheets; however, this may be a legacy of the past – as, for example, in Egypt – and does not necessarily point to the provision of credit to the government in recent times. Nevertheless, in the absence of clear legal provisions ruling out central bank lending to the government and safeguarding central bank independence, the existence of fiscal vulnerabilities implies that, in a situation of fiscal stress, governments may put pressure on the central bank to finance public deficits, to the detriment of monetary policy objectives. This is more likely when access to international financial markets is difficult,

when domestic financial markets are less developed and when fiscal rigidities complicate budgetary adjustments (see below). In countries that are aiming to move towards fully fledged IT regimes, a clear legal prohibition of monetary financing would underpin the credibility of the monetary policy framework, as part of an overall institutional setting ensuring central bank independence.[20]

Ultimately, however, sound fiscal positions and monetary policy frameworks are conducive to the smooth conduct of monetary policy and the maintenance of macroeconomic stability irrespective of the exchange rate regime. In countries where exchange rate pegs have been the linchpin of macroeconomic stability in recent years, such as Jordan and Lebanon, they are key to preserving the credibility of the external anchor. As the credibility of domestic nominal anchors of monetary policy may also be jeopardised by high and rising public deficits and debt, the same applies to countries with floating exchange rates. Thus, sound fiscal positions are also particularly important for countries that aim to adopt an IT framework, such as Egypt, Morocco and Tunisia, where a new monetary regime would need to gain credibility.

Oil-exporting countries: challenges resulting from dependence on hydrocarbon revenues and implications of exchange rate regimes

Fiscal challenges and their potential impact on monetary policy in oil-exporting Mediterranean countries are of a different nature from those in non-oil-exporting countries (see Box 3.2 on the specific challenges for fiscal policy in oil-centred economies). Algeria and Libya used the period of high oil prices between 2003 and mid-2008 to significantly reduce or, in the case of Libya, eliminate public debt. Moreover, the windfall oil revenues of those years enabled them to accumulate large foreign assets, despite a considerable fiscal expansion (Table 3.5), which was masked by large budget surpluses. Both countries launched ambitious programmes to upgrade their physical and social infrastructure and thus significantly increased public capital but also current expenditure.[21] Accordingly, these two countries have more room for manoeuvre and are in a much better position to cope with potential shocks. Because of their high dependency on hydrocarbon revenues, their main source of vulnerability is a sharp fall in hydrocarbon prices.

The typical fiscal shock for oil-exporting countries materialised in the second half of 2008, when oil prices dropped sharply and rapidly in the wake of the intensification of global financial turmoil and economic downturn. As a result, budget balances in 2009 deteriorated sharply in Algeria

Table 3.5 Fiscal expansion in oil-exporting countries, 2003–2008

	Algeria*	Libya	Syria	Saudi Arabia	Kuwait	Qatar	UAE
General government expenditure increases							
2003	-3.5	33.1	10.1	5.1	9.1	10.6	5.8
2004	16.7	28.6	13.2	17.4	13.7	43.2	5.4
2005	21.9	15.7	6.9	11.9	10.3	40.6	8.1
2006	13.9	12.6	7.3	12.6	41.0	32.3	22.3
2007	31.3	37.6	14.3	16.1	3.9	26.2	30.7
2008	19.7	45.2	18.9	11.0	43.9	12.8	45.0
Non-oil deficit to non-oil GDP							
2003	-27.9	-79.1	-22.0	-46.7	-44.5	-40.6	-29.3
2004	-30.1	-111.9	–	-45.8	-45.3	-33.0	-22.9
2005	-34.7	-130.4	–	-50.9	-15.9	-50.3	-17.0
2006	-35.6	-135.3	–	-52.7	-30.3	-41.3	-13.7
2007	-45.7	-136.0	–	-59.0	-30.4	-33.5	-14.2
2008	-53.3	-165.8	–	-60.6	-52.6	-26.4	-27.1

Note: * Central government only.

Source: IMF (WEO and REO).

and Libya, by around 15% of GDP, moving from high budget surpluses in 2008 to a large deficit (Algeria) or a much lower but still significant surplus (Libya). This was the result of the sharp fall in oil prices in combination with the high dependency of budgets on oil revenues (see Table 3.6).

However, the major oil exporters in the region have significant fiscal space. After the sharp fall in oil prices since mid-2008, they have used this fiscal space to support domestic non-oil GDP growth and thus like other major oil exporters in the Gulf region have also contributed to global stabilisation efforts by sustaining import demand. Thereby, in the wake of the economic downturn they avoided the pro-cyclical pattern that has characterised fiscal policy in many oil-exporting countries in the past. For example, the fall in oil revenues from previous heights notwithstanding, Algeria went ahead with its multi-year public investment programme, which in 2010 was further augmented to USD 286 billion (over 2010–14) and succeeded a USD 200 billion programme for 2005–9. Oil-exporting countries with large foreign

Box 3.2 Fiscal policy challenges in oil-exporting countries

Fiscal policy in oil-exporting countries faces specific challenges related to the fact that oil revenues are exhaustible, volatile and unpredictable, and largely originate abroad. These features of oil revenues pose challenges in both the long and the short term.[a] Their relevance depends on the share of hydrocarbon (oil and gas) revenues in the government's overall revenues and in total exports and the weight of the hydrocarbon sector in the economy. In the Mediterranean region, these shares are high in Algeria, Libya and – to a lesser extent – Syria.

Table 3.6 Hydrocarbon dependency of Mediterranean countries, 2007

Hydrocarbon share (%)	Algeria	Libya	Syria
Government revenue	76	90	22
Total exports	98	97	38
GDP	44	72	14

Source: IMF.

Long-term challenge

In the long term, the challenge derives from the exhaustibility of oil reserves and concerns the issues of budgetary sustainability and intergenerational resource allocation. To avoid a sharp adjustment of fiscal policy once oil reserves are exhausted and to secure the participation of future generations in this source of national wealth, oil-exporting countries have to accumulate financial assets during the period in which they produce oil, in particular when prices are high. After the end of oil production, the revenues from these assets can be used to replace oil income and to maintain levels of expenditure. Oil wealth is thus gradually transformed into financial wealth, leaving the country's overall wealth unchanged and preserving it for future generations. Intuitively, this reasoning is straightforward and makes a strong case for persistent overall fiscal surpluses to accumulate assets. However, deriving concrete policy conclusions and making them operational is challenging. For example, estimating the oil wealth of a country, defined as the discounted present value of future oil revenues, is surrounded by significant uncertainty regarding the underlying assumptions, for example, about the future path of oil prices, about oil reserves, and about the costs of extracting them, which supports a generally cautious approach to fiscal policy. Uncertainty also prevails regarding the role of government capital expenditure in preserving overall wealth. In principle, capital expenditure and the accumulation of real assets could represent an alternative to the accumulation of financial assets, thereby reducing the

need for persistent fiscal surpluses. However, the uncertainties surrounding the effects of public capital expenditure on productivity, future output and government revenues, and the difficulties in distinguishing between capital expenditure and current expenditure, warrant caution in this regard. Indeed, due to the governance and institutional deficiencies that can be observed in some oil-exporting countries, the ex-post real return of public investment may be lower than the return on financial assets offered by mature economies.

Short-term challenge

The main short-term challenge for fiscal policy in oil-exporting countries stems from the unpredictability of oil prices. Public finances are highly dependent on a volatile variable that is largely beyond the authorities' control. This poses a problem with regard to both macroeconomic management and fiscal planning. The volatility of oil prices, and hence of government revenues, tends to contribute to a pro-cyclical pattern and abrupt changes in government spending, as experienced in many countries during the 1970s and 1980s, which may translate into macroeconomic volatility and reduced growth prospects. Thus, there is a case for smoothing public expenditure in oil-exporting countries, which is further reinforced by the other potential fiscal costs of volatile expenditure policies. These may include a reduction in the quality and efficiency of spending due to constraints in administrative capacity or the realisation of projects with little marginal value added during periods of high oil prices, and difficulties in containing and streamlining expenditure following an expansion. The planning of the fiscal stance by targeting a particular level of the overall budget balance is rendered difficult by oil price volatility. Therefore, other indicators are needed to guide fiscal policy and to assess the underlying fiscal stance, such as the non-oil balance/non-oil GDP ratio, an indicator which isolates the budget balance from oil price developments.

Stabilisation and savings funds[b]

Several countries that derive substantial export and fiscal revenue from oil (or other non-renewable resources) have set up stabilisation and savings funds to deal with both the long-term and the short-term challenges to fiscal policy. The savings function of such funds is meant to address the long-term issue of intergenerational equity and fiscal sustainability by accumulating assets, while the stabilisation function addresses the short-term issues of fiscal planning and macroeconomic stability by absorbing and injecting revenue from/into the budget. However, such funds pose a number of problems in themselves, for example as regards governance, transparency and accountability. They are not a substitute for explicit fiscal policy decisions or (numerical or procedural) fiscal rules and political commitment both to smoothing expenditure and to ensuring long-term fiscal sustainability. Furthermore, their contribution to sound fiscal policies depends on the general quality of institutions and public financial management.

Oil-exporting countries could in principle also deal with the unpredictability of oil prices and revenues by using market instruments to hedge oil market risks. Mexico has resorted to this instrument in recent years; however, in general, financial derivatives seem to be sparsely used by major oil-exporting countries. This may be due, among other things, to the fact that so far the markets for such products are underdeveloped and to political economy and institutional constraints.[c]

In the Mediterranean region, both Algeria and Libya have established oil funds. In 2000, Algeria established an off-budget hydrocarbon stabilisation fund (*Fonds de régulation des recettes*) in order to: 1) reconstitute the cushion of external reserves that had previously declined; 2) service the stock of public debt; 3) smooth the longer-term profile of expenditures. The fund does not have an intergenerational transfer purpose. Hydrocarbon revenues in excess of those budgeted (usually on very conservative oil price assumptions) are deposited in the fund. The operational features of the fund leave significant room for discretion. Libya has had an oil reserve fund (ORF) since 1995, which is a government account managed by the central bank. It accumulates oil revenue in excess of the level determined by a budgetary oil price. Withdrawals from the ORF, mostly for current expenditure, take place on a discretionary basis. The ORF is not integrated into the budget, and its operations are not considered transparent.

Notes

[a] See Barnett and Ossowski (2002).

[b] See Davis et al., (2001). Stabilisation and savings funds are also referred to as sovereign wealth funds.

[c] For a discussion of hedging against oil price volatility, see IMF (2007) and Daniel (2001).

assets and low public debt are well positioned to bridge a period of temporarily low oil prices. If oil prices were to remain at relatively low levels for a protracted period, however, oil exporters would have to adjust fiscal policy or risk accumulating large public debt again, as in the 1980s and 1990s.

Syria, by contrast, faces a significant immediate structural fiscal challenge given dwindling oil reserves, which serves as a reminder of the exhaustibility of oil revenues and the need to address this issue in time. Oil-related revenues fell from above 50% of total revenues at the turn of the century to around 20% in 2009, and the country became a net oil importer as early as 2007. Thus, in addition to increasing exploration, the pressing current necessity is to develop alternative sources of government revenue. As Syria has not accumulated financial assets, there is an urgent need for a major fiscal adjustment, both on the expenditure side – in particular by cutting fuel subsidies, which accounted for

more than 10% of GDP in recent years (it is planned to replace fuel subsidies with targeted cash transfers) – and on the revenue side, by developing alternative sources of revenue (e.g. by introducing a type of value added tax, which was due in 2009 but postponed given the inflationary impact of this measure).

With reference to the experience of major oil-exporting countries in the Middle East beyond Algeria and Libya, in particular the countries of the Gulf Cooperation Council (GCC), the years of high and rising oil prices between 2003 and mid-2008 provide interesting evidence of the interplay between monetary policy and exchange rate frameworks and fiscal policy in these countries.[22] Most major oil exporters in the Middle East have an external anchor of monetary policy, with a strong orientation to the US dollar.[23] In the wake of oil price increases, oil-exporting countries enjoyed high real GDP growth between 2003 and 2008, which was notably fuelled by expansionary fiscal policy (see above). This contributed to a significant increase in inflation rates, which were driven by a mixture of global and domestic factors.[24] The nominal effective exchange rates (NEERs) of major oil exporters depreciated from 2002, that is, depreciation set in at around the time when the oil-driven economic boom started (Figure 3.7). The nominal effective depreciation reflected the weakness of the US dollar over these years against other major currencies and was one source of inflationary pressure. Monetary policy was constrained in tackling inflation due to the prevailing exchange rate regimes. Central banks had little room for manoeuvre to use interest rates to curb inflation. In spite of increasing

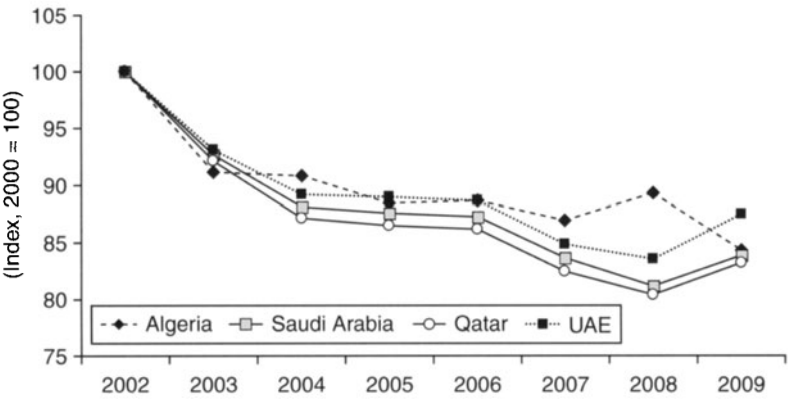

Figure 3.7 Nominal effective exchange rates (2002 = 100)

Sources: Haver Analytics, IMF and ECB staff calculations.

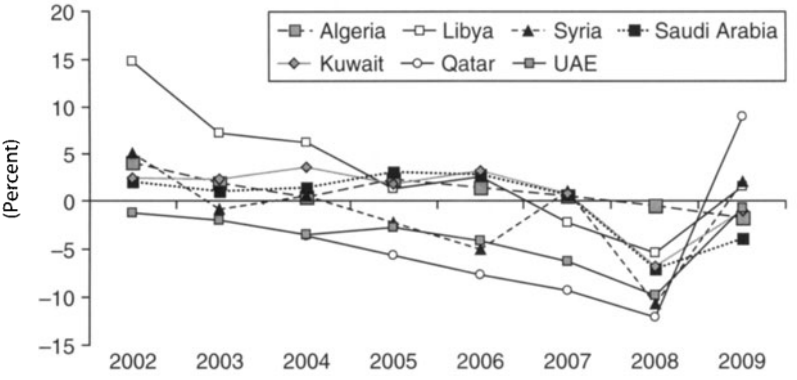

Figure 3.8 Real interest rates (%)

Sources: Haver Analytics, IMF, national sources and ECB staff calculations.

upward pressure on prices and buoyant economic growth, real interest rates were declining or even turned negative (Figure 3.8), thereby contributing to rapid money and credit growth and rising asset prices.[25] Monetary conditions can thus be considered to have been relatively loose in those years in most oil-exporting countries. This was the result of the prevailing exchange rate regimes in combination with monetary policy in the anchor country, the United States, and the depreciation of the US dollar against other major currencies.

Given the existing monetary policy and exchange rate frameworks, fiscal policy is the main macroeconomic tool available to tackle inflation. This would have called for more restrictive fiscal policies in the years of high oil prices. However, fiscal policy has been expansionary due to various spending pressures stemming from primarily distribution-related considerations (pressures to immediately redistribute windfall oil revenues to the population), development-related spending needs in, for example, the areas of physical and social infrastructure (in view of the development level of most oil exporters) and international considerations (oil revenue recycling, in particular in the context of global imbalances). Calibrating fiscal policy between these considerations, which call for fiscal expansion, and cyclical and intergenerational equity considerations, which call for fiscal restraint, was a major challenge for oil-exporting countries between 2003 and 2008.

The risk of repeating such an episode of surging inflation exists if oil price rises again generate large windfall revenues and cyclical conditions between oil exporters and the anchor country diverge. To mitigate

this risk, monetary policy could be given a more active role in containing inflationary pressure, that is, more scope to tighten monetary conditions via higher interest rates. This would require more exchange rate flexibility. If this is deemed not desirable or feasible, avoiding procyclical fiscal policies is crucial when oil prices are high and rising. This would require strong fiscal institutions, for example fiscal rules (see below) that ensure fiscal discipline and counteract the various spending pressures in boom periods.

Implications of specific revenue and expenditure features for monetary policy

The structure of government budgets in Mediterranean countries, both on the revenue and on the expenditure side, exhibits specific features that have potential implications for monetary policy.[26]

The large role of subsidies in many countries' budgets (and regulated prices) is one such feature. From a fiscal, a distributional and an allocation perspective, a reduction and eventual elimination of subsidies and a liberalisation of prices is warranted. However, phasing out subsidies and liberalising prices inevitably exerts upward pressure on prices. Given the magnitude of subsidies in many countries of the region, the potential for price increases as a result of cuts in subsidies is significant. This is illustrated by the example of Jordan, where annual inflation increased from around 5% in 2007 to almost 15% in 2008. This inflationary pressure was the result not only of high global commodity prices but also of the phasing out of oil subsidies, which was urgently needed in view of the rising budgetary cost of the subsidies. In Syria, this could also become an important issue, as declining oil revenues may lead to the phasing out of subsidies and to the introduction of VAT (after strengthening the tax administration). There is broad agreement that a direct impact (or first-round effects) on inflation is inevitable and should not necessarily be counteracted by a monetary tightening. However, central banks need to remain vigilant and ensure that the initial spike in price levels does not translate into a deterioration of inflation expectations and second-round effects, for example, with regard to wage developments. A credible monetary policy framework helps to contain such second-round effects and to anchor inflation expectations.

The limited role that automatic stabilisers tend to play in most Mediterranean countries in addressing cyclical developments is another relevant issue for monetary policy. Automatic or built-in

stabilisers in the budget mainly work via taxes, in particular direct taxes, and transfers related to unemployment and other income support schemes, which are sensitive to cyclical developments. In most countries of the region, direct taxation and transfers play a much more limited role than, for example, in EU countries. As a result, automatic stabilisers can be expected to be relatively weak. In the face of cyclical fluctuations this leaves countries with two policy options: 1) to resort to discretionary fiscal policies for stabilisation purposes, although these pose severe problems of their own and for which the scope may be limited (see above); 2) to assign a more active role to monetary policy, which may be problematic, as for example it could at times conflict with price stability as the primary objective of monetary policy. The latter is not even an option for countries with a fixed exchange rate.

The budget of some countries appears to display a low degree of flexibility, which leaves little margin for manoeuvre for the authorities, inter alia as a result of a high share of 'pre-committed' spending outlays, for example, on wages and salaries and interest payments, which are difficult to curb in the short term. The prevalence of fiscal rigidities in the budget structure of many countries, in combination with difficulties in raising higher tax revenues, hampers the implementation of discretionary fiscal adjustments for stabilisation purposes and leaves relatively little room for fiscal policy to react to external shocks, for example to a shortfall of donor support, or to address new spending priorities. It makes the option of tightening fiscal policy more complicated, if such an adjustment is needed to address widening external imbalances. Fiscal adjustment may then mainly come at the expense of capital expenditure,[27] or, if no adjustment takes place, macroeconomic stability may be jeopardised.

The role of fiscal rules

Many countries – in the Mediterranean region and elsewhere – find it difficult to consolidate their budgets and pursue sound fiscal policies despite the well known negative consequences of high fiscal deficits and rising public debt. This is primarily the result of political economy factors. Governments have a tendency to finance public expenditure via debt issuance to a greater extent than is warranted from a purely economic point of view.[28] This leaning towards excessive public deficits is due to the intertemporal redistribution involved in deficit financing, which shifts part of the fiscal burden from present to future

generations, and to the 'common-pool problem', as special interest groups do not internalise the impact of their competing demands on the overall budget. A large body of economic literature has provided theoretical and empirical evidence for this bias in favour of deficit financing.[29]

The experience with the 'deficit bias' driven by political economy factors has drawn attention to fiscal rules as a possible remedy. Fiscal rules provide a permanent constraint on fiscal policy through simple numerical limits on variables such as budget deficits, public debt and expenditure. Such numerical, or quantitative, rules aim to limit political discretion and can act as a commitment device to prevent short-term political considerations leading to excessive spending and deficits. They can be supported by procedural or institutional fiscal rules, which are mainly designed to improve budgetary institutions and management.[30]

Fiscal rules are not a panacea and involve many problems of their own. These include appropriately balancing simplicity and transparency on the one hand against flexibility and room for discretion on the other, ensuring effective enforcement and avoiding incentives for 'creative accounting' to artificially meet numerical targets. However, it is increasingly acknowledged that carefully designed fiscal rules can constitute a useful device for fostering fiscal discipline. Indeed, over the past two decades, many countries have adopted fiscal rules. In early 2009, there were around eighty countries with national or supranational fiscal rules, compared to fewer than ten in the early 1990s.[31] While fiscal rules were initially adopted mainly in advanced economies,[32] over recent years a growing number of emerging market and developing countries have introduced them as well.

In the Mediterranean region, however, fiscal rules are not widespread at present despite the fiscal vulnerabilities identified above. Very few countries are using quantitative targets for key fiscal indicators in the medium term. Israel is the sole country with a fully fledged fiscal rule. The cornerstone of Israel's rule-based fiscal framework is a limit on the annual increase in central government real expenditure of 1.7% accompanied by annual deficit ceilings.[33] Jordan does not have a fully fledged fiscal rule but a legislated public debt-to-GDP ceiling of 60% by end-2010. Among Mediterranean oil-exporting countries, only Algeria has some rudimentary elements of a rule-based policy, in the form of transfers to the stabilisation fund of those hydrocarbon revenues that are generated if oil prices are above the price on which the budget is based.[34]

One of the reasons for the limited role of fiscal rules in the region may be low fiscal transparency. A high degree of fiscal transparency is a necessary – albeit not sufficient – condition for the effective implementation of fiscal rules. Accordingly, transparency and data quality would need to be improved in most countries before a fiscal rule could become a meaningful device to guide fiscal policy.

Furthermore, the specific challenges for fiscal policy in oil-dominated economies (Box 3.2) have to be considered when formulating fiscal rules in oil-exporting countries. This applies in particular when choosing appropriate fiscal indicators and taking into account the volatility of oil prices and the exhaustibility and uncertainty of oil reserves.

As regards the former, the overall budget balance as a ratio of GDP has to be interpreted with even greater caution than in non-oil economies. For example, in a period of rising oil prices the deficit-to-GDP ratio may decline in spite of expansionary fiscal policies featuring expenditure increases or a reduction in non-oil revenues. Higher oil revenues (and higher oil GDP) may conceal fiscal expansion. The period 2003–8 has provided an ample example of this phenomenon. An assessment of the underlying fiscal policy stance on the basis of the overall balance could therefore be misleading; and a fiscal rule based on an unqualified deficit-to-GDP ratio could even exacerbate and institutionally enshrine pro-cyclical behaviour. Thus, other indicators insulating the budget balance from oil price developments appear more appropriate as a basis for numerical fiscal rules in oil-exporting countries, in particular the non-oil budget balance/non-oil GDP ratio.[35] Taking into account the volatility of oil prices and the exhaustibility and uncertainty of oil reserves suggests a generally conservative fiscal rule, such as the 'bird-in-the hand' rule or the 'permanent consumption' rule.[36]

Effective fiscal rules have the potential to support macroeconomic stability also in the Mediterranean region. This applies to both non-oil-exporting countries, given the pressing need for budget consolidation in many of them, and oil-exporting countries, given revenue volatility, the tendency to conduct pro-cyclical fiscal policies and intergenerational equity and sustainability issues. Anchoring fiscal policy through an effective fiscal rule not only may be conducive to reducing fiscal deficits but also can help to make fiscal policy more predictable. Effective fiscal rules thus reduce the uncertainty and potential adverse effects on monetary policy stemming from the fiscal sector and can underpin the credibility of monetary frameworks.

3.4 Conclusions

High fiscal deficits have characterised the economic history of many advanced as well as emerging market and developing countries, including those in the Mediterranean region. Many Mediterranean countries exhibit specific fiscal features and challenges such as high defence expenditure, dependence on some form of donor support or concessional financing and weak tax bases. They also face others that are common to many advanced and emerging market economies, in particular concerning deficit and debt reduction and the maintenance of fiscal discipline.

In the Mediterranean region, most countries have made progress in reducing budget deficits and public debt, but many still face significant fiscal challenges. This is particularly true for non-oil-exporting countries still exhibiting very high deficits and debt levels, such as Lebanon. The fiscal positions of oil-exporting countries in the region – with the exception of Syria, which faces a depletion of oil reserves – are more favourable than those of non-oil exporters, as they used the period of high oil prices between 2003 and mid-2008 to reduce public debt and accumulate foreign assets. In the long run, they face the challenge of diversifying their economy and sources of revenue.

Reducing fiscal vulnerabilities and fiscally driven threats to macroeconomic stability requires a reduction of public indebtedness, including contingent liabilities. This can only be achieved via the reform of public finances involving the strengthening of public finance management, continued fiscal discipline and sustained economic growth. Enhancing and maintaining fiscal discipline will be facilitated by improving the institutional framework in which fiscal policy operates, for example, via more effective budgetary management and transparency, and eventually via fiscal rules, which so far are not being widely used in the region. Such rules might be particularly beneficial in countries that aim to introduce IT frameworks, as they could help to anchor fiscal policy and reduce the unpredictability of fiscal outcomes. Moreover, oil-exporting countries could benefit from effective fiscal rules that prevent pro-cyclical fiscal policies, notably in boom times of high oil prices, especially if monetary policy is constrained in curbing inflationary pressure due to prevailing exchange rate regimes.

Evidence from both advanced and emerging/developing economies suggests that a monetary policy credibly committed to price stability and based on a sound monetary framework is the best contribution that central banks can make to macroeconomic and financial stability,

to better fiscal outcomes and ultimately to economic growth. A monetary policy aimed at achieving and maintaining price stability, which is fully credible in the commitment to this primary objective, is conducive to low nominal and real interest rates. Lower interest rates alleviate the burden of interest expenditure in the budget and create room for deficit reduction, more productive expenditure or tax reduction. This is particularly important in countries with high debt levels such as those in the Mediterranean region. In addition, such a policy conducted by an independent central bank that is prohibited from financing budget deficits makes it clear to fiscal policy-makers that no monetary accommodation of unsound fiscal policies can be expected. This may, in turn, contribute to fiscal discipline.

Notes

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1. The countries covered are Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Mauritania, Morocco, Syria and Tunisia. These are the participants or observers in the EU's Barcelona process: Union for the Mediterranean (UfM) that are located on the southern and eastern shores of the Mediterranean. This chapter does not cover member countries of the UfM that are EU candidate or potential candidate countries (Albania, Bosnia-Herzegovina, Croatia, Montenegro and Turkey). It also does not cover the West Bank and Gaza. While being one of the EU partners in the UfM, the West Bank and Gaza is not a sovereign state with a national currency and monetary policy, and thus exhibits a number of highly specific fiscal and economic features.
2. Egypt also produces oil and gas and has relied on hydrocarbon revenues, but the importance of hydrocarbons for the budget, exports and GDP is comparatively smaller. Thus, it is grouped in this chapter as a non-oil-exporting country. Likewise, the production of hydrocarbons in Tunisia and in Mauritania is too small (Tunisia) or too recent with uncertainties about potential (Mauritania) for these two countries to be grouped with oil exporters.
3. Cyclically adjusted budget balances to analyse the underlying fiscal stance are not available for Mediterranean countries. This points to data quality as a key issue, which limits fiscal analysis of the region. Compliance with fiscal standards and transparency are relatively low, despite improvements over recent years. In some countries, transparency is hampered in particular by limited statistical coverage of government activities, which implies the existence of significant quasi-fiscal activities and contingent liabilities. In general, the non-oil-exporting countries in the region have better fiscal statistics than the oil exporters.

4. Defence expenditure in 2008 accounted for 10.6% of GDP in Jordan, 8.8% in Lebanon and 7.9% in Israel.
5. For example, in Egypt fuel and food subsidies are high and increased sharply in 2007–8, reaching around 20% and 5% of total expenditure, respectively. In 2008–9, the share of food subsidies further increased to 6%. In the absence of a developed and well targeted welfare system, subsidies are a major tool of social policy in the region. In most countries, wages and salaries constitute the largest public spending. In Tunisia, they represent around 45% of total expenditure (i.e. around 12% of GDP). High spending on wages and salaries is partly attributable to attempts by governments to reduce high unemployment by public sector employment.
6. See, for example, Abed and Davoodi (2003) and Hakura (2004).
7. Direct tax revenues are particularly low in Libya (around 2% of GDP) and Lebanon, Jordan and Syria (around 4%). At the other end of the spectrum, direct tax revenues are high in Tunisia and Morocco (around 9% of GDP) and Israel (around 15%). The latter figure is in line with levels in advanced economies.
8. For an overview of the channels in emerging market economies and the existing literature on the topic, see Zoli (2005).
9. This scenario is particularly relevant for emerging market economies. See Blanchard (2004) for Brazil and the contribution by Ersel and Özatay on Turkey in this book.
10. Abed (2006) characterises the reforms between the mid-1980s and the mid-1990s as 'reforms by necessity', as opposed to the 'reforms by choice' that were implemented after 2000 in many Mediterranean countries.
11. In most Mediterranean countries, the weight of food items in the CPI basket is in the range 36–44%. Notable exceptions are Israel and Lebanon, where food has a share of below 20% in the national CPI basket, and Mauritania, where the weight of food exceeds 50%. For comparison, in the euro area, the processed and non-processed food components make up 19.5% of the basket of the Harmonised Index of Consumer Prices (HICP). The impact of rising food prices on inflation in the region would have been even more pronounced if food price increases had not been cushioned by widespread subsidies, which, however, constitute a major budgetary burden in several countries and moreover lead to economic distortions.
12. See IMF (2003) and the overview of studies on public debt in emerging markets given there.
13. See Sturm and Sauter (2010) on the impact of the global financial crisis and recession on Mediterranean countries, and in particular on their banking sectors.
14. See Robalino (2005). While demographic trends are still favourable with regard to the financing of pension systems – unlike the position in most industrialised countries – many systems in the region appear financially unsustainable, reflecting high implicit rates of return on contributions. These result from a misalignment of retirement ages, benefits and contribution rates, which imply large and unaffordable pension promises. Implicit liabilities are estimated to be as high as 175% of GDP in Jordan, 130% in Morocco, and in the range 50–100% in Algeria, Egypt, Libya and Tunisia.

Thus, even with favourable demographics, pension systems might eventually run into trouble in the absence of reforms. A number of countries, including Egypt, Jordan and Morocco, are in the process of implementing pension reforms.

15. In particular, a reform of the electricity company (Électricité du Liban, EdL) is key. Public transfers to EdL constitute a serious drag on the budget (17% of government revenue). Without those transfers – USD 1.5 billion in 2008, equivalent to 5.2% of GDP – the overall public deficit would be only around 5% of GDP, and the primary position would record a strong surplus.
16. The magnitude of fiscal stimulus programmes has been estimated to be approximately 1.5% of GDP in Tunisia and Egypt, 1.35% in Israel and 0.5% in Morocco (IMF and national sources).
17. The most common definition of fiscal space is 'room in a government's budget that allows it to provide resources for a desired purpose without jeopardising the sustainability of its financial position or the stability of the economy' (see Heller, 2005). While the term has been frequently used in the context of providing external assistance to developing countries (e.g. the Millennium Development Goals), it has also been applied to the ability of countries to resort to fiscal policy for stabilisation purposes, in particular in the context of the global financial crisis and recession. Government debt-to-GDP and deficit-to-GDP ratios are the most basic determinants of fiscal space, even though other factors need to be taken into account as well, for example the capacity to raise revenues, public assets, the level of real interest rates and contingent liabilities.
18. See Sturm and Sauter (2010).
19. See Baig et al. (2006).
20. See, for example, Bracke et al. (2011) on preconditions for inflation targeting.
21. See Sturm et al. (2009).
22. See Note 21.
23. The only major oil exporters with a floating exchange rate and an inflation targeting framework are Norway and Mexico.
24. See Sturm et al. (2008) on inflation developments in GCC countries.
25. Given the constraints on the independent use of interest rates to curb inflation, several central banks tried to tighten monetary conditions by raising reserve requirements and stepping up the issue of central bank bills to mop up liquidity. Several oil-exporting countries, in particular in the GCC, have also resorted to administrative measures to contain inflation. For example, they introduced ceilings for rent increases.
26. See Section 3.2 above for key features and Sturm and Gurtner (2007) for a detailed analysis of public revenue and expenditure structures in Mediterranean countries.
27. A recent example in the region is Jordan, which in 2009 mainly cut capital expenditure in response to rising fiscal and balance of payments pressure caused by the economic downturn and a shortfall of external grants.
28. Financing public investment, tax smoothing and smoothing business cycles are the major normative arguments proposed by economic theory in favour of budget deficits.

29. The seminal contribution on the deficit bias from a political economy point of view is that of Buchanan and Wagner (1977). Later literature has increasingly looked at specific features of democratic systems that are particularly conducive to excessive deficits, such as individual election systems and the degree of political polarisation (see, for instance, Roubini and Sachs, 1989; Grilli et al., 1991; Corsetti and Roubini, 1993; and Alesina and Perotti, 1995). For an overview of the literature, see Schuknecht (2004). Most of this literature concerns countries with democratic political systems, where elections – and the efforts of competing parties to win electoral support through expenditure-enhancing or revenue-reducing fiscal measures – are the driving force behind the deficit bias. Much less is known about the political economy with regard to public deficits in political systems where elections are not the ultimate source of political power and legitimacy. While this topic would deserve further research, there is sufficient evidence to suggest that in such systems also persistent and high fiscal deficits are mainly driven by political economy factors.
30. See Hallerberg et al. (2004), who refer to procedural rules as a 'delegation' approach to fiscal governance, where significant strategic powers are delegated to a decision-maker who is less bound to special interests, typically the finance minister. By contrast, quantitative rules are consistent with a 'contract' approach, where parties involved in the budgetary process agree on and subsequently respect a set of key budgetary parameters.
31. IMF (2009).
32. The EU's Stability and Growth Pact adopted in 1997 is the most prominent example.
33. See Fischer and Flug (2007) on Israel's experience with fiscal rules. While Israel had already attempted to move to a more rule-based fiscal policy in 1991 with the Deficit Reduction Law, this attempt was seen as having little success in controlling fiscal outcomes on a multi-year basis and anchoring fiscal policy. In 2003 the focus of the rule shifted from deficits alone to expenditure and deficits, and this seems to have contributed to more fiscal discipline. A further modification of the rule is under discussion.
34. Algeria, like many other oil-exporting countries, bases its budget on conservative oil price assumptions (see Sturm et al., 2009).
35. See Barnett and Ossowski (2002) on the non-oil balance/non-oil GDP ratio as a fiscal indicator in oil-producing countries. See Sturm and Siegfried (2005) for a discussion on fiscal rules in oil-dependent countries in the Gulf region.
36. See Bjerkholt (2003), who suggests a 'bird-in-the-hand' rule to counter the uncertainty of a country's oil wealth by limiting non-oil deficits to the return on accumulated assets. A somewhat less conservative approach is the so-called permanent consumption rule (see Balassone et al., 2006). According to this approach, the optimal non-oil deficit is equal to the return on the present discounted value of oil wealth (which is less than the annual flow of oil revenues, i.e. also in this case financial assets need to be accumulated). The 'bird-in-the-hand' rule has the advantage that it does not require estimates

of oil wealth. The 'permanent consumption' rule has the advantage that it allows for some 'frontloading' of public expenditure, which may be more appropriate for countries with large development needs, for example, in infrastructure.

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4

Capital Mobility and the Optimal Monetary Policy Rule: A Tunisian Case Study

Mahmoud Sami Nabi and Ndiamé Diop

4.1 Introduction

Capital account liberalisation is likely to boost growth through a range of direct and indirect channels: 1) an increase in foreign direct investment (FDI) flows, which may generate learning-by-doing effects, technology transfers and positive effects on domestic investment (see Edison et al., 2004, for an analysis of the relationship between FDI and growth); 2) a greater scope for local firms' internationalisation; 3) the development of the stock market (Quinn and Toyoda, 2006); 4) the entry of foreign banks, which may lead to greater competition in the domestic financial sector. Nearly all studies based on macro or sector-level data find that financial development, measured by the size of financial intermediation or of external finance relative to GDP, has a significant positive impact on growth, either directly, by raising factor productivity, or indirectly, by stimulating the accumulation of physical and knowledge capital (Pelgrin et al., 2002; Rousseau and Vuthipadadorn, 2005).

It is, however, acknowledged that capital account liberalisation may also generate negative effects on growth, through three possible channels. First, if greater access to world capital markets improves the ability to smooth consumption, it could cause a reduction in 'precautionary' savings, which may reduce growth.[1] Second, if macroeconomic discipline is not maintained, increased volatility may distort investment decisions (by blurring the signal associated with relative price changes) or delay them (as a result of the irreversibility effects); in either case, this would negatively affect growth. Moreover, given the experience of many countries in recent years, the need for prudent macroeconomic

management should be emphasised.[2] Third, to the extent that FDI takes place in sectors where some production inputs (such as land) are scarce, it may lead to a sustained misalignment in relative prices, which in turn may be detrimental to growth.[3]

Like many other developing countries, Tunisia has opted for gradual capital account liberalisation. Its strategy involves a three-phase approach. The first phase involves removing all restrictions on FDI by non-residents and allowing limited non-resident investment in local currency government securities. The second phase involves steps that require continued progress towards modernising and strengthening Tunisia's banking system and the adoption of a more flexible exchange rate regime and a market-based monetary policy framework. The third and final phase, enabling residents to lend to non-residents, requires a robust financial sector and a strong balance-of-payments position. The second phase rests on the lessons that emerge from the experiences of capital account liberalisation in developing countries (Fischer, 2001; Rose, 1994). Tunisia has also announced that it will move to a more flexible exchange rate regime without a fixed or pre-announced target or band, and that it will adopt inflation targeting (IT) as a new monetary policy regime.[4] However, some economists doubt the efficiency of strict IT in the context of increasing capital account liberalisation and exchange rate flexibility in developing or emerging countries (Mishkin and Savastano, 2001). Calvo and Mishkin (2003) suggest that central banks in emerging economies that are vulnerable to 'sudden stops' of capital inflows and repeated exchange rate collapses should be subject to 'constrained discretion' through IT, making it harder for them to follow an 'overly expansionary monetary policy'.

According to Grenville (2000: 5), the Deputy Governor of the Reserve Bank of Australia, 'in the face of temporary exchange rate shocks, the authorities should not react but in the face of a permanent or structural change in the exchange rate, they should. The trick is knowing, as the exchange rate moves, whether it is temporary or structural. In practice, it would seem sensible to assume that at least some of the movement is structural, or at least will last long enough to either damage price expectations, or affect economic activity [...]'. Rakesh Mohan, the Deputy Governor of the Reserve Bank of India, asserts that 'a single objective for monetary policy, as is usually advocated, particularly in an inflation targeting framework, is a luxury that India cannot afford, at least over the medium term' (Mohan, 2007: 1). Aizenman et al. (2008) find that IT emerging economies are in fact following a 'mixed IT strategy' where the commitment to target inflation is coupled with real exchange rate

stabilisation. Park (2008) confirms that the Korean interest rate responds not only to expected inflation but also to the output gap and to changes in the real effective exchange rate. Although Korea adopted IT in 1998, its central bank, according to Park, continues to stabilise the exchange rate with sterilised invention in the foreign exchange market and/or controls on foreign capital movements in the case of large exchange rate fluctuations. Therefore, there is evidence that developing countries targeting inflation are adopting a rather flexible regime and have not abandoned exchange rate control.

This chapter tries to analyse the effect of the degree of capital mobility on the choice of IT regime by a developing country like Tunisia. To this end we propose a modified version of Ball (1999) to allow for different degrees of capital mobility. In this framework the monetary policy affects inflation through two channels. The first one is a direct channel that takes effect over one period and passes through the direct effect of real exchange rate variability on inflation. The second one is an indirect channel that takes effect over two periods. It could be illustrated as follows: a monetary contraction reduces output demand (due to the reduction of domestic and foreign demand) in the next (first) period; the output reduction, in turn, reduces inflation in the following (second) period through the Phillips relation.

In line with Ball (1999) we consider two possible IT regimes. In the first one, which we call 'pure' IT, the central bank targets inflation. In the second one, which we call 'adjusted' IT, the central bank targets inflation adjusted for temporary exchange rate movement. Under the two regimes the central bank brings inflation (or 'adjusted' inflation) back to target after a shock by choosing the optimal targeting horizon and optimal policy rule. Interestingly, we show that, under 'pure' IT, an increase of the degree of capital mobility has two opposite effects. First, it reduces the variability of output and the exchange rate when the economy is exposed to an inflationary shock from the supply side. This is because the higher sensitivity of capital flows reduces the necessary adjustment of the interest rate. Second, the variability of the exchange rate and output increases during the periods following an inflationary shock caused by a shift in investors' confidence in the economy. However, under an 'adjusted' IT regime, less capital mobility could be preferable because it generates less exchange rate volatility during the first period.

The chapter argues that, for a given degree of capital mobility, the optimal targeting horizon is longer when the central bank gives a bigger weight to lowering output volatility relative to inflation volatility. In addition, the chapter shows that the effect of an increase in capital mobility

on the optimal targeting horizon depends on the relative weight of inflation versus output in the central bank loss function: when output is relatively more important than inflation, it is shown that the optimal targeting horizon is shorter when capital mobility is higher, and vice versa.

The remainder of the chapter is structured as follows. Section 4.2 presents Tunisia's approach towards capital account liberalisation. Section 4.3 outlines the new exchange rate regime and monetary framework that Tunisia is aiming for. In Sections 4.4 and 4.5 the modified version of Ball (1999) is presented and calibrated, then the effect of capital mobility on the variability of the exchange rate and output under 'pure' IT and 'adjusted' IT regimes is discussed. Section 4.6 deduces the effect of capital mobility on the optimal targeting horizon as well as on the optimal policy rule. Section 4.7 summarises the main conclusions.

4.2 Tunisia's capital account liberalisation

Tunisia's approach to capital account liberalisation is gradual, involving a progressive dismantling of restrictions on domestic financial and international transactions. However, although considerable *de facto* liberalisation took place in the early years of this strategy, restrictions remained on many categories of capital account transactions, including inward direct and portfolio investments.[5]

Tunisia's current strategy regarding capital account liberalisation involves a three-phase approach. The first phase involves removing all restrictions on FDI by non-residents and allowing limited non-resident investment in local currency government securities. In 2005, for instance, non-residents were given further latitude to participate in the local Treasury bill market; borrowing abroad was fully liberalised for rated financial institutions and restrictions were eased on non-financial institutions;[6] and authorisations were abolished on most foreign acquisitions of securities carrying voting rights in Tunisian companies. In 2006 measures adopted by the Government included the authorisation given to non-residents to purchase up to 10% of the obligations issued by rated or listed firms and to buy land in industrial and tourism zones; the liberalisation of medium- and long-term external borrowing for listed firms; an increase in the amounts transferable without restriction by exporters for investments abroad; an increase in allowances for personal and business travel; and a relaxation of restrictions on foreign exchange accounts. In fact, except for some remaining restrictions on inward FDI, the first phase in the capital liberalisation strategy can be deemed close to completion.

The second phase involves steps that require continued progress towards modernising and strengthening Tunisia's banking system, and the adoption of a more flexible exchange rate regime and a market-based monetary policy framework. It will entail liberalising outward FDI (that is, Tunisian investment abroad), portfolio investment by institutional investors, and inward portfolio investment in debt instruments. The third and final phase involves steps that require a robust financial sector and a strong balance-of-payments position, such as lending by residents to non-residents. Tunisia intends to continue with the second and third phases to gradually liberalise external capital flows, but the calendar is not clear. It depends not only on exchange rate and monetary policy reforms, but also on a number of complementary institutional reforms, such as an improvement in the transparency of firms' accounts, for instance, to spur stock market activity.

4.3 Towards more exchange rate flexibility and a new monetary framework

Changes in the exchange rate regime

Capital account liberalisation in many developing countries shows that increased capital mobility limits the effectiveness of fixed exchange rate regimes (Fischer, 2001; Rose, 1994). Thus, many countries have moved to a more flexible exchange rate regime without a fixed or a pre-announced target or a band. In this new regime, the central bank continues to intervene in the foreign exchange market in order to limit exchange rate volatility and reduce the destabilising effect of speculative short-term capital inflows (Calvo and Reinhart, 2002; Reinhart, 2000).[7] The central bank's intervention is particularly justified when banks or other domestic residents have large open positions in foreign exchange (Obstfeld, 2009).

Greater exchange rate flexibility may mitigate not only the short-term volatility of capital inflows, but also the impact of external shocks in general. Based on panel data regressions for 157 countries covering the period 1970–2001, Edwards (2004) found that countries with more flexible exchange rate regimes were better able to accommodate shocks stemming from a current account reversal (defined as a reduction in the current account deficit of at least 4% of GDP in one year) than countries with more rigid exchange rate regimes. Broda (2004) and Perry and Servén (2003) found similar results. Finally, there is substantial empirical evidence suggesting that the costs of adjustment to terms-of-trade

shocks are significantly higher under a pegged exchange rate (or a heavily managed float) than under a floating rate. In the former case, such shocks typically lead to a gradual and modest real depreciation and a sizable contraction in output in the short run; in the second, by contrast, the real depreciation is immediate and sustained, and the output loss tends to be small.

Like many emerging economies, Tunisia has managed to increase the flexibility of the exchange rate in parallel with measures to increase capital mobility. During the 1990s, exchange rate policy in Tunisia was aimed essentially at maintaining a stable real exchange rate, through regular adjustments in the nominal exchange rate, against an undisclosed basket of currencies weighted according to the country's main trading partners and competitors.[8] Although there are well known problems associated with real exchange rate targeting, Tunisia's experience was broadly successful in terms of inflation performance.[9]

Since early 2000, in the context of its strategy of increased regional and global integration, Tunisia has begun to move gradually away from its crawling peg regime towards a more flexible exchange rate arrangement. Its current exchange rate regime is a managed float with no predetermined path and no official fluctuation band; the value of the dinar is determined in an interbank foreign exchange market. There has been significant movement in the exchange rate in recent years. Between January 2000 and March 2008, the nominal effective exchange rate of the dinar depreciated on a cumulative basis by about 22%. At the same time, the volume of interventions by the Central Bank of Tunisia (BCT) in the foreign exchange market has declined in recent years.

Nevertheless, and although there are no explicit fluctuation bands, the degree of flexibility of the exchange rate remains limited, especially in 2005–7. The standard deviation of the nominal effective exchange rate stood at 1.31 in 1998–2000, 4.63 in 2001–4, and 2.34 in 2005–7.

The transition to an inflation targeting regime

Tunisia announced in 2006 its intention to move in the medium term towards an explicit IT framework. As shown in Agénor and Diop (2009), this was justified partly by the poor performance of monetary targeting (using M2) and partly because of the overall process of gradual capital account liberalisation. As a regime for monetary policy, IT has gained considerable popularity in middle-income countries in recent years.[10] However, implementing an IT regime creates a host of technical issues. Poor data on prices and real sector developments, the absence of reliable procedures for forecasting inflation, the difficulty of maintaining *de facto*

independence for the central bank, and the lack of an anti-inflationary history may make it difficult to establish a transparent framework for conducting monetary policy – thereby constraining the speed of transition towards an IT regime. Furthermore, the choice of an adequate IT regime depends on the degree of openness of the economy. The rest of the chapter looks into what IT regime is most appropriate for a country like Tunisia that is heading for full capital account liberalisation.

4.4 The inflation targeting regimes and the monetary policy rules

In this section we try to establish the foundations of a flexible IT rule taking into account real exchange rate variability. To this end we propose a modified version of Ball (1999) that includes a new feature: imperfect capital mobility. This departure from the perfect capital mobility hypothesis in Ball (1999) is pertinent for Tunisia, where capital account liberalisation is incomplete.

IT regimes

Rudebusch and Svensson (1999) argue that inflation targeting can be approximated by viewing the central bank as carrying out the minimisation of its loss function and setting its policy according to a specific optimal rule. Following Ball (1999) the central bank selects its monetary policy rule in order to minimise the following loss function:

$$L = V(y - \bar{y}) + \mu V(\pi - \bar{\pi}) \tag{1}$$

where y is the log of real output (measured as deviations from average levels), $\bar{y}$ is the potential output, π is inflation, $\bar{\pi}$ is the inflation target, μ is the relative weight attached to output versus inflation objectives and $V(x)$ is the variance of x. For given output and inflation targets, the variance of $(y - \bar{y})$ is equal to the variance of y; likewise, the variance of $(\pi - \bar{\pi})$ is equal to the variance of π. The targets $\bar{\pi}$ and $\bar{y}$ are indeed assumed exogenous. Thus the following loss function may be used instead:

$$L = V(y)\mu V(\pi) \tag{2}$$

Therefore, the central bank's objective is to smooth output and/or inflation volatility in the context of achieving the inflation and/or the output target.[11] We speak of IT when the central bank optimal policy rule

focuses on bringing inflation to its target after an optimal targeting horizon. This targeting horizon is obtained as a result of the central bank optimisation problem. In line with Ball (1999), we consider the two following types of disinflation paths based on targeting future expected inflation:

$$E\pi_{+1} = q\pi \tag{3}$$

$$E\pi^{*}_{+2} = qE\pi^{*}_{+1} \tag{4}$$

In equation (3) the central bank sets next period's expected inflation as a fraction $0 \leq q \leq 1$ of the current inflation. The monetary policy in this case will be called 'pure' IT. In equation (4) expectations concern the adjusted inflation π^{*}, which is a measure of inflation that filters out temporary exchange rate movements. The monetary policy in this case will be called 'adjusted' IT. In the two cases, finding the optimal targeting horizon is equivalent to determining $q \in [0,1]$ or the disinflation speed (the higher q is, the slower the disinflation process will be).

The aggregate model

The aggregate model where the central bank sets its optimal rule is analogous to that of Ball (1999) and is given by the following equations:

$$y = \lambda y_{-1} + \delta e_{-1} - \beta r_{-1} + \varepsilon \tag{5}$$

$$\pi = \pi_{-1} + \alpha y_{-1} + \gamma k (e_{-1} - e_{-2}) + \eta \tag{6}$$

$$e = -\theta (r + v) \tag{7}$$

Equation (5) is an open-economy IS curve where e is the log of the real exchange rate (a higher e means a real depreciation), r is the real interest rate and ε is a white-noise shock. Hence, demand for output is determined by its own lag, the lags of the real exchange rate and the real interest rate and a demand shock. Equation (6) is an open-economy Phillips relation where γk represents the real exchange rate pass-through. Equation (7) is a reduced form of the balance of payments equilibrium condition. It links the real exchange rate to the real interest rate. In the following subsection we give more details about the foundations of equations (6) and (7).

It is particularly important to notice that equation (7) departs from the one proposed in Ball (1999) since the parameter θ is endogenised.

Indeed, we will show that it depends on the degree of capital mobility and on the elasticity of the trade balance to the real exchange rate. Moreover, in contrast to Ball (1999) we will explicitly model the variable υ as a function of the structural characteristics of the economy and international investors' expectations.

a) The Phillips relation

The Phillips relation is obtained through the following steps. Inflation π is the average of inflation in imported goods π^m and inflation in domestic goods π^d weighted by γ and 1- γ, which are respectively the shares of imports and domestic goods in the price index:

$$\pi = \gamma\pi^m + (1-\gamma)\pi^d \tag{8}$$

We assume that domestic-goods inflation is determined by lagged inflation and lagged output:

$$\pi^d = \pi_{-1} + \alpha' y_{-1} + \eta' \tag{9}$$

We assume that domestic importing firms adjust their prices partially to changes in the real exchange rate with a one-period lag and also based on lagged inflation. They accept lower profit margins to preserve their market share. Therefore, we assume that the pass-through is incomplete and is captured by the coefficient $k \in]0,1]$:

$$\pi^m = \pi_{-1} + k(e_{-1} - e_{-2}) \tag{10}$$

Therefore, aggregate inflation is given by (6) with $\alpha = (1-\gamma)\alpha'$ and $\eta = (1-\gamma)\eta'$ a white-noise supply shock.

b) The balance-of-payments relation

We consider that the exchange rate regime is flexible and that foreign reserves are constant. Hence, the nominal exchange rate is determined by the equilibrium of the balance of payments:

$$TB + NKI = 0 \tag{11}$$

where TB and NKI denote trade balance and net capital inflows respectively. The trade balance TB increases with the real exchange rate e and foreign output y^* and decreases with the home output y:

$$TB = \zeta e - by + cy^* \tag{12}$$

while net capital inflows NKI is given by:

$$NKI = \rho\left(i - i* - \left(s^{e}_{+1} - s\right) + \varepsilon^{e}\right) \tag{13}$$

where i and i^* denote the nominal interest rate in the home and foreign countries respectively, and $s = e - p^* + p$ denotes the nominal exchange rate,[12] $s^{e}_{+1} - s$ denotes the international investors' expected change in the exchange rate and ε^{e} is a zero-mean random shock depending on the international investors' confidence in the country's solvency.[13] The parameter $\rho \geq 0$ represents the degree of capital mobility.[14] Note that perfect capital mobility is obtained in the limiting case $\rho \to \infty$ for which the uncovered interest parity condition is satisfied.[15] In the case of a country like Tunisia, a deficit on the trade balance (TB < 0) is offset by net capital inflows (NKI > 0). Substituting (12) and (13) in (11) and making simple algebraic manipulations we obtain the reduced form equation (7) linking the real exchange rate to the real interest rate. The difference from the analogous equation of Ball (1999) is the endogenisation of the parameter θ and of the variable υ as follows:

$$\theta = \rho / (\zeta + \rho) \tag{14}$$

$$v = \varepsilon^{e} - e^{e}_{+1} + \left(\pi^{*e}_{+1} - \pi^{*}\right) - \left(\pi^{e}_{+1} - \pi\right) - \frac{1}{\rho}\left(by - cy^{*} + \rho r^{e}\right) \tag{15}$$

Hence, the parameter θ depends on the degree of capital mobility ρ and on the elasticity ζ of the trade balance to the real exchange rate. It belongs to]0,1] and tends to 1 in the limiting case $\rho \to \infty$. Concerning the variable υ, it depends among other things on investors' confidence in the country's solvency ε^{e} and their expectations for the next period regarding the exchange rate, domestic inflation and foreign inflation. In the rest of the chapter we will consider a negative shift ($\varepsilon^{e} < 0$) in investors' confidence in the country's solvency ε^{e} as the sole source of variation of the variable υ. This negative shock will generate a decrease in capital inflows and may cause the depreciation of the domestic currency, while an increase in the interest rate attracts foreign capital and leads to an appreciation.

Monetary policy channels

Monetary policy affects inflation through two channels. The first one is a direct channel that takes effect over one period and passes through the direct effect of real exchange rate appreciation on inflation (Phillips relation (6)). The second one is an indirect channel that takes effect over two periods. It could be illustrated as follows: a monetary contraction

(interest rate increase) reduces output demand (due to the reduction of domestic and foreign demand) in the first period (IS relation (5)). The output reduction, in turn, reduces inflation in the second period consistently with the Phillips curve.

The monetary policy rules

In this section we characterise the monetary policy rules under the 'pure' IT regime (equation (3)) and 'adjusted' IT regime (equation (4)).

a) The policy rule under the 'pure' IT regime

Substituting equation (7) into (5) to eliminate r and shifting time subscripts forward we obtain:

$$y_{+1} = \left(\frac{\beta}{\theta} + \delta\right)e + \lambda y + \varepsilon_{+1} - \beta v \tag{16}$$

Shifting the time subscripts forward in the open-economy Phillips curve (6) we obtain:

$$\pi_{+1} = \pi + \alpha y + \gamma k\left(e - e_{-1}\right) + \eta_{+1} \tag{17}$$

From equation (17) it is clear that only an exchange rate appreciation (depreciation) will compensate a positive (negative) inflation shock in one period (output y is already determined, from the IS relation (5)). The explanation is that inflation in domestic-goods prices cannot be influenced in one period. Thus, as shown by equations (8) and (9), aggregate inflation could be influenced in one period only via inflation in imported goods. Substituting (16) in (3) and using (7) we obtain the following monetary policy rule:

$$r = \frac{1}{\gamma k\theta}\left[\alpha y + 1(1-q)\pi\right] + \frac{1}{\theta}e_{-1} - v \tag{18}$$

Note that the lower the disinflation speed (the higher q) the lower will be the reaction of the central bank to the inflation shock. This in turn will generate lower variation in the exchange rate and demand for output. Moreover, the reaction of the central bank to an exchange rate variation is lower when capital mobility is higher (θ higher). In practice, the monetary policy response to the exchange rate may depend on whether the central bank can use other instruments such as foreign exchange intervention, temporary capital controls, debt swaps and exchange rate-linked instruments to stabilise exchange rate expectations (Mohanty and Klau, 2004).

b) The policy rule under the 'adjusted' IT regime

The open-economy Phillips curve (6) can be rewritten as

$$\pi^{*} = \pi^{*}_{-1} + \alpha y_{-1} + \eta \tag{19}$$

where π^{*} is the adjusted inflation given by

$$\pi^{*} = \pi - \gamma k e_{-1} \tag{20}$$

Hence, the exchange rate is eliminated and the central bank needs only to affect its new target (equation (4)) through the output channel. We could interpret π^{*} as a measure of inflation that filters out direct but temporary effects of the exchange rate. Hence, when there is a temporary appreciation (depreciation) of the currency that could be caused by a sudden surge (outflow) of foreign capital the central bank should 'leave room' for the effects of exchange rate variations in the opposite direction. Note that the higher the exchange rate pass-through γk the larger the central bank's tolerance of deviation from the effective inflation target. Substituting equations (5) and (19) in (4) we obtain the following policy rule:

$$wr - (1-w)e = \alpha y + \beta\pi^{*} \tag{21}$$

where $w = \beta/(\beta+\delta)$; $\alpha = (1\text{-}q + 1)/(b+d)$; $b = (1\text{-}q)/[\alpha(\beta+\delta)]$. Thus, the policy instrument is a combination of r and e, which is called in practice the 'Monetary Conditions Index'. It could also be rewritten as follows:

$$r = \frac{1}{w}\left[\alpha y + b\pi + (1-w)e - b\gamma\kappa e_{-1}\right] \tag{22}$$

This optimal policy rule is coherent with the results of Hsing (2009), who showed that the overnight rates in the Philippines and Thailand react negatively to the current real exchange rate and positively to the lagged real exchange rate.

Substituting (7) in (21) and using it with (20) we obtain the policy rule in terms of the real exchange rate:

$$e = -zy - n\pi + \gamma\kappa n e_{-1} + \beta m\upsilon \tag{23}$$

where $m = \theta/(\beta + \delta\theta)$; $n = \theta\ (1 - q)/[\alpha(\beta + \delta\theta)]$; and $z = \lambda m + [n$.

4.5 Capital mobility and real exchange rate and output volatility

In this section we analyse the effect of capital mobility on the volatility of the exchange rate and output under the 'pure' and 'adjusted' IT regimes. We consider two different levels of capital mobility ($\rho = 0.47$ and $\rho = 3.8$) and a disinflation speed corresponding to $q = 0.76$. Using equations (7), (16) and (17) and the monetary policy rule (18) (respectively (22)) we derive the dynamic effect of two types of shock (a supply shock $\eta > 0$, and a shock to international investors' confidence $\varepsilon^e < 0$) under the 'pure' IT regime, on the one hand, and the 'adjusted' IT regime, on the other.

Calibration

A study by the International Monetary Fund (2007) shows that for the period 1995–2006, a 10% nominal depreciation of the dinar translates into an increase in inflation of about 0.9 percentage points, and takes about 18 months to complete. Thus, it is realistic to interpret a period in the model as a year. Besides, since the average inflation during this period was almost 4%, we could set the real exchange rate pass-through γk in our model at 0.15. Assuming that the share of imports in the price index γ is 0.2, then the initial value of the parameter k could be set to 0.75 (at least during the period 1995–2006). Following Ball (1999) we calibrate the output persistence coefficient λ as equal to 0.8; the Phillips curve slope α as equal to 0.4; and the total output loss from a one-point rise in the interest rate $\beta + \delta\theta$ as equal to 1. We follow Batini and Haldane (1999) by setting the ratio of interest rate to exchange rate coefficients in the IS curve β/δ equal to 4. The elasticity of the trade balance to the real exchange rate is assumed to be small with $\zeta = 0.2$. In addition, we set the initial degree of capital mobility at $\rho = 0.47 < 1$ (reflecting the current situation of the Tunisian economy) and will increase it to the limiting case of perfect capital mobility ($\rho \to \infty$). Hence, initially a 1% rise in the interest rate leads to 0.7% real appreciation ($\theta = \rho/(\zeta+\rho) = 0.7$), and 1% real appreciation in the case of perfect capital mobility ($\theta = 1$). Finally, for each value of θ it is possible to obtain the values of β and δ using the formulas: $\beta = 4/(4+\theta)$ and $\delta = 1/(4+\theta)$.

Supply shocks

a) Supply shock under the 'pure' IT regime

Figure 4.1 shows that inflation returns to target after many periods, generating large exchange rate and output oscillations. This is because

the exchange rate shifts in every period in order to offset the effects of previous shifts. Figure 4.2 shows that an increase in the degree of capital mobility (from $\rho = 0.47$ to $\rho = 3.8$) reduces the variability of output and the exchange rate with almost no effect on the inflation targeting horizon. This is due to the low initial adjustment of the interest rate

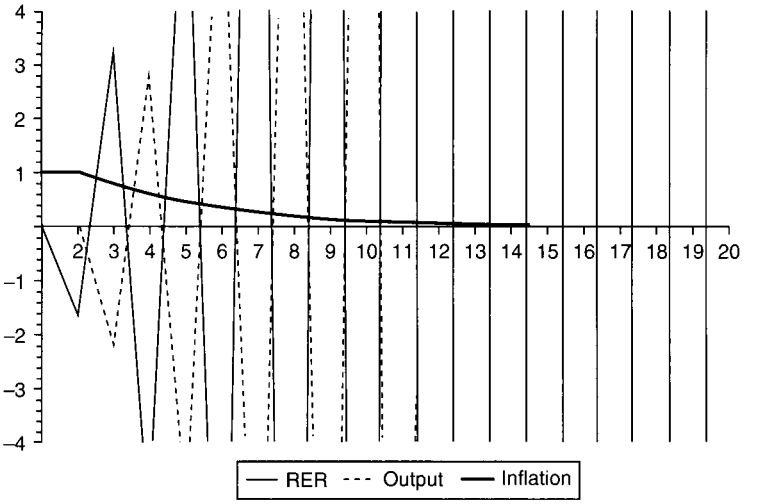

Figure 4.1 Response to a supply shock under 'pure' IT (r = 0.47; $q = 0.76$)

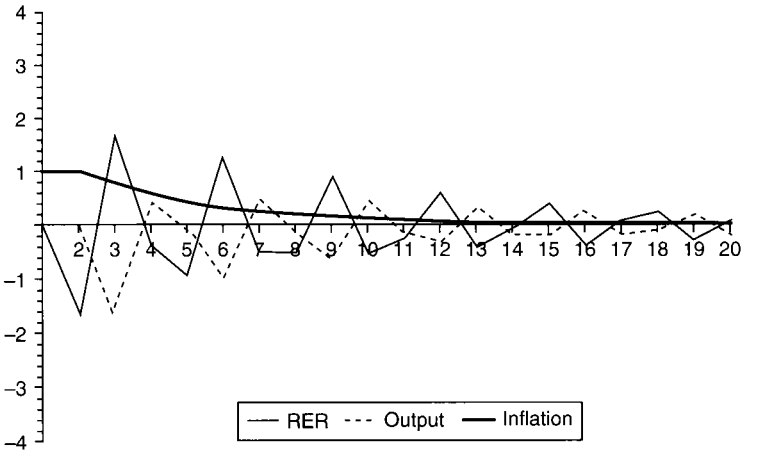

Figure 4.2 Response to a supply shock under a 'pure' IT regime (r = 3.8; $q = 0.76$)

needed to attract the same amount of capital inflow (relatively to the previous case).

Comparing Figures 4.2 and 4.5 shows that the central bank can reduce the IT horizon if it increases the disinflation speed (q goes from 0.76 to 0.1). However, this will be at the expense of higher variability of the exchange rate and output.

b) Supply shock under the 'adjusted' IT regime

Figures 4.3 and 4.4 present the results for two levels of capital mobility, $\rho = 0.47$ and $\rho = 3.8$. They show that, in the case of adjusted IT, the variability of the exchange rate and output is lower than in the case of 'pure' IT (Figures 4.1 and 4.2) for a given ρ and a disinflation speed θ equal to 0.76. We could conclude that, in the case of the 'adjusted' IT, the advantage of higher over lower capital mobility disappears in terms of lower exchange rate and output variability. Moreover, it has a negative impact during the second period in terms of higher real exchange rate appreciation. Therefore, lower capital mobility could be preferable in this case even if it generates relatively higher inflation during the first period following the supply shock.

Comparing Figures 4.3 and 4.6 shows that the Central Bank can reduce the IT horizon if it increases the disinflation speed (q goes from 0.76 to 0.1). However, this will be at the expense of higher variability of the exchange rate and output during the second period following the inflationary shock.

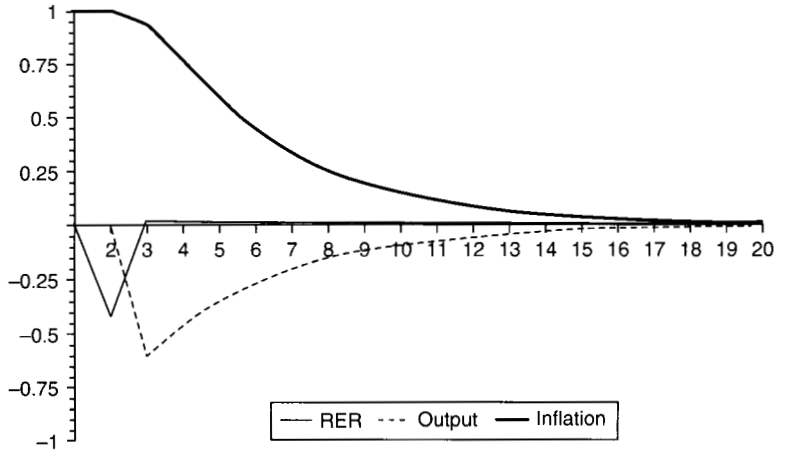

Figure 4.3 Response to a supply shock under the 'adjusted' IT regime ($\rho = 0.47$; $q = 0.76$)

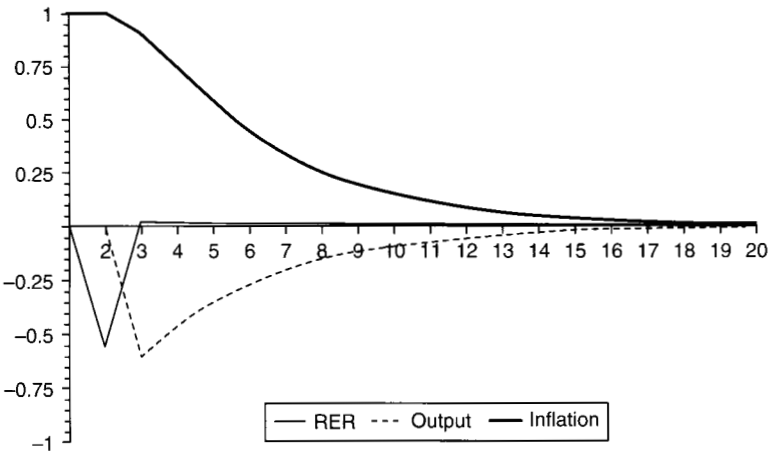

Figure 4.4 Response to a supply shock under the 'adjusted' IT regime ($\rho = 3.8$; $q = 0.76$)

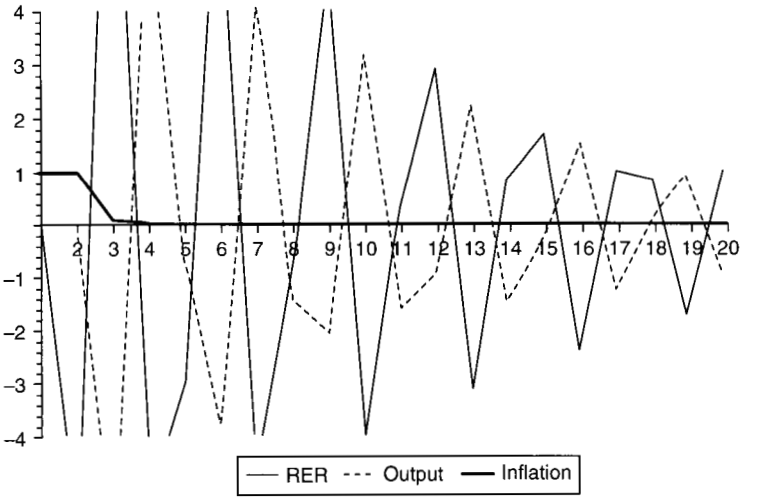

Figure 4.5 Response to a supply shock under a 'pure' IT regime ($\rho = 3.8$; $q = 0.1$)

Investors' confidence shock

As equations (13), (14) and (15) show, a shock to investors' confidence causes a sudden capital outflow and large nominal depreciation, which in turn generate inflation.

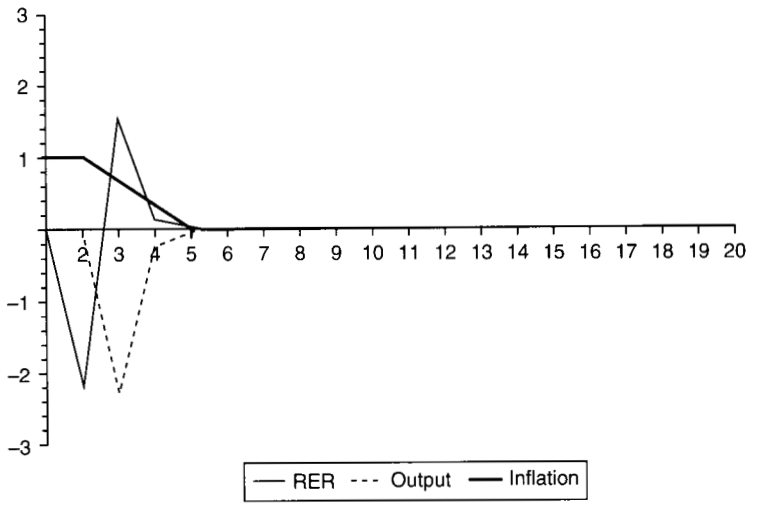

Figure 4.6 Response to a supply shock under the 'adjusted' IT regime ($\rho = 3.8$; $q = 0.1$)

a) Investors' confidence shock under the 'pure' IT regime

Figures 4.7 and 4.8 illustrate the negative effect of higher capital mobility on the variability of exchange rate and output during the first two periods after the shock. However, it is clear that from the date $t = 4$ there is more variability when capital mobility is lower.

Does limiting the variability of the exchange rate within a band favour more or less capital mobility? Figures 4.9 and 4.10 illustrate the two previous simulations when we constrain the real exchange rate to vary only within the band [-0.75; 0.75]. It is clear that this policy limits the negative effect of higher capital mobility in terms of volatility over the two first periods. However, this is done at the cost of reducing convergence on the inflation target.

b) Investors' confidence shock under the 'adjusted' IT regime

Figures 4.11 and 4.12 illustrate once again that the 'adjusted' IT regime limits the negative effect of higher capital mobility in terms of volatility over the first two periods. We could conclude that in the case of 'adjusted' IT, the advantage of higher over lower capital mobility in terms of lower exchange rate and output variability disappears. In addition, the inflation targeting horizon becomes longer (passing from 7 to 8 periods respectively for $\rho = 0.47$ and $\rho = 3.8$). Therefore, lower capital mobility could be preferable in this case.

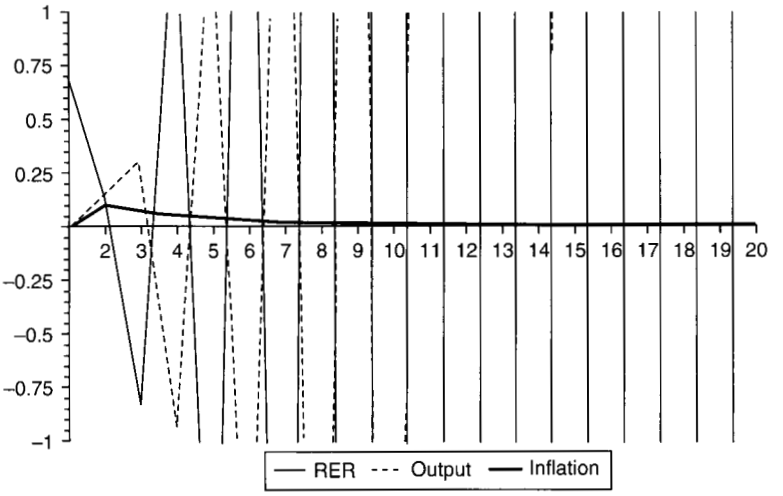

Figure 4.7 Response to a confidence shock under the 'pure' IT regime ($\rho = 0.47$; $q = 0.76$)

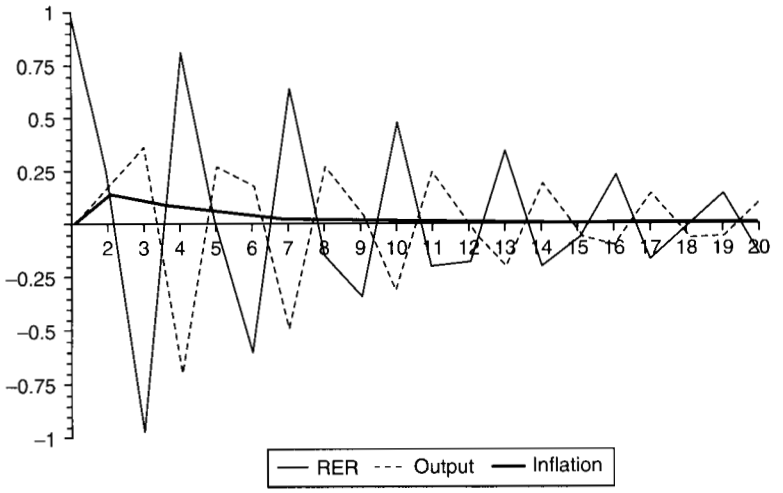

Figure 4.8 Response to a confidence shock under the 'pure' IT regime ($\rho = 3.8$; $q = 0.76$)

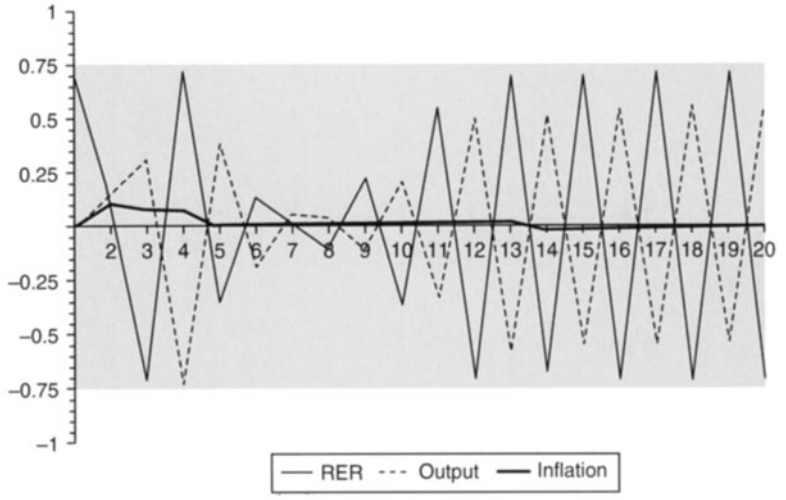

Figure 4.9 Response to a confidence shock under the 'pure' IT regime ($\rho = 0.47$; $q = 0.76$) and exchange rate band

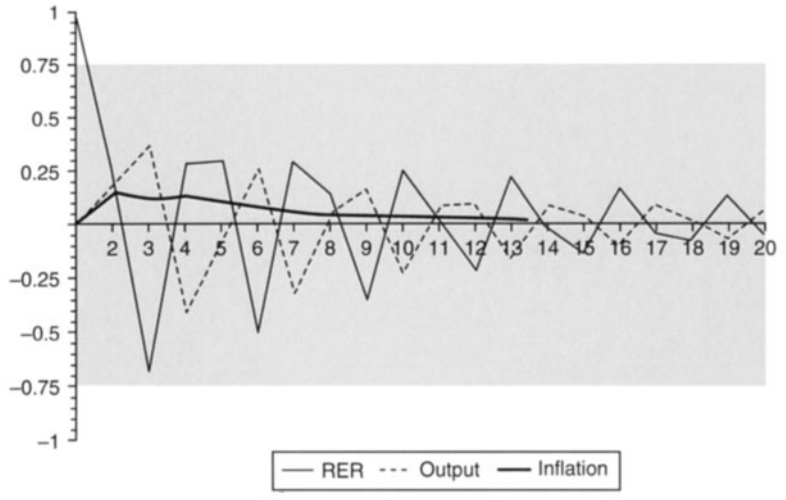

Figure 4.10 Response to a confidence shock under the 'pure' IT regime ($\rho = 3.8$; $q = 0.76$) and exchange rate band

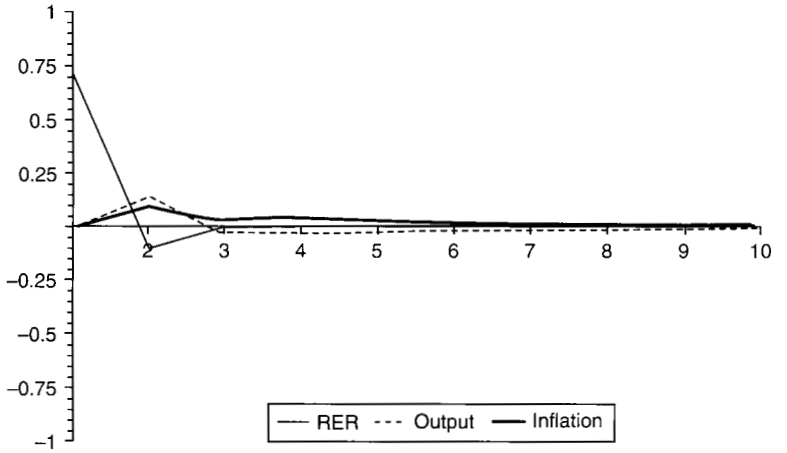

Figure 4.11 Response to a confidence shock under the 'adjusted' IT regime ($\rho = 0.47$; $q = 0.76$)

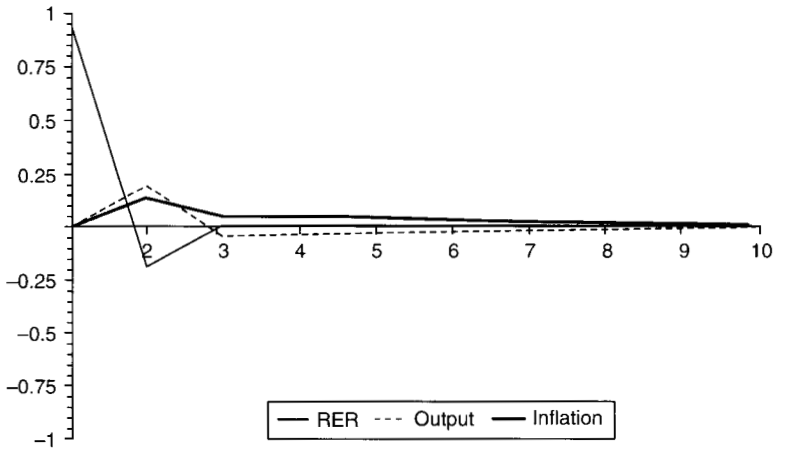

Figure 4.12 Response to a confidence shock under the 'adjusted' IT regime (r = 3.8; $q = 0.76$)

Summary of results

The above results show that targeting inflation adjusted for temporary exchange rate movement ('adjusted' IT regime) is more effective in terms of reducing output volatility than the 'pure' IT strategy. Table 4.1 summarises the effects of higher capital mobility under each regime

Table 4.1 A simple matrix of the effects of higher capital mobility

	'Pure' IT regime	**'Adjusted' IT regime**
Supply Shock	Lower variability of output Lower variability of exchange rate Relatively no effect on the disinflation process	Relatively no effect on the variability of output Higher real appreciation of the exchange rate during the second period Relatively no effect on the disinflation process
Investors' Confidence Shock	Higher variability of the exchange rate and output during the two first periods after the shock Lower variability of the exchange rate and output beginning with the third period after the shock Relatively no effect on the disinflation process	Relatively no effect on the variability of output Higher variability of the exchange rate during the second period Longer disinflation process

and for the two types of inflation shock. Under the 'adjusted' IT regime, it is clear that lower capital mobility is preferable. However, under 'pure' IT, higher capital mobility may be desirable.

4.6 Capital mobility and the optimal policy rule under the 'adjusted' IT regime

In this section we analyse the effects of the degree of capital mobility on the optimal targeting horizon (or equivalently the optimal disinflation speed) and the optimal policy rule under the 'adjusted' IT regime. We showed above that the optimal policy rule under the 'adjusted' IT regime is given by equation (23). In order to determine the optimal policy rule, the central bank should determine the optimal disinflation speed q^* which minimises the loss function $L(\mu,q) = V(y) + \mu V(\pi)$ under the constraints (16), (17) and (23). We can then determine the optimal policy rule by substituting q^* in (23). It is clear that the optimal policy rule depends on the weight μ and the degree of capital mobility ρ.

In order to calculate $L(\mu,q)$ we need to determine the variances $V(y)$ and $V(\pi)$ and search for $q^* \in [0,1]$ which minimises $L(\mu,q)$. In the following

we describe the methodology we use to calculate V(y) and V(π). Using equations (16), (17) and (23) we obtain:

$$e = -(\lambda z + \alpha n)y_{-1} - n\pi_{-1} - \left(\frac{\beta}{\theta} + \delta\right)ze_{-1} + \gamma\kappa ne_{-2} - z\varepsilon - n\eta + \beta m\upsilon + \beta z\upsilon_{-1} \quad (24)$$

Denoting by X the vector (y, π, e)' we can rewrite (16), (17) and (24) as a vectorial equation:

$$X = \Phi_1 X_{-1} + \Phi_2 X_{-2} + E - \Theta_1 E_{-1} \quad (25)$$

where the matrices Φ_1, Φ_2, and Θ_1 are given as follows:

$$\Phi_1 = \begin{bmatrix} \lambda & 0 & \left(\frac{\beta}{\theta} + \delta\right) \\ \alpha & 1 & \gamma\kappa \\ -(\lambda x + an) & -n & -\left(\frac{\beta}{\theta} + \delta\right)z \end{bmatrix}$$

$$\Phi_2 = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & -\gamma\kappa \\ 0 & 0 & \gamma\kappa n \end{bmatrix} \quad (26)$$

$$\Theta_1 = \begin{bmatrix} \frac{z}{m} & \frac{n}{m} & \frac{1}{m} \\ 0 & 0 & 0 \\ -\frac{z^2}{m} & -\frac{zn}{m} & -\frac{z}{m} \end{bmatrix}$$

and the 'shocks' vector E is equal to (ε, η, - $z\varepsilon$ - $n\eta$ + $\beta m\upsilon$)'. Hence, the vector X follows an ARMA(2,1) process. For given parameter values (μ,q, k, ρ) and the other parameters of the model we determine the variance vector (V(y), V(π), V(e))' using the algorithm proposed by Mauricio (1995). The simulation we conduct[16] consists in analysing the effect of higher capital mobility on the disinflation speed q^* as well its effect on the coefficients (a,b) of the equivalent optimal policy rule (equation (21)) ($ay + b\pi^*$). Table 4.2 presents the results of the simulation, which consists in varying the degree of capital mobility ρ in the set {0.47, 0.8, 1.8, 3.8} and resolving the central bank's problem for different values of the relative weight μ.

Table 4.2 Effect of capital mobility on the disinflation speed, the policy rule coefficients and the variances of output and inflation

	q^*			
	$\rho = 0.47$	$\rho = 0.8$	$\rho = 1.8$	$\rho = 3.8$
$\mu \leq 1$	0.91	0.84	0.81	0.8
$\mu > 1$	0.28	0.55	0.7	0.76
	(a, b)			
	$\rho = 0.47$	$\rho = 0.8$	$\rho = 1.8$	$\rho = 3.8$
$\mu \leq 1$	(0.83, 0.21)	(0.92, 0.38)	(0.97, 0.47)	(0.99, 0.50)
$\mu > 1$	(1.43, 1.69)	(1.20, 1.08)	(1.08, 0.74)	(1.02, 0.59)
	V (Y)			
	$\rho = 0.47$	$\rho = 0.8$	$\rho = 1.8$	$\rho = 3.8$
$\mu \leq 1$	0.003	0.005	0.009	0.018
$\mu > 1$	1.635	0.971	0.445	0.188
	V (π)			
	$\rho = 0.47$	$\rho = 0.8$	$\rho = 1.8$	$\rho = 3.8$
$\mu \leq 1$	1.741	1.327	1.003	0.855
$\mu > 1$	0.446	0.625	0.696	0.736

First, we could note that for a given degree of capital mobility ρ in the set {0.47, 0.8, 1.8, 3.8} the disinflation speed is always lower (q^* higher) when the central bank accords more importance to reducing the variability of output relative to the variability of inflation ($1/\mu \geq 1$). For example, when $\rho = 0.47$ the value of q^* equals 0.91 and 0.28 respectively when $\mu \leq 1$ and $\mu > 1$. This result confirms what we obtained in Section 4.5, where we showed that the response of output to an inflation shock is less volatile when the adjustment speed is lower ($q = 0.76$) relatively to the case $q = 0$. The interpretation of this result is the following. Under the adjusted IT regime ($E\pi^*_{+2} = q\ E\pi^*_{+1}$) the transmission of monetary policy occurs through the indirect channel ([r,e] $\rightarrow$ y $\rightarrow$ π). Hence, the slower the disinflation speed the lower the output fluctuation needed to reduce inflation. Therefore, if the central bank accords relatively more importance to output variability it should reduce its disinflation speed (increase q^* or equivalently increase its targeting horizon).

Second, the results show that the effect of higher capital mobility on the disinflation speed depends on the relative weight of inflation versus output in the central bank loss function. Indeed, when output is relatively more important than inflation, the disinflation speed increases with capital mobility. The interpretation of this result rests on two points. The first point is that by hypothesis (see Section 4.5, calibra-

tion) the effect of a one-point variation in the interest rate on output is $\beta + \delta\theta$, which equals 1. Therefore, this causal effect is independent of the degree of capital mobility. The second point is that the effect of a one-point variation in the interest rate on inflation is 0.15q (see equations (6) and (7)). In addition, recall that the parameter θ is increasing in the degree of capital mobility. Hence, when capital mobility increases, a lower variation of the interest rate r is needed to reduce inflation. This in turns reduces the variability of output, relaxing the constraint on the adjustment speed and enabling it to be higher.

In the opposite case, corresponding to a relatively higher importance of inflation versus output ($\mu>1$), the disinflation speed diminishes (q^* increases) with capital mobility. The previous interpretation holds. When capital mobility increases, the same variation in the interest rate leads to a greater reduction in inflation. Therefore, the constraint (from the inflation side) on the disinflation speed is relaxed, allowing it to be reduced in order to achieve a gain in terms of output variation.

Table 4.2 presents the effect of capital mobility on the adjusted-policy rule's coefficients (a,b). For a given degree of capital mobility ρ in the set {0.47, 0.8, 1.8, 3.8} the coefficient of output (respectively inflation) is higher than the coefficient of inflation (respectively output) when the central bank accords more importance to the output (inflation) variability relative to inflation (output) variability. Interestingly the two coefficients vary in the same direction in response to the increase in capital mobility. They increase when $\mu > 1$ and decrease in the opposite case.

Finally, as expected, the results show that, for a given degree of capital mobility ρ in {0.47, 0.8, 1.8, 3.8}, the variability of output (respectively inflation) is higher when the Central Bank accords greater importance to inflation (respectively output). In addition, higher capital mobility leads to a relatively small increase in the variability of the privileged objective (output or inflation) of the central bank. On the contrary, it leads to a sharp decrease in the variability of the other objective. For example, if the central bank accords relatively more importance to the variability of output, then increasing the degree of capital mobility from 0.47 to 3.8 will increase the variability of output by 0.015 and reduce the variability of inflation by 0.886.

4.7 Conclusion

Like many emerging economies, Tunisia has opted for gradual capital account liberalisation. Its strategy involves many steps, among which are the adoption of a flexible exchange rate regime and the move to an

IT monetary policy. After analysing the Tunisian approach in terms of capital account liberalisation and its accompanying policies, this chapter looked into what type of IT regime is pertinent for a country like Tunisia.

To this end we proposed a modified version of Ball (1999) to allow for different degrees of capital mobility. In this framework monetary policy affects inflation through two channels. The first channel takes one period and passes through the direct effect of real exchange rate appreciation on inflation. The second channel takes two periods and passes through the output effect on inflation (the Phillips relation).

The chapter showed that, under 'pure' IT, an increase in the degree of capital mobility has two opposite effects. On the one hand, it reduces the variability of output and the exchange rate when the economy is exposed to an inflationary shock from the supply side. On the other hand, the variability of the exchange rate and output increases during the periods following an inflationary shock caused by a shift in investors' confidence in the economy.

The chapter argued that an 'adjusted' IT regime is more suitable for a developing country like Tunisia. In such a regime the central bank targets inflation excluding the direct but temporary effect of the exchange rate. In order to attain this 'adjusted' target the central bank relies only on the indirect channel, which reduces the volatility of the exchange rate to the maximum degree. Under this regime, lower capital mobility could be preferable, whatever the type of the inflationary shock (supply shock or investors' confidence shock), because it generates lower exchange rate volatility during the first period.

The chapter showed that, under the 'adjusted' IT regime and for a given degree of capital mobility, the disinflation speed is lower when the central bank accords more importance to reducing the variability of output relative to the variability of inflation. Finally, the chapter argued that the effect of higher capital mobility on the optimal disinflation speed (or equivalently the optimal targeting horizon) depends on the relative weight of inflation and output in the central bank loss function: when output is more important than inflation, it is shown that the disinflation speed increases with capital mobility and vice versa.

Notes

1. See Agénor and Montiel (2008). The very process of liberalisation may, of course, lead to a change over time in these factors, especially the role of liquidity constraints.
2. Dell'Ariccia et al. (2007) document a number of country cases in which the implementation of prudent macroeconomic policies was an important

factor in improving the growth benefits of financial integration, while minimising potential risks.

3. This is of potential relevance to Tunisia, because in the past few years a large fraction of the increase in FDI has originated from Arab countries and has been concentrated in the construction and tourism sectors – which are both labour and land intensive. While there is no evidence so far that these increases in FDI have led to excessive wage pressure, anecdotal evidence suggests that real estate prices have gone up substantially. However, causality has yet to be established and the longer-run effects of these changes on the relative price of land remain unclear.
4. Like, for instance Korea, Mexico and Brazil, which adopted inflation targeting respectively in January 1998, January 1999 and June 1999.
5. Among the reasons for the slow pace of liberalisation may have been the slow progress in strengthening the banking system and the relatively underdeveloped domestic financial markets (see Independent Evaluation Office, 2005: 71–4; Tahari et al., 2007).
6. According to the Central Bank of Tunisia's note IA n°2007-01 of 9 January 2007, foreign borrowing with a maturity superior to twelve months is totally liberalised for financial institutions and limited to 10 million dinars per year for non-financial institutions. Financial institutions should, however, be listed or evaluated by a rating agency.
7. When capital mobility is higher, this role requires the central bank to hold large amounts of precautionary international reserves. Meanwhile, in order to maintain some degree of monetary policy autonomy, sterilisation has become an important tool to limit the inflationary impact of massive international reserve accumulation (Aizenman and Glick, 2008).
8. At the present time, the euro is estimated to account for at least two-thirds of the dinar's currency basket.
9. See Fanizza et al. (2002) for an assessment of Tunisia's experience. Dropsy and Grand (2004) provide a formal analysis of the dynamics of inflation in Tunisia.
10. See, for instance, Mishkin and Schmidt-Hebbel (2007) and Lin and Ye (2007). Using a group of thirty-six developing and Eastern European countries covering the period 1980–2005 and comprising thirteen countries that implemented an IT regime, Gonçalves and Salles (2008) found that countries that adopted an IT regime saw more significant reductions in average inflation and growth volatility than non-IT targeters.
11. Mohanty and Klau (2004) noted that this is the central bank's objective in countries like Chile and Hungary.
12. The real exchange rate E equals SP*/P. Applying the log operator we obtain $e = s + p^* - p$.
13. This could be interpreted in terms of the country risk premium.
14. Contrary to Ball (1999), capital mobility is not necessarily perfect.
15. Uncovered interest parity holds when $i = i^* + (s^e_{+1} - s)$. According to Frankel (1989: 170) this means that 'asset demands are highly sensitive to expected rates of return', indicating not only that there are few transaction costs and government-imposed controls to separate national markets, but also that domestic-currency and foreign-currency bonds are perfect substitutes in investors' portfolios.
16. The algorithm was programmed in Mathematica by the authors.

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5

Monetary Policy Transmission and Targeting Mechanisms in Six MENA Countries

Simon Neaime

5.1 Introduction

Since the early 1990s some industrialised economies have implemented a monetary policy regime known as inflation targeting (IT). This shift was justified by the difficulties posed by targeting the nominal exchange rate, or in some instances money supply. At the same time, the move paved the way to an enhanced record in controlling inflation, and to monetary policies that were more independent, transparent and effective. Given the very encouraging experience of developed countries, a number of Middle Eastern and North African (MENA) countries have decided recently to adopt price stability and IT as either an explicit or an implicit monetary policy objective. One MENA country that has explicitly adopted IT as its main monetary policy goal is Turkey.

MENA economies have been able to contain the inflationary pressures of the last two decades by targeting the nominal exchange rate. By pegging their currencies to a low-inflation currency such as the euro or the US dollar, and relying on high interest rate policies to defend their exchange rates,[1] they have succeeded in containing inflation. However, although this policy has helped them to reduce inflation substantially, it has also generated persistent real exchange rate appreciations, losses in international competitiveness, large trade and budget deficits, the accumulation of sizable debts, and in some instances currency crises. Examples of countries that experienced these difficulties in the 1990s are Egypt, Jordan, Turkey and Lebanon.[2]

Moreover, the unhappy experience of MENA countries and developing countries in Latin America and East Asia with pegged exchange rate regimes has led emerging country policy makers to search for alternative nominal anchors. Inflation targeting, a monetary policy strategy that

has been successfully used by a number of developed countries, has thus become an increasingly attractive alternative that has been adopted by a growing number of emerging market countries, including Chile, Brazil, the Czech Republic, Poland and more recently Turkey.

After a series of currency crises, the central bank of Turkey has been working for the past few years with an inflation-targeting regime. Recently, the central bank became to some extent independent from the government, with an explicit price stability objective and a floating exchange rate. While interest and exchange rates continue to be heavily influenced by fiscal policies due to the large public sector borrowing requirements, the central bank has been successful in building up credibility over time and is increasingly shaping inflation and interest rate expectations. Lebanon's experience is similar to Turkey's in the late 1990s. Lebanon is a highly indebted and dollarised economy, characterised by a history of high inflation. Since 1993, the monetary authority has aimed at achieving currency stability on the one hand, and at helping the government finance its deficit without resorting to seigniorage revenues on the other. The monetary authority has succeeded to some extent in building up credibility over time and has been successful in stabilising the local currency since the exchange rate crisis of 1991.

Other MENA countries, including Morocco and Tunisia, are slowly moving towards an IT regime. They are already targeting the real exchange rate rather than the nominal rate in order to maintain competitiveness and avoid currency overvaluation, while opening their capital markets to international capital flows. In 2002, Egypt allowed more flexibility in its exchange rate. By mid-October 2003, the Egyptian pound (EP) had declined by 33% to reach EP 6.15 per US dollar (USD). One of the most important challenges facing Egypt today is shifting to a monetary policy framework that focuses on price stability with a flexible exchange rate regime. Monetary policy in Jordan is officially geared towards maintaining a fixed exchange rate peg to the USD. The Central Bank of Jordan does not yet enjoy the status of an independent and autonomous entity.

On the other hand, following the signing of the Barcelona declaration in 1995 between the European Union (EU) and twelve MENA countries, MENA countries are aiming for increased regional and interregional monetary and financial economic integration. A significant part of economic integration is the liberalisation of the capital account and the enhancement of cross-border capital flows. However, when capital becomes increasingly mobile across national borders, and nominal exchange rates are fixed, monetary policy becomes increasingly

subordinated to defending the nominal exchange rate peg.[3] In the extreme case, free capital movements and pegged exchange rates render the independence of monetary policy obsolete, as interest rates will have to shadow the interest rate of the anchor currency to which national currencies are pegged, irrespective of whether this foreign interest rate level suits the economic situation of the country. Under these circumstances, shifting to IT in some MENA countries may become even more difficult to implement.

Against this backdrop, using time series econometric techniques, mainly vector autoregression (VAR) and impulse response functions (IRFs), this study aims to assess how successful the six MENA countries considered have been in making a transition towards IT, given their respective monetary policy transmission mechanisms, exchange rate regimes, and the current targets, instruments and goals of their monetary policy. It then identifies the transmission channels of these instruments, as well as their impact on the MENA economies, and the time necessary for the policy instruments to manifest their impact. The recent success of Turkey in shifting to IT should pave the way for the remaining countries to follow suit.

The study is divided as follows. Section 5.2 presents a summary of related literature on IT and the transmission mechanism of monetary policy. Section 5.3 lays down the methodology for the empirical analysis. Section 5.4 presents the empirical results. The last section concludes the study with policy implications.

5.2 Literature review

Since the early 1990s, there has been a large and growing literature dealing with inflation as a target of monetary policy. While the literature on developed countries is significant, studies dealing with the MENA region are still limited. It is well known that IT regimes emphasise the need to make monetary policy transparent, and to render the central bank more independent. In fact, these features, which have been central to the strategy's success in developed countries, are still absent in many MENA countries. As illustrated in Mishkin and Posen (1997), and in Bernanke et al. (1999), inflation-targeting central banks have frequent communications with the government, preserving at the same time a great degree of independence.

The VAR approach to economic fluctuations, which was pioneered by Sims (1980), has been widely used in the empirical literature to analyse the transmission mechanism of monetary policy in developed

economies, and to assess the success of the conduct of monetary policy and the choice of instruments and targets. More recent studies have used the VAR model to assess the success of IT in developing countries (see, for instance, Disyatat and Vongsinsirikul, 2003; Gottschalk and Moore, 2001; Qin et al., 2005; Schmidt-Hebbel and Tapia, 2002).

Within the context of the new IT framework for monetary policy in Poland, Gottschalk and Moore (2001) study the links between monetary policy instruments and inflation targets. They employ VAR models to find such relations, in particular between the short-term interest rate as policy instrument, and inflation as target. Their paper finds that the exchange rate played a dominant role as a policy instrument in the 1990s. However, links between the short-term interest rate and inflation have been weak. Given this finding, widening the target range or lengthening the target horizon would be optimal.

Beetsma and Bovenberg (1996) explore how monetary policy set by the central bank interacts with public debt policy determined by the fiscal authorities. They find that the need to establish the credibility of discretionary monetary policies restrains debt accumulation if policymakers coordinate their policies. In the absence of coordination, the conflict between the central bank and the government about future monetary policy induces the government to use debt strategically. In the absence of political distortions (and in contrast to the case of coordination), a properly designed conservative independent central bank is sufficient to establish the second best. With an opportunistic or myopic government, however, monetary institutions need to be supplemented by an optimal debt target. Without such a debt target, a conservative central bank leads to excessive debt accumulation.

Erol and Van Wijnbergen (1997) study empirically the conflict among monetary policy targets under a real exchange rate policy, that is, between the trade balance and domestic inflation. This occurs when the nominal exchange rate is managed to achieve a certain level of the real exchange rate in order to maintain external competitiveness. The empirical analysis draws on the Turkish case, in which the exchange rate has been the key policy instrument since the 1980s. The results from the simulation experiments with a well defined macro model point to moderate inflationary consequences of a real exchange rate policy based on the relative purchasing power parity (PPP) rule in Turkey. Moreover, a real exchange rate appreciation is found to be contractionary. Another major conclusion is that the exchange rate policy can provide an anchor for price stability only if it is credible. More recent papers (see, for instance, Kara, 2006) describe in detail Turkey's

transition from implicit targeting to the recent explicit targeting of inflation. From a different perspective, Basci et al. (2007) examine the transmission mechanism of monetary policy for a better understanding of Turkey's monetary policy targeting mechanism.

Mishkin (2000) discusses the advantages and disadvantages of IT for emerging countries as a monetary policy strategy. He argues that although IT is not a solution, and may not even be appropriate, for many emerging market countries, it can be a useful monetary policy in a number of them. One characteristic shared by many emerging market countries is their insistence on limiting exchange rate movements, partly because of the existence of a sizable stock of external debt and/or a high degree of dollarisation. This creates the risk of transforming the exchange rate into a nominal anchor for monetary policy that takes precedence over the inflation target. Therefore, the author recommends inflation-targeting central banks in emerging market countries to adopt a transparent policy of smoothing short-term exchange rate fluctuations, while making it clear to the public that they will allow exchange rates to reach their equilibrium level in the long term.

Disyatat and Vongsinsirikul (2003) study the monetary transmission mechanism in Thailand. They examine the transmission from money market rates to retail rates, to quantify the lags associated with monetary policy shocks, and investigate the channels through which these shocks are propagated. To that end, the authors use a restricted VAR model, the Vector Error Correction Model (VECM). The empirical results point to a transmission mechanism in which investment is particularly sensitive to monetary shocks, and where banks act as an important conduit for monetary policy to real activity.

Qin et al. (2005) investigate empirically how monetary policy has been transmitted into the macroeconomy of China. Econometric VAR modelling reveals that the interest rate, the required reserve ratio, and a direct quantity control rule for the base money supply are the most effective tools of monetary policy in China. Model simulations show that these instruments are most effective in influencing monetary aggregates and prices, but are least effective in influencing the real economy in the long term.

Since Bernanke and Blinder (1992) and Sims (1992), a considerable literature has emerged that employs VAR methods in attempts to identify and measure the effects of monetary policy shocks on macroeconomic variables. In a recent paper, Bernanke and Boivin (2003) argue that the sparse information sets typically used in these empirical models lead to at least two potential problems with the results. First, to the extent that

central banks and the private sector have information not reflected in the VAR, the measurement of policy innovations is likely to be contaminated. A second problem is that impulse responses can be observed only for the variables included, which generally constitute only a small subset of the variables that the researcher and policymaker care about.

The literature on the MENA region has recently been growing fast. For instance, Al-Mashat and Billmeier (2008) found that the exchange-rate channel still plays the dominant role in the transmission channels of monetary policy in Egypt, and the flexibility of the exchange rate is a prerequisite for successful IT. In their empirical work, they found that GDP is affected more by exchange rate fluctuations than by the interest rate.

Boughrara et al. (2008) found that some of the prerequisites for IT in Morocco are not yet satisfied. Morocco still suffers from a fiscal deficit, which is translated into public debt. Sometimes the government tries to finance the debt through seigniorage revenues, hence putting upward pressure on inflation in the country. The central bank of Morocco still does not have enough information about the monetary transmission mechanisms and is expected to face difficulties in the implementation of the IT regime in the future.

Finally, Boughrara (2007) argued that it is not the appropriate time for Tunisia to adopt IT as a targeting strategy because some of the conditions for successful adoption are still not satisfied. Some of the problems that Tunisia faces are the following: 1) the banking system in Tunisia is still fragile; 2) the IT regime requirements may reduce overall competitiveness in Tunisia; 3) the central bank lacks knowledge about the transmission mechanisms in the Tunisian economy. For IT to work, the central bank should be independent from the government, and should be clear and transparent when conveying the new policy/strategy to the public.

With the above in mind, this paper adds to the existing literature on developing countries in general and the MENA region in particular by examining empirically: 1) the transmission mechanism of monetary policy within the region, drawing on the nature of monetary policy targets and instruments that should be adopted; 2) the prospects and requirements for transition to an IT regime.

5.3 Empirical methodology

Implementing an IT regime requires first and foremost an understanding of the monetary transmission mechanisms in individual MENA countries. It also requires a rigorous assessment of the links between

the instruments of monetary policy and the inflation target. However, understanding these links within MENA may be complicated by the high degree of structural adjustments that occurred during the stabilisation period of the early 1990s in Egypt, Jordan and Lebanon, and by major revisions to the monetary policy regime, with the exchange rate GDP, the money supply and the short-term interest rate alternating as the monetary policy target. To shed light on these issues, this section uses VAR and IRFs to understand MENA's monetary policy transmission and targeting mechanisms.

VAR models are widely used in the econometrics literature because they sidestep the need for structural modelling by modelling every endogenous variable in the system as a function of the lagged values of the remaining endogenous variables. Since only lagged values of the endogenous variables appear on the right hand side of each equation, there is no issue of simultaneity, and ordinary least squares (OLS) is the appropriate estimation technique. In addition, the assumption that the error terms are not serially correlated is not restrictive, because any serial correlation could be absorbed by adding more lagged dependent variables.

The VAR approach has been widely used in the recent empirical literature because of the following advantages. First, its being an explicit dynamic system renders it the most appropriate econometric model for studying the dynamics of monetary policy. Second, VAR treats all variables in the system as jointly endogenous, and does not distinguish between endogenous and exogenous variables. In particular, each individual variable in the monetary model depends on its lagged realisation and on all other variables, suggesting a genuine simultaneity among them. Third, VAR permits the modelling of both endogenous and exogenous shocks, which are indisputably the main sources of monetary dynamics in the small, open economies of the MENA region. Fourth, VAR models are relatively easy to estimate for a single MENA country. Each equation separately can be estimated by OLS, which is consistent and asymptotically efficient. Finally, VAR has a clear practical value as an efficient tool for a robust analysis of the monetary performance of MENA countries.

As stated earlier, the transmission mechanisms of monetary policy in the MENA region will be modelled using the VAR methodology. For each individual MENA country[4] (Egypt, Jordan, Lebanon, Morocco, Tunisia and Turkey) the econometric analysis starts with a monetary VAR model, which includes the nominal exchange rate (ER) and the three-month treasury bills (TB) rate as policy variables, and GDP and

the consumer price index (CPI) as the output and price variables respectively. The four-equation VAR model with one lag for the individual MENA country is given by

$$Y_{i,t} = \alpha + \alpha_1 Y_{i,t-1} + \alpha_2 CPI_{i,t-1} + \alpha_3 ER_{i,t-1} + \alpha_4 TB_{i,t-1} + \varepsilon_{1,t}, \quad (1)$$

$$CPI_{i,t} = \beta + \beta_1 CPI_{i,t-1} + \beta_2 Y_{i,t-1} + \beta_3 ER_{i,t-1} + \beta_4 TB_{i,t-1} + \varepsilon_{2,t}, \quad (2)$$

$$ER_{i,t} = \delta + \delta_1 ER_{i,t-1} + \delta_2 Y_{i,t-1} + \delta_3 CPI_{i,t-1} + \delta_4 TB_{i,t-1} + \varepsilon_{3,t}, \quad (3)$$

$$TB_{i,t} = \lambda + \lambda_1 TB_{i,t-1} + \lambda_2 Y_{i,t-1} + \lambda_3 CPI_{i,t-1} + \lambda_4 ER_{i,t-1} + \varepsilon_{4,t}, \quad (4)$$

where $Y_{i,t}$ is real GDP of country i in period t; $CPI_{i,t}$ is the consumer price index of country i in period t; $ER_{i,t}$ is the exchange rate of country i in period t; and $TB_{i,t}$ is the treasury bill rate of country i in period t. The ordering of the equations in the above VAR model is not ad hoc; it is meant to allow for meaningful interpretation of the impulse response functions to be used in the following analysis. The model uses economic theory and intuition, as well as the concept of the orthogonality of structural innovations. The interest and exchange rates are put last in the above VAR specification. It is assumed that GDP and inflation react only with a lag to shifts in monetary policy. Since the MENA economies are characterised by several nominal rigidities, this is a plausible restriction.

One shortcoming of the above methodology, however, is embodied in the Cholesky identification procedure which is, to some extent, MENA region-specific as opposed to being MENA country-specific. Since the six MENA countries included in the empirical analysis have different exchange rate regimes and are targeting different variables using different monetary policy instruments, it would be nearly impossible to have what would be the appropriate single country-specific identification for all MENA countries.[5] This shortcoming may bias the empirical results of the two MENA countries with the most rigid exchange rate regimes, namely Jordan and Lebanon.

The VAR model (1)–(4) may be written in matrix form as follows

$$Z_t = \Omega_0 + \Omega_1 Z_{t-1} + \ldots + \Omega_j Z_{t-q} + \eta_t, \quad (5)$$

where Z_t is a 4 by 1 vector of variables in the system at time *t;* the Ω_j for $j = 0,...,q$ are 4 by 4 matrices of coefficients; and η_t is a 4 by 1 vector of structural shocks with the variance-covariance matrix $E(\eta_t\eta_t') = \rho$.

The VAR estimates (5) in the reduced form

$$Z_t = \pi_1 Z_{t-1} + ... + \pi_q Z_{t-q} + \upsilon_t, \tag{6}$$

where v_t is the 4 by 1 vector of residuals with variance-covariance matrix $E(\upsilon_t\upsilon_t') = \omega$. Defining $\pi_0 = \dfrac{1}{\rho - \Omega_0}$ implies that $\upsilon_t \pi_i = \pi_0 \Omega_j$ for $j = 0,...,q$. The structural innovations and the reduced-form residuals are thus related by

$$\upsilon_t = \pi_0 \eta_t, \tag{7}$$

so that

$$\omega = \pi_0 \pi'_0. \tag{8}$$

To obtain the impulse response functions, we write equations (5) and (6) respectively as

$$Z_t = \frac{\eta_t}{\rho - \Omega(L)}, \tag{9}$$

and

$$Z_t = \frac{v_t}{\rho - \pi(L)}. \tag{10}$$

From equation (7), the impulse response to structural shocks can be obtained from (9) and (10) using the relation

$$\rho - \pi(L) = \rho - \Omega(L). \tag{11}$$

Impulse response functions trace the effect of a one standard deviation shock to one of the innovations on current and future values of the endogenous variable. In other words, a shock to the *j-th* variable directly affects the *j*-variable, and is also transmitted to all of the endogenous variables through the dynamic structure of the VAR. The impulse response functions shed light on the dynamics of the variables included in the VAR system as a result of shocks to either one of these variables. The impulse response functions permit us to explore how the target

(GDP and inflation) variables might respond to various shocks in the monetary policy instruments (exchange and interest rates).

The estimation is carried out using quarterly, seasonally adjusted data gathered from the International Monetary Fund's *International Financial Statistics*, from 1990Q1 to 2006Q4. All variables, except the interest rate, enter in natural logarithms. In addition, an intervention dummy variable is introduced to remove the effect of the exchange rate turbulence of the early 1990s in Egypt, Jordan, Lebanon and Turkey. The optimal lag length under various criteria is determined using the Akaike, Schwartz and Hannan-Quinn criteria.[6]

5.4 Empirical results

Figures 5.1–5.6 depict the dynamic responses of the macro econometric model to two monetary shocks: shocks to the interest rate and shocks to the exchange rate, with the respective 90% confidence interval. The interest rate shock corresponds to a 1% increase in interest rates, while the exchange rate shock corresponds to an appreciation of 1%.

Table 5.1 indicates that with the exception of the TB rate, all four time series for Egypt contain unit roots and are integrated of order 1, I(1). Egypt's VAR model is therefore estimated with the variables in first difference form given the evidence of no cointegration between the four series (Table 5.2).

IRFs are next deduced from Egypt's VAR model in first differences. Figure 5.1(a) indicates that after an exchange rate shock, prices decrease during the first three quarters. In fact, prices respond quite swiftly to

Table 5.1 Unit root statistics – Egypt

Variable	Lag	ADF t-statistic	KPSS(η)	Result
GDP	4	−1.38	0.22**(τ)	I(1)
CPI	1	−2.58	0.23**(τ)	I(1)
ER	1	−2.06	0.16* (τ)	I(1)
TB	8	−4.34**	0.12 (τ)	I(0)

Notes: All variables are in logs unless otherwise indicated. The asterisks indicate a rejection of the null hypothesis at the 5% (*) or the 1% (**) level. ADF denotes Augmented Dickey–Fuller test with the null hypothesis of non-stationarity. The lag length has been chosen on the basis of the Akaike Information and Hannan-Quinn criteria. Due to the apparent time trend in all series, the ADF tests have been specified to include a trend variable. The KPSS statistic implements the unit root test proposed by Kwiatkowski et al. (1992) with trend stationarity (τ) as the null hypothesis.

Source: Author's estimates.

Table 5.2 Cointegration tests – Egypt

Hypothesis		λ- Trace statistics	Critical values	Prob.	λ- Max-Eigen statistics	Critical values	Prob.
Null	Alternative		5%			5%	
r = 0	r ≥ 1	47.04	47.85	0.05	23.47	27.58	0.15
r ≤ 1	r ≥ 2	23.57	29.79	0.21	13.82	21.13	0.37
r ≤ 2	r ≥ 3	9.74	15.49	0.30	8.60	14.26	0.32
r ≤ 3	r = 4	1.13	3.84	0.28	1.13	3.84	0.28

Notes: The Johansen Cointegration Likelihood Ratio Test is based on the Trace and the λ-Max-Eigenvalue of the Stochastic Matrix. r represents the number of cointegrating vectors. The asymptotic critical values are from Osterwald-Lenum (1992), and the probabilities (p-values) are from MacKinnon et al. (1999). Test assumes restricted linear deterministic trend in the data, and a constant.

Source: Author's estimates.

an appreciation of the exchange rate. This is expected since in the small, open economy of Egypt prices of traded goods return rapidly to world levels following an exchange rate appreciation. The interest rate falls in response to the appreciation of the exchange rate (Figure 5.1(c)), suggesting that the central bank attempts to ease the pressure of higher interest rates on GDP, and to offset further exchange rate appreciation. That is, by lowering the interest rate, the monetary authority hopes to reverse any inflow of capital and decrease the pressure on Egypt's pound. In addition, GDP declines as a result of an exchange rate appreciation, and that effect is persistent for about five quarters (Figure 5.1(b)). This points to the sensitivity of Egypt's economic activity to innovations in its trade balance. The empirical results suggest that Egypt's exchange rate is quite effective with respect to GDP and inflation. This is not surprising given the recent float of Egypt's pound (and the subsequent positive effects on exports) and the rate of growth of GDP.

GDP decreases for four consecutive quarters as a result of a 1% increase in interest rates (Figure 5.1(e)). The decrease in GDP dies out after the fourth quarter. Investment in Egypt is crowded out by increases in interest rates, with a subsequent decline in GDP. This points to the fact that investment is particularly sensitive to monetary shocks. Similar dynamics are observed for prices, which also decrease permanently, and the effect becomes more significant after quarter 6 (Figure 5.1(d)). While this effect is not clearly significant during the first six quarters, it is nevertheless robust thereafter. Comparing the price response observed

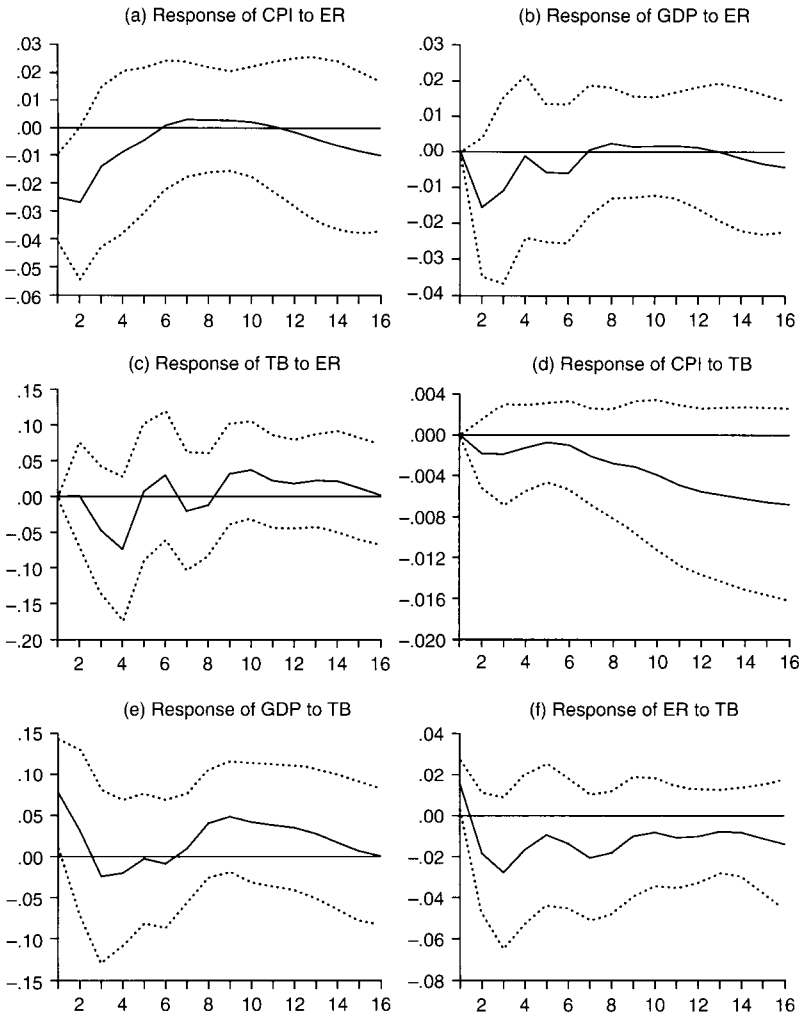

Figure 5.1 Impulse response functions – Egypt

Notes: CPI is the consumer price index. ER is the nominal exchange rate. TB is the three month treasury bill rate. GDP is gross domestic product.
Source: Author's estimates.

under an interest rate shock with the response to an exchange rate shock, in the short term, prices respond more gradually to an exchange-rate shock, but in the long term the effect is more significant under an interest rate shock. Moreover, an increase in interest rates triggers an

exchange rate appreciation of the EP (Figure 5.1(f)). This effect appears to be quite persistent. Given the significant negative effects of an appreciation on the price level above, this suggests that the transmission of the interest rate shock on prices has occurred, at least to some extent, via the exchange rate channel. The importance of the exchange rate in the transmission of interest rate effects is also obvious in the response of the GDP variable.

While the importance of the exchange rate channel is not surprising, given that Egypt is a small, open economy, it nevertheless raises an important issue in the context of IT. If this channel plays an important role, a substantial part of the adjustment burden will fall on the traded goods sector, even if Egypt's central bank considers the interest rate to be its main monetary policy instrument. Substantial interest rate responses, with potentially adverse effects on Egypt's competitiveness, might be required. This may undermine the inflation target, and may induce the central bank to target once again the nominal exchange rate.

Egypt has recently introduced some flexibility in its exchange rate regime, and is considering shifting to a monetary policy framework that focuses on price stability. So far there are encouraging observations to make despite the 2008 surge in inflation. First, inflation has been better contained than in the 1990s. Second, recessions have become less frequent and milder, and economic expansions have been sustained and enhanced. The future success of the IT policy will depend on the ability of the central bank to contain the recent resurgence of inflation and to isolate the real side of Egypt's economy from nominal domestic and foreign shocks.

Table 5.3 indicates that all four time series for Jordan contain unit roots and are integrated of order 1, I(1). Given the evidence of no cointegration between the four series (Table 5.4), Jordan's VAR model is estimated with the variables in first difference form.

Table 5.3 Unit root statistics – Jordan

Variable	Lag	ADF t-statistic	KPSS(η)	Result
GDP	4	−2.77	0.27**(τ)	I(1)
CPI	1	−2.85	0.24**(τ)	I(1)
ER	6	−1.00	0.28**(τ)	I(1)
TB	2	−2.63	0.52*(τ)	I(1)

Notes: Refer to Table 5.1. The ADF and KPSS tests have been specified to include a constant and no trend for the TB variable due to the absence of a trend.

Source: Author's estimates.

Table 5.4 Cointegration tests – Jordan

Hypothesis		λ- Trace statistics	Critical values	Prob.	λ- Max-Eigen statistics	Critical values	Prob.
Null	Alternative		5%			5%	
r = 0	r ≥ 1	38.30	43.21	0.12	20.33	23.15	0.20
r ≤ 1	r ≥ 2	20.06	22.17	0.35	12.36	16.89	0.65
r ≤ 2	r ≥ 3	9.32	13.11	0.41	5.05	12.33	1.56
r ≤ 3	r = 4	3.01	4.33	0.18	1.09	4.03	0.18

Notes: Refer to Table 5.2.

Source: Author's estimates.

IRFs are next deduced from Jordan's VAR model in first differences. Figure 5.2(a) indicates that Jordan's prices are insignificantly affected by an exchange rate shock. This is expected, since Jordan has pursued a rigid monetary policy of nominal exchange rate targeting. The interest rate response is also insignificant in response to the appreciation of the exchange rate (Figure 5.2(c)), suggesting that the central bank will not attempt to offset some of the tightening in the monetary conditions. This is also expected, since by adopting a fixed exchange rate to the USD Jordan has rendered its monetary policy ineffective. The dynamic response of GDP is quite similar to the responses of prices and the interest rate (Figure 5.2(b)). The empirical results suggest that Jordan's exchange rate is not effective with respect to GDP, interest and inflation rates. This is not surprising given the fact that since the early 1990s Jordan has been pursuing a monetary policy with fixed nominal exchange rates as its unique target.

GDP decreases for two consecutive quarters as a result of a 1% increase in interest rates (Figure 5.2(e)). However, the responses of prices and exchange rates are insignificant (Figure 5.2(d) and (f)). Analysis of the price response observed under an interest rate shock and the response to an exchange rate shock shows that prices appear not to respond to either policy variable. While the lack of importance of the exchange-rate and interest rate channels is not surprising, given that Jordan has followed a rigid peg to the USD, this nevertheless raises an important issue in the context of IT. As Jordan proceeds with the liberalisation of its trade and capital accounts, the pursuit of a fixed exchange rate regime will render monetary policy even more ineffective. In other words, free goods and capital movements and pegged exchange rates will render the independence of monetary policy obsolete, as interest rates will have to shadow the interest rate on the USD irrespective of

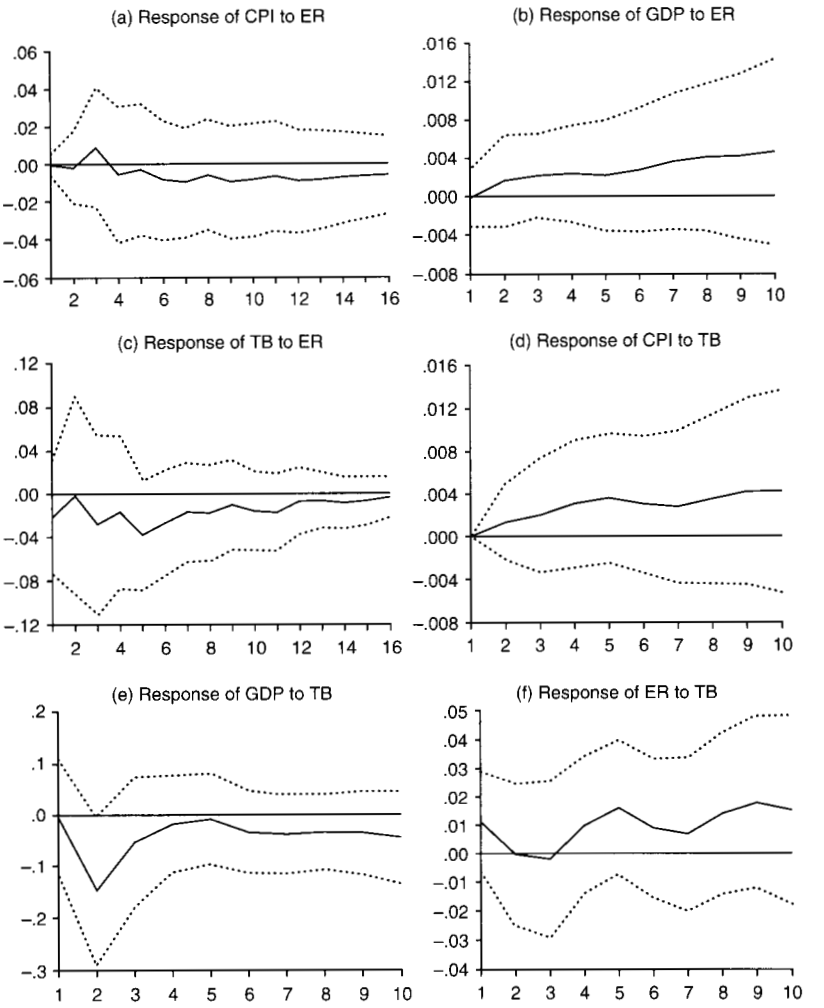

Figure 5.2 Impulse response functions – Jordan

Note: Refer to Figure 5.1.
Source: Author's estimates.

whether this interest rate level suits the economic situation in Jordan. This would render the shift to targeting the rate of inflation even harder to achieve.

Jordan's central bank does not yet enjoy the status of an independent and autonomous central bank. Since the end of the 1990s, the bank

has gradually lowered interest rates (from 9% in 1998 to 2% at the end of 2006) in response to the decline in US interest rates, in an effort to bolster economic growth and investment. To shift to IT, Jordan will have to allow its central bank greater independence and introduce some flexibility in the exchange rate.[7] However, the Jordanian dinar has been effectively pegged to the USD since the early 1990s. This strategy has played a key role in attracting foreign capital. The exchange rate peg has been supported by relatively high international reserves.

Table 5.5 indicates that all four time series for Lebanon contain unit roots and are integrated of order 1, I(1). Lebanon's VAR model is therefore estimated with the variables in first difference form, given the evidence of no cointegration between the four series (Table 5.6).

IRFs are next obtained from Lebanon's VAR model in first differences. Figure 5.3(a) indicates that Lebanon's prices are significantly affected by an exchange rate shock. They first increase a little but subsequently decrease for six consecutive quarters. Since the early 1990s the central bank's main monetary policy objective has been overall price stability – including the price of foreign exchange – after the huge inflationary

Table 5.5 Unit root statistics – Lebanon

Variable	Lag	ADF t-statistic	KPSS(η)	Result
GDP	8	–2.26	0.24**(τ)	I(1)
CPI	8	–2.52	0.25**(τ)	I(1)
ER	10	–11.67**	0.17*(τ)	I(1)
TB	2	–3.25	0.18*(τ)	I(1)

Note: Refer to Table 5.1.

Source: Author's estimates.

Table 5.6 Cointegration tests – Lebanon

Hypothesis		λ- Trace statistics	Critical values	Prob.	λ-Max-Eigen statistics	Critical values	Prob.
Null	Alternative		5%			5%	
r = 0	r ≥ 1	36.40	40.17	0.11	19.31	24.15	0.19
r ≤ 1	r ≥ 2	17.08	24.27	0.30	10.41	17.79	0.44
r ≤ 2	r ≥ 3	6.67	12.32	0.35	4.52	11.22	0.54
r ≤ 3	r = 4	2.14	4.12	0.16	2.14	4.12	0.16

Notes: Refer to Table 5.2.

Source: Author's estimates.

pressures of the late 1980s and the 1989 exchange rate crisis. The bank has since succeeded to a great extent in bringing down both the inflation rate, to single digit figures, and the exchange rate, from a peak of Lebanese pound (LP) 2,800 per USD to a central parity of LP 1,500 per USD. The central bank, through its continuous intervention in the foreign exchange market, gained confidence in its commitment to price and exchange rate stability, which has enabled it to create a gradual immunity of the LP against political and economic pressures. In addition, as it is a small, open economy in which imported goods constitute about 90% of domestic consumption, price changes in Lebanon are closely related to exchange rate changes. By achieving exchange rate stability and controlling the growth rate of the money supply, the central bank was able to decrease the inflation rate from 120%, in 1992, to about 2%, in 2006, with subsequent surges in 2007 and in 2008. However, the interest rate response is insignificant in response to the appreciation of the exchange rate (Figure 5.3(c)), suggesting that the central bank will not attempt to offset some of the tightening in the monetary conditions. The dynamic response of GDP is quite similar to the response of interest rates (Figure 5.3(b)). The empirical results suggest that the exchange rate is not effective with respect to GDP and interest rates.

Figure 5.3(f) indicates that the exchange rate appreciates significantly as a result of an increase in interest rates. This is expected, since the central bank has been using the TB rate to stabilise the domestic currency. However, GDP is insignificantly affected by a 1% increase in interest rates. The price response is also insignificant (Figure 5.3(d)). In the pursuit of a monetary policy with a fixed exchange rate as a target, the monetary authority did not care about GDP growth developments. The result was a significant decline in GDP growth rates after the late 1990s, and Lebanon entered into a period of consecutive recessions. Comparing the price response observed under an interest rate shock with the response to an exchange rate shock, prices appear to respond significantly to the exchange rate policy variable. Refinancing the growing budget deficit has been a challenging task for the central bank. The bank coordinated with the ministry of finance in order to help the government to meet its obligations without recourse to seigniorage revenues, which have inflationary effects. Sizable fiscal imbalances have been largely financed through the issuance of TBs in an auction framework. Through a high interest rate policy, the central bank managed to ensure sufficient TB subscription to secure adequate funding for the treasury. Accordingly, flexible and high interest rates on TBs were necessary to ensure the necessary inflow of capital. This, of course,

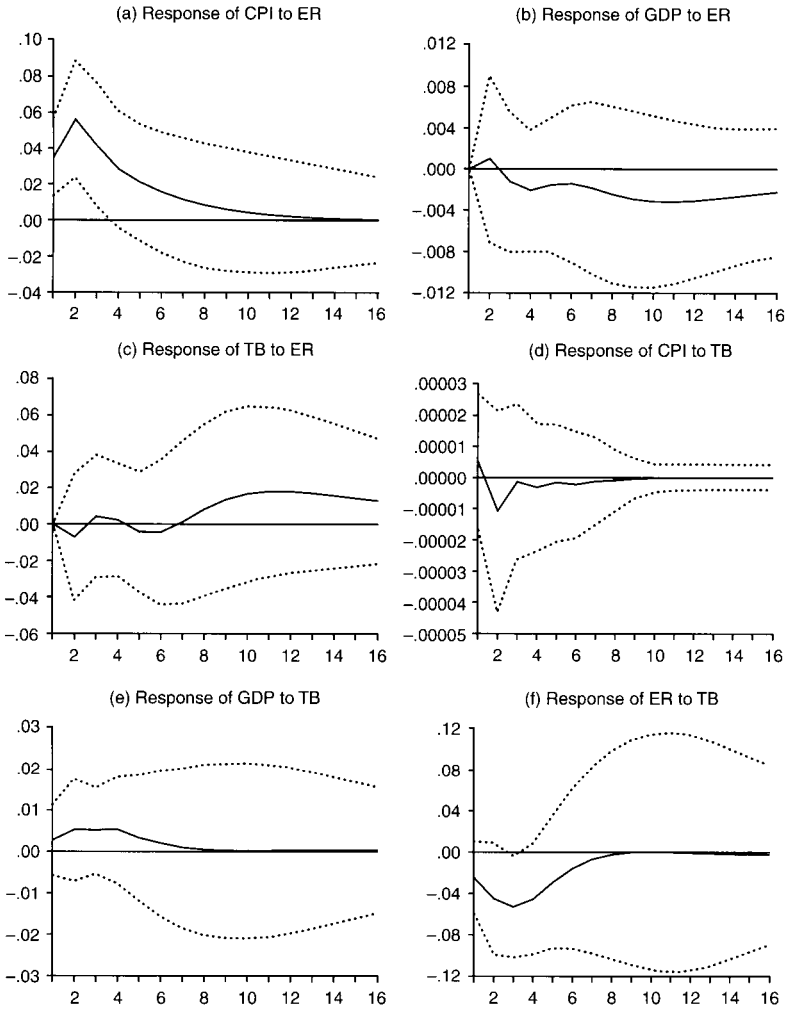

Figure 5.3 Impulse response functions – Lebanon

Note: Refer to Figure 5.1.

Source: Author's estimates.

led to exchange rate appreciations, which the central bank sterilised by accumulating foreign currency reserves, keeping the exchange rate fixed around a central parity of LP 1,500 per USD.

Hence, the central bank has succeeded so far in managing the budget deficit while maintaining exchange rate stability. Through the use

of the TB rate, and the management of foreign exchange reserves, the central bank has been able to achieve its intended objective, exchange rate stability. Moreover, the central bank's recent insistence on a rigid exchange rate peg is mainly because of the existence of a sizable stock of external debt and a high degree of dollarisation in the economy. This has transformed the exchange rate into a nominal anchor for monetary policy, which has taken precedence even over IT considerations. Therefore, to be able to shift to a monetary policy that targets inflation, the central bank needs to: 1) quit targeting the nominal exchange rate, although this can be achieved smoothly and with the least cost only after the fiscal stance is put back on a sustainable path; 2) adopt in the medium term a transparent policy of smoothing short-run exchange rate fluctuations, while making it clear to the public that it will allow exchange rates to reach their equilibrium level in the long term. However, given the accumulation of a sizable debt, targeting the nominal exchange rate may prove to be currently optimal to avert an imminent currency and debt crisis and keep debt service under control. In all cases, if Lebanon still opts for maintaining its exchange rate fixed against the USD, it will have to implement crisis prevention measures, that is, the exercise of fiscal discipline, the proper management of its debts and foreign reserves, and the avoidance of future real exchange rate appreciations.

Table 5.7 indicates that all four of Morocco's time series contain a unit root and are integrated of order 1, I(1). However, given the evidence of cointegration between the four variables, a VECM model is estimated (Table 5.8).

IRFs are next obtained from Morocco's VECM. Figure 5.4(a) indicates that an exchange rate shock in Morocco decreases prices during the first two quarters, but these revert thereafter and increase for three consecutive quarters. In fact, prices respond quite quickly to an appreciation of the exchange rate. This is expected, since in the small, open econ-

Table 5.7 Unit root statistics – Morocco

Variable	Lag	ADF t-statistic	KPSS(η)	Result
GDP	1	–1.59	0.15*(τ)	I(1)
CPI	3	–2.06	0.25**(τ)	I(1)
ER	2	–1.50	0.18*(τ)	I(1)
TB	1	–1.93	0.20*(τ)	I(1)

Note: Refer to Table 5.1.

Source: Author's estimates.

Table 5.8 Cointegration tests – Morocco

Hypothesis		λ- Trace statistics	Critical values	Prob.	λ- Max-Eigen statistics	Critical values	Prob.
Null	Alternative		5%			5%	
r = 0	r ≥ 1	58.68*	47.85	0.00	29.22*	27.58	0.03
r ≤ 1	r ≥ 2	29.45	29.79	0.05	20.64	21.13	0.05
r ≤ 2	r ≥ 3	8.80	15.49	0.38	8.16	14.26	0.36
r ≤ 3	r = 4	0.64	3.84	0.42	0.64	3.84	0.42

Notes: Refer to Table 5.2. * indicates significance at the 5% level of significance.

Source: Author's estimates.

omy of Morocco, prices of traded goods return rapidly to world levels following an exchange rate shock. Moreover, there is a persistent and significant interest rate fall in response to the exchange rate's appreciation (Figure 5.4(c)), suggesting that the central bank attempts to offset some of the tightening in monetary conditions to preclude further appreciation of the exchange rate. It is well known that Morocco has extensive trade relations with the European Union (EU). Therefore, the central bank has been intervening regularly to offset any appreciation of the exchange rate. Such appreciation would harm exports and turn the current account surplus into a deficit, with negative consequences for the rate of growth of GDP. In addition, GDP also declines as a result of an exchange rate appreciation, and that effect is persistent for about four quarters (Figure 5.4(b)), highlighting its sensitivity to innovations in the trade balance. The empirical results suggest that the exchange rate is quite effective with respect to GDP, inflation and interest rates in Morocco. The central bank has successfully been targeting the real exchange rate in order to maintain competitiveness, avoid currency overvaluation, and stimulate the rate of growth of real GDP.

According to Figure 5.4(e), there is a persistent and significant decline in GDP as a result of a 1% increase in interest rates. The decrease in GDP does not peter out even after four years. This points to the fact that investment is particularly sensitive to monetary shocks in Morocco. Similar dynamics are observed for prices, which also decrease permanently (Figure 5.4(d)). Comparing the price response observed under an interest rate shock with the response to an exchange rate shock, prices respond more gradually to an interest rate shock. Moreover, an interest rate shock triggers the appreciation of the dinar (Figure 5.4(f)),

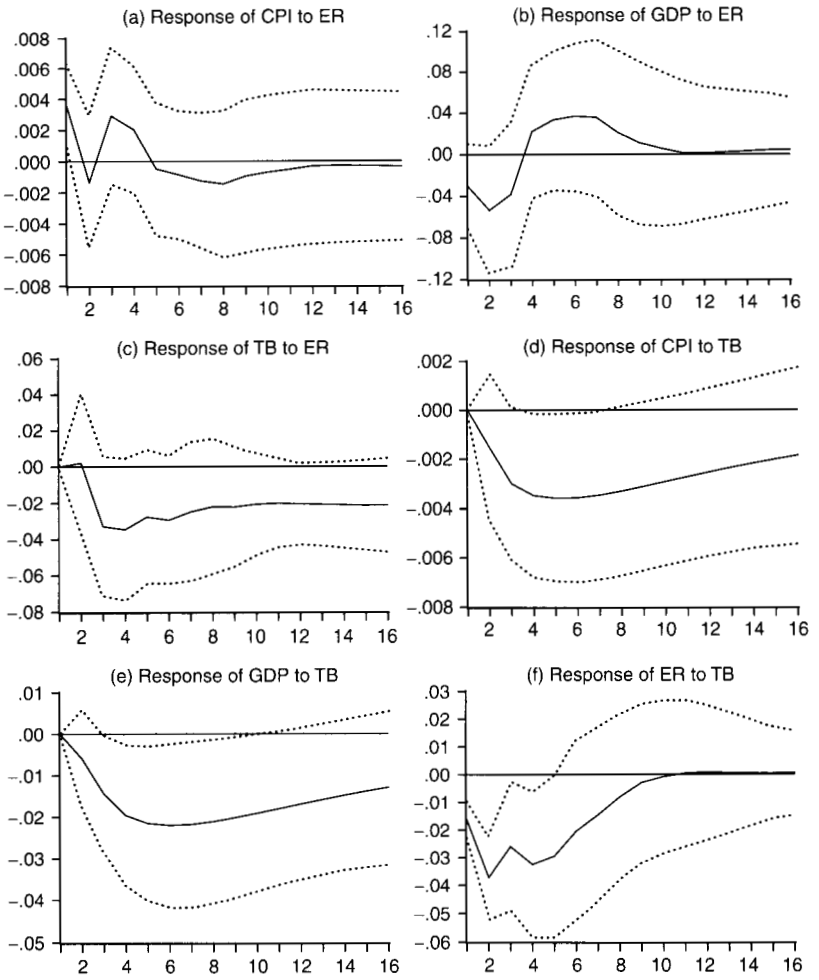

Figure 5.4 Impulse response functions – Morocco

Note: Refer to Figure 5.1.

Source: Author's estimates.

and this effect appears to be quite persistent. Recalling the significant negative effects of an appreciation on the price level, this suggests that the transmission of the interest rate shock on prices has occurred, at least to some extent, via the exchange rate channel. The importance of the interest rate in the transmission of exchange rate effects is also visible in the response of the GDP variable.

While the importance of the interest rate channel is not surprising, it nevertheless raises an important issue in the context of IT. If this channel plays an important role, a substantial part of the adjustment burden will fall on the growth rate of real GDP, even if the central bank considers the exchange rate to be its main monetary policy instrument. This would be particularly problematic if monetary policy were targeting the exchange rate to affect the growth rate of real GDP, since substantial interest rate responses would have potentially adverse effects on GDP, inflation and unemployment. This might undermine any future efforts to shift to the inflation target, and induce the central bank to keep targeting the real exchange rate.

The economic and monetary policies pursued in Morocco over the last few years have resulted in prices being brought under control, and in the accumulation of considerable foreign exchange reserves, making it possible to continue the process of opening up the economy to the outside world with the conclusion of free trade agreements with the EU and the US, and with a number of Arab countries through Morocco's participation in the Greater Arab Free Trade Area. However, with further balance of payments liberalisation, the monetary authority may be compelled to introduce further flexibility in the exchange rate. Fully flexible exchange rates may render the independence of monetary policy more effective, as interest rates will no longer have to shadow the interest rate of the anchor currency to which the dinar was pegged, but may be used to address domestic macroeconomic imbalances.

The main objective of Tunisia's monetary policy has been to preserve the value of the domestic currency. The intermediate objective is to match money supply growth with GDP growth. The main target of monetary policy has been the interest rate, which has played a vital role in enhancing and attracting capital inflows, and in stimulating domestic consumption and investment.

Table 5.9 indicates that all four time series for Tunisia contain unit roots and are integrated of order 1, I(1). However, given the evidence of cointegration between Tunisia's four variables (Table 5.10), a VECM model is estimated.

IRFs are next obtained from Tunisia's VECM. Figure 5.5(a) indicates that an exchange rate shock decreases prices during the first two quarters, but these revert thereafter and increase for the next four quarters. In fact, prices respond quite quickly to an appreciation of the exchange rate. This is expected, given the extensive openness of the Tunisian economy. The response of the interest rate to the appreciation of the exchange rate is rather ambiguous (Figure 5.5(b)), suggesting that the

Table 5.9 Unit root statistics – Tunisia

Variable	Lag	ADF t-statistic	KPSS(η)	Result
GDP	2	–2.18	0.17*(τ)	I(1)
CPI	2	–3.26	0.26**(τ)	I(1)
ER	3	–2.25	0.16*(τ)	I(1)
TB	1	–1.39	0.20*(τ)	I(1)

Note: Refer to Table 5.1.

Source: Author's estimates.

Table 5.10 Cointegration tests – Tunisia

Hypothesis		λ- Trace statistics	Critical values	Prob.	λ- Max-Eigen statistics	Critical values	Prob.
Null	Alternative		5%			5%	
r = 0	r ≥ 1	50.36*	40.17	0.00	29.53*	24.15	0.00
r ≤ 1	r ≥ 2	20.82	24.27	0.12	12.97	17.79	0.22
r ≤ 2	r ≥ 3	7.84	12.32	0.24	6.78	11.22	0.26
r ≤ 3	r = 4	1.06	4.13	0.35	1.06	4.12	0.35

Notes: Refer to Table 5.2. * indicates significance at the 5% level of significance.

Source: Author's estimates.

central bank has not been using the interest rate to affect the exchange rate. However, GDP declines as a result of an exchange rate appreciation, and that effect is persistent for about eight quarters (Figure 5.5(c)). The transmission effects from the exchange rate to GDP are visible and significant, reflecting again the important role that exports play in the growth experience of Tunisia. The empirical results suggest that Tunisia's exchange rate is quite effective with respect to GDP.

There is a persistent and significant fall in GDP as a result of a 1% increase in interest rates (Figure 5.5(e)). However, the decrease in GDP peters out after eight quarters. Similar dynamics are observed for prices, which also decrease permanently and do not peter out even after eight quarters (Figure 5.5(d)). Comparing the price response observed under an interest rate shock with the response to an exchange rate shock, prices respond more gradually to an interest rate shock. Moreover, an interest rate shock triggers an exchange rate depreciation of the dinar (Figure 5.5(f)), and this effect appears to be persistent in the short term only, for about five quarters.

While the importance of the interest rate channel is not surprising, given that Tunisia has targeted the interest rate to stimulate exports and

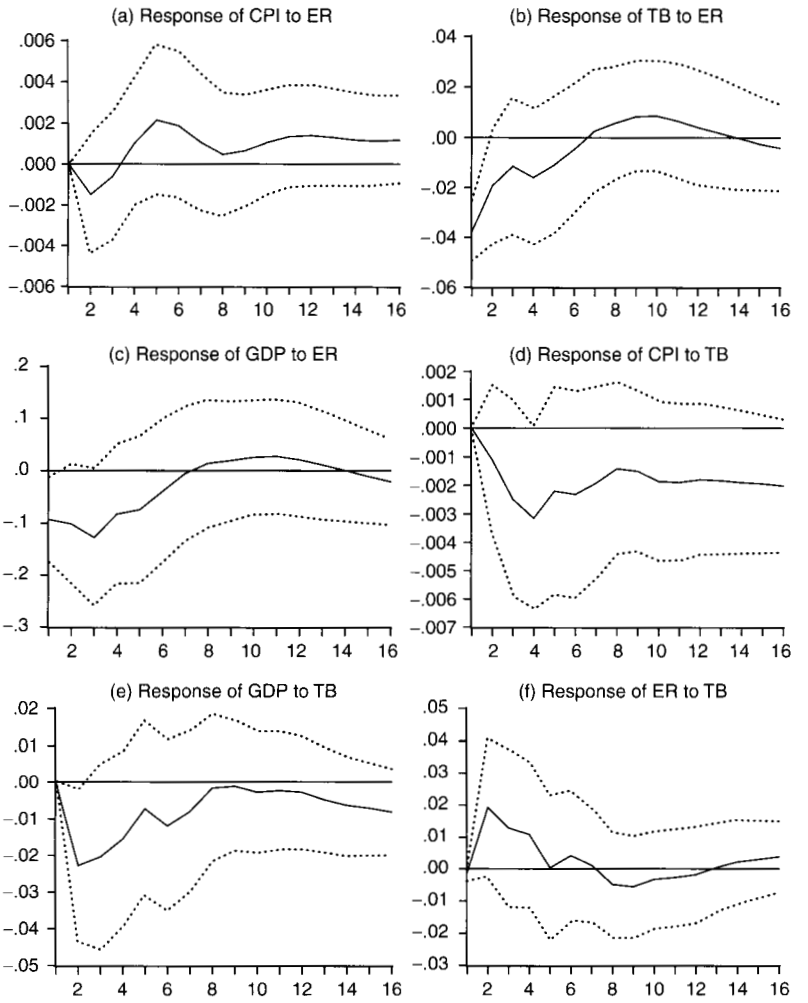

Figure 5.5 Impulse response functions – Tunisia

Note: Refer to Figure 5.1.
Source: Author's estimates.

GDP, it nevertheless raises an important issue in the context of IT. Can Tunisia shift to targeting the rate of inflation, given the consequences this move may have on the rate of growth of real GDP? This is doubtful under the current economic circumstances. Greater flexibility in the exchange rate – perhaps a controlled one-shot devaluation – should be

allowed first, to stimulate exports and ease up the pressure on interest rates. Once this is achieved, Tunisia will be able to shift to an IT mechanism with minimal costs in terms of GDP and employment. The transition from targeting output to prices needs to be accompanied by structural adjustment measures on the fiscal side.

Table 5.11 indicates that all four time series for Turkey contain a unit root and are integrated of order 1, I(1). Turkey's VAR model is therefore estimated with the variables taken in first differences, given the evidence of no cointegration between the four series (Table 5.12).

IRFs are next deduced from Turkey's VAR model in first differences. Figure 5.6(a) indicates that an exchange rate shock in Turkey leads to a permanent increase in prices. The price response to an appreciation of the exchange rate is counter-intuitive and may be explained by the high and erratic movements in both the exchange and the inflation rates over the period under consideration. It is well known that Turkey has been experiencing significant increases in its inflation rates, which culminated in the 2001 currency crisis. There is an insignificant interest rate increase in response to the appreciation of the exchange rate

Table 5.11 Unit root statistics – Turkey

Variable	Lag	ADF t-statistic	KPSS(η)	Result
GDP	8	–2.26	0.18*(τ)	I(1)
CPI	1	3.42	0.24**(τ)	I(1)
ER	3	1.62	0.23**(τ)	I(1)
TBILL	9	-2.95	0.20*(τ)	I(1)

Note: Refer to Table 5.1.

Source: Author's estimates.

Table 5.12 Cointegration tests – Turkey

Hypothesis		λ- Trace statistics	Critical values	Prob.	λ- Max-Eigen statistics	Critical values	Prob.
Null	Alternative		5%			5%	
$r = 0$	$r \geq 1$	37.20	40.17	0.09	17.48	24.15	0.30
$r \leq 1$	$r \geq 2$	19.71	24.27	0.16	13.59	17.79	0.19
$r \leq 2$	$r \geq 3$	6.11	12.32	0.42	5.73	11.22	0.38
$r \leq 3$	$r = 4$	6.37	4.12	0.60	0.37	4.12	0.60

Note: Refer to Table 5.2.

Source: Author's estimates.

(Figure 5.6(b)), suggesting that the central bank has not used the interest rate to counter movements in the exchange rate. Interest rates are already high in Turkey, and during the currency crisis of 2001 the central bank lost its last line of defence, that is, the resort to increasing the interest rate. The response of GDP to an exchange rate appreciation is also insignificant (Figure 5.6(c)), which points towards erratic increases

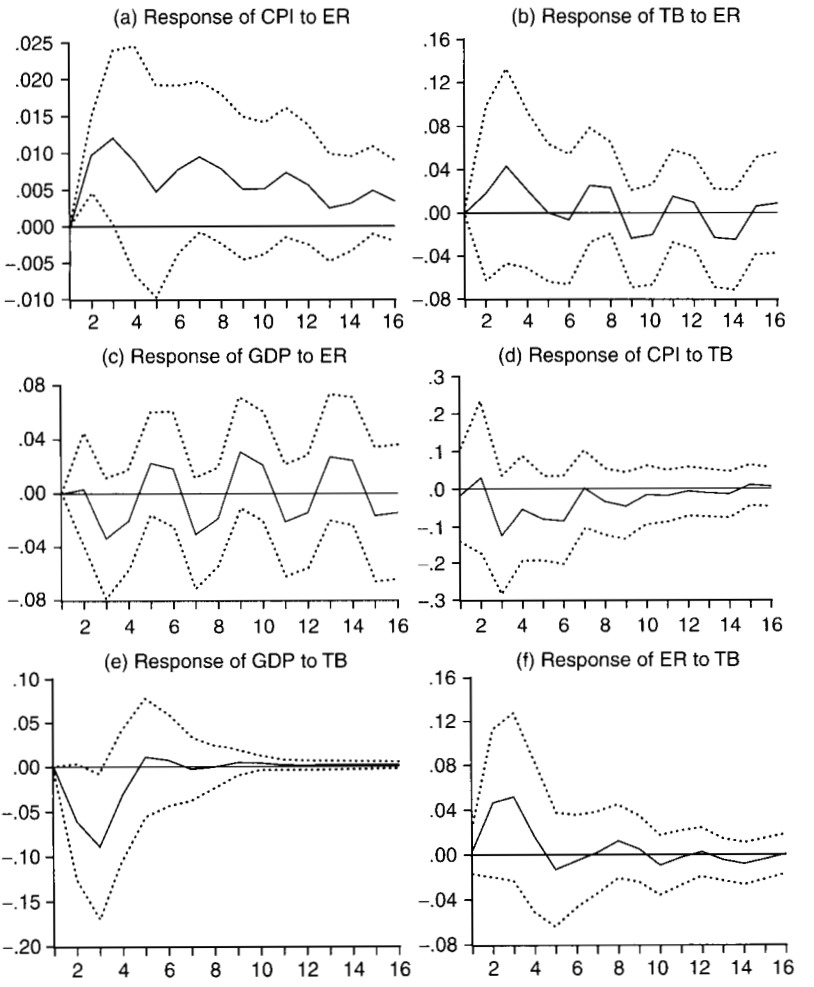

Figure 5.6 Impulse response functions – Turkey
Note: Refer to Figure 5.1.
Source: Author's estimates.

in exchange rates with no corresponding impact on GDP. Thus, the empirical results suggest that for Turkey, because of the recent currency crisis, the exchange rate is not effective with respect to GDP, inflation and interest rates.

However, there is a significant fall in GDP as a result of a 1% increase in interest rates (Figure 5.6(e)). The decrease in GDP peters out after five quarters. Similar dynamics are observed for prices, which also decrease for about seven consecutive quarters (Figure 5.6(d)). Comparing the price response observed under an interest rate shock with the response to an exchange rate shock, prices respond significantly to an interest rate shock. Moreover, an interest rate shock triggers a depreciation of the lira (Figure 5.6(f)), and this effect appears to be quite significant over the first three quarters. The importance of the interest rate effect is also visible in the response of the GDP variable. While the importance of the interest rate channel is not surprising, given that Turkey has experienced several exchange rate crises, it nevertheless raises an important issue in the context of IT. As was the case during the 2001 currency crisis, if this channel continues to play an important role, a substantial part of the adjustment burden will fall once again on the exchange rate, triggering another currency crisis. This would be particularly damaging, since monetary policy is targeting inflation. This may undermine the inflation target, and may induce the central bank to target once again the nominal exchange rate. The central bank, which has gained considerable independence during the past few years, has been working to make the IT regime a success. The recent float of the exchange rate has been one step in the right direction. However, Turkey will need to keep fiscal policy well under control; otherwise, renewed fiscal pressures may once again put pressure on interest rates, undermining the central bank's recent efforts to build up credibility and shape inflationary expectations.

5.5 Conclusion and policy implications

It is now well established in the monetary literature that targeting inflation may improve the effectiveness of monetary policy as opposed to discretionary monetary policies, which may increase uncertainty, and which may be ineffective on the real side of the economy due to the existence of time lags and other monetary and macroeconomic uncertainties. The first requirement for MENA countries considering the adoption of IT is to render their central banks more independent from political interference. Even though full independence is not required,

the monetary authorities must have the freedom to gear the instruments of monetary policy towards the inflation target without political pressure. While recent efforts in Turkey and Egypt have rendered their central banks more independent, the MENA governments of Lebanon, Jordan, Morocco and Tunisia will have to devote additional efforts towards further independence of their central banks if they wish to successfully shift their monetary policy to IT.

The second prerequisite for adopting IT is for MENA central banks to refrain from targeting the level or path of any other nominal variable, such as the nominal exchange rate. Cases in point are Jordan in the early 1990s and, more recently, Lebanon. A country that chooses a fixed exchange rate system subordinates its monetary policy to the exchange rate objective and is not able to target directly any other nominal variable, such as the rate of inflation. However, a crawling peg or exchange rate target zones may coexist with an inflation target in the short term, so long as it is clear – and central bank actions show – that the inflation target has priority if a conflict arises (see for instance, Amato and Gerlach, 2002).

The empirical results of the paper have shown that with further capital account liberalisation in Morocco, the monetary authority may be compelled to introduce further flexibility in the exchange rate. Fully flexible exchange rates may render the independence of monetary policy more effective, as interest rates will no longer have to shadow the interest rate of the anchor currency to which the dinar was pegged, but may be used towards addressing domestic macroeconomic imbalances. Only then can Morocco shift to IT. Similarly, in Tunisia, greater flexibility in the exchange rate should be allowed, to stimulate exports and ease the pressure on interest rates. Once this is achieved, Tunisia will be able to shift to an IT mechanism with minimal costs in terms of GDP and employment. The transition from targeting output to prices needs to be accompanied by structural adjustment measures on the fiscal side.

By recently allowing more flexibility in its exchange rate, Egypt was able to stimulate exports, and subsequently the growth rate of real GDP. Egypt's central bank has successfully managed the nominal exchange-rate to achieve a certain level of the real exchange rate, and has subsequently maintained external competitiveness. At the same time, the central bank has recently benefited from increased monetary policy independence. Similar dynamics are observed in Turkey. Flexible exchange rates paved the way for the central bank to shift smoothly to targeting inflation. While the success of the IT policy shift in Egypt

will depend on the ability of the central bank to isolate the real side of the economy from nominal domestic and foreign shocks, its success in Turkey will depend on the ability to isolate the monetary side of the economy from weaknesses emanating from a weak public sector. Turkey should continue with its efforts to reduce the heavy debt burden and its related service costs if it is to avoid further increases in interest rates and preserve the inflation target.

Lebanon's fiscal stance is quite similar to Turkey's. So far, Lebanon's central bank has succeeded in managing the heavy debt burden and the recurrent budget and current account deficits while maintaining exchange rate stability. Through the use of the TB rate, and the management of foreign exchange reserves, the central bank was able to achieve the above stated objective. Moreover, both the recent accumulation of a sizable stock of external debt and the high degree of dollarisation of Lebanon's economy have increased the risk of transforming the exchange rate into a nominal anchor for monetary policy that takes precedence over the inflation target. Therefore, if the monetary authority wants to shift to IT, it will have to adopt a transparent policy of smoothing short-term exchange rate fluctuations, while making it clear to the public that it will allow the exchange rate to reach its equilibrium level in the long term. Moreover, to be able to shift costlessly to a monetary policy that targets the inflation rate, the central bank will have to first stop targeting the nominal exchange rate by allowing it to float, and allow the monetary authority greater independence. This, however, can only be achieved after the fiscal stance is put back on a sustainable path. In addition, with the accumulation of a sizable external debt, and in order to keep debt service under control, targeting the nominal exchange rate may prove to be optimal at least in the short term to avert an imminent currency and debt crisis.

Other empirical results have highlighted the fact that for the economies of Egypt and Turkey, the exchange rate played a dominant role in the transmission mechanism of monetary policy, while for Jordan, Lebanon, Morocco and Tunisia, the interest rate played a dominant role in the transmission mechanism of monetary policy. These results have also pointed to the important role of the exchange rate and interest rate as policy instruments in the transmission mechanism of these MENA countries' monetary policies. While the direct links between the interest and inflation rates do not appear to be significant for Jordan, Lebanon and Turkey, they are particularly significant for Egypt, Morocco and Tunisia. In fact, there remains substantial uncertainty as to the extent to which the interest rate works through the exchange rate or through GDP

to reduce inflation. In the context of the transition to IT mechanisms of monetary policy for some MENA countries, this points to risks that the exchange rate or GDP could be overburdened by a potential transition to targeting inflation. In other words, the by-product could be further declines in the rate of growth of GDP and further appreciations of the exchange rate, with further deterioration in the current account and in economic activity. To avoid potential exchange rate overvaluations and renewed recessionary pressures, some flexibility in the inflation target may be required at least in the short term.

With the further integration of the MENA region into the world economy, the increased regional and inter-regional monetary and financial economic integration, and the fast liberalisation of their respective capital accounts, Jordan and Lebanon's central banks should consider shifting to more flexible exchange rate regimes if they wish to render their monetary policies more independent. An independent monetary policy constitutes an important strategy that needs to be implemented before IT can be adopted. Moreover, given the high debt levels accumulated in both countries, monetary policy set by the central bank should optimally interact in the future with public debt policy determined by the fiscal authorities, in order not to undermine any potential decision to shift to a monetary policy regime that targets inflation.

Notes

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1. See Mansoorian and Neaime (2002, 2003) and Neaime and Paschakis (2002).
2. See also Neaime (2000, 2001).
3. The relationship between fixed exchange rates, perfect capital mobility and independence of monetary policy – usually referred to as the 'impossible trinity', as the three cannot exist at the same point in time – is considered the main reason for the European Monetary System (EMS) crisis of 1992, as well as the breakdown of the Argentinean currency board, in addition to the 1998 Russian crisis and the 2001 Turkish crisis.
4. The oil-exporting Gulf Cooperation Council (GCC) MENA countries have been excluded from our sample on account of the structure of their economies, which are the least diversified of the MENA region.

5. Having country-specific identification procedures would lengthen the paper and would not add much to the empirical results obtained. Different identification procedures were previously estimated, and the added empirical value was not significant.
6. Generally speaking, lag length criteria such as the Akaike and Schwartz statistics are not without shortcomings and should be used more as a guide than hard-and-fast rules. Ramaswamy and Sløk (1997) used two lags in their cross-country comparison of monetary transmission in the EU, as did Bayoumi and Morsink (2001) in their analysis for Japan.
7. There is, however, recent evidence (see, for instance, Maziad, 2009) that Jordan has developed some limited monetary independence despite the peg to the dollar.

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6

Monetary Transmission Mechanisms: The Credit versus the Interest Rate Channel

Adel Boughrara and Samir Ghazouani

6.1 Introduction

A critical element of the monetary policy process is knowledge of the quantitative effects of policy actions. In recent years, much attention in the literature devoted to developed countries has been given to the role of credit markets, especially the role of banks (Kashyap et al., 1993; Kashyap and Stein, 1994). Moreover, the theoretical literature has been developed on the basis of recent developments in financial contracts under asymmetrical information, and empirical research has increasingly included financial variables in the analysis of the effectiveness of monetary policy, especially bank lending.

Three alternative views of the role of banks in the monetary transmission mechanism (MTM) have been proposed in the literature. First, there is the standard money view of monetary policy, where bank loans have no special role. Monetary shocks affect output through changes in monetary aggregates, as in the traditional IS-LM model. Bank loans are simply determined by demand and consequently tend to move with investment and output. In this case we can think of money causing both output and lending. The second view is that banks act as a narrow credit channel or lending channel (Bernanke and Blinder, 1988). Under this explanation contractionary monetary policy changes directly affect banks' balance sheets through a reduction in bank loans, which in turn affect output. In this case, output changes are directly caused by changes in bank loans. The bank lending channel operates as follows: subsequent to a monetary tightening, the reserves of banks decrease and bank deposits fall because of reserve requirements. If the decline in deposits cannot be offset by other funds (for instance, non-deposit funds that are not

subject to reserve requirements) or by a decline in banks' securities holdings, the interest rate may increase and the loan supply fall, and thereby real activity will decrease. The third view is that banks act as a broad credit channel. According to this view is monetary policy affects interest rates and output in a way similar to the money channel or influences output through a different channel. A monetary tightening reduces firms' collateral or cash flow, which makes it more risky to lend to some firms and implies a flight to quality in lending.

Despite the revival of interest in the role of banks in monetary policy over the last two decades, the precise role played by banks in that process remains a subject of controversy. Interest in the 'bank lending channel' view has been boosted by the growing literature on asymmetric information in financial markets, and also by the fact that large fluctuations in the aggregate economy are often brought about by small shocks, as in the hypothesis of the financial accelerator (Bernanke et al., 1996). This revival of interest has been intensified by the Asian currency crisis and its aftermath. According to the bank lending channel view, the role of banks in propagating monetary policy impulses emanates not only from their liabilities but also from their assets. Studies of the bank lending channel are chiefly motivated by the fact that monetary tightening can have distributional consequences. While bank loans are a primary source of finance to small and medium-sized firms (SMEs), large firms have a variety of financial sources. They can obtain finance from the financial markets. As a consequence, SMEs will bear the full brunt of the cutback of bank loans. The knowledge of the existence of the lending channel can help the authorities to pursue relevant policy actions. If bank capital is depleted in recessions, the lending channel becomes weaker and, consequently, conventional prescriptions for a recession might not work. The injection of capital into the banking sector might be a better option than expansionary monetary and/or fiscal policy.

While monetary policy in the Middle East and North Africa (MENA) region remains under-researched in general, this is especially true of MTMs and in particular of the strategic importance of the role of banks in propagating monetary policy impulses. Current thinking about the way monetary policy is transmitted to the real economy is still unclear, and the empirical evidence is still scarce and tends to be limited to the aggregate economy. Nevertheless, companies in the majority of MENA countries are still bank-dependent and the presence of financial frictions – specifically credit rationing – has often been mentioned. Under these circumstances, it is plausible that the credit channel is an important channel of monetary transmission. This channel is expected

to play an important role when capital markets are underdeveloped or when access to financial markets is limited (Kashyap et al., 1993). A weak regulatory framework or a lack of transparency in accounting standards could make investors even more reluctant to buy non-insured bank debt.

This paper attempts to overcome the methodological shortcomings in previous studies by making use of micro-data on banks' balance sheets for four MENA countries, namely Egypt, Jordan, Morocco and Tunisia. More specifically, this paper aims to answer the following questions: 1) How do banks in MENA countries react to a tightening of policy? 2) Do MENA banks' characteristics (size, capitalisation, liquidity, etc.) play a specific role in transmitting monetary policy impulses? If so, how can policymakers take advantage of these characteristics when designing their monetary policies?

The paper is organised as follows. Section 6.2 is intended to shed some light on the theoretical identification of the bank lending channel; it presents a theoretical background that constitutes a base for understanding the pure mechanism of the bank lending channel. Section 6.3 provides a literature review on the empirical evidence of the bank lending channel around the world. Section 6.4 presents some information about the reality of bank lending in the MENA region as well as a brief description of how monetary policy, in general, is organised in the four countries included in this study. Section 6.5 establishes the theoretical framework to be exploited here. The econometric modelling as well as a description of the dataset and variables used appear in Section 6.6. The empirical results and the main policy implications are discussed in Section 6.7. Section 6.8 reports the main findings and concludes.

6.2 The bank lending channel: identification through heterogeneity

There is a wide agreement between central bankers and economists that monetary policy works through interest rates. A restrictive monetary policy induces an increase in interest rates, which in turn leads to a reduction in spending in interest-sensitive sectors of the economy such as housing and consumer durables. This is the so-called interest rate channel or money view. In this standard view of the transmission mechanism there is nothing special about bank lending. The interest rate mechanism does not depend on the types of assets banks hold. The same reaction would take place regardless of the share of loans or securities held by banks (Bernanke and Blinder, 1988). The interest rate

channel describes the effects of monetary policy on investment and saving when financial markets are complete. Changes in monetary policy trigger changes in the cost of capital and the yield on savings, which in turn exert an influence on spending decisions.

On the other hand, monetary policy may directly limit the ability of banks to make new loans, making credit less available to borrowers who are more dependent on bank financing. Restrictive monetary policy works not only by raising interest rates but also by directly restricting bank credit. This is the so-called credit channel or credit view. This idea dates back to the 1950s. The chief characteristic of this view is that restrictive monetary policy can depress economic activity without large changes in interest rates. Such a process takes place via a reduction in banks' ability to supply loans, which forces firms to reduce their spending. The credit channel view emphasises the importance of banks in propagating monetary policy impulses. Unlike the interest rate channel view, the credit channel view relies on the fact that financial markets are incomplete. Although these two views differ in stressing the relevance of financial considerations, they are none the less deemed complementary, and consequently can coexist simultaneously.

The credit channel can be split into two basic channels of monetary transmission resulting from information problems in credit markets: the bank lending channel and the balance sheet channel (Kashyap and Stein, 2000). When the monetary authorities pursue an expansionary monetary policy, banks' reserves and deposits increase, which in turn brings about an increase in the quantity of bank loans available. Under such circumstances, the bank lending channel may be operative, and eventually this increase in loans will bring about a rise in investment spending. A chief implication of the credit view is that monetary policy will have a greater effect on the expenditures of (small) firms that are more dependent on bank loans than on (large) firms that can easily obtain finance in the stock and bond markets.

As for the balance sheet channel, it arises from the presence of asymmetric information in credit markets, particularly with respect to adverse selection and moral hazard. The lower the net worth of firms, the more severe are the adverse selection and moral hazard problems involved in lending to these firms. Lower net worth reduces the collateral for loans, and so losses from adverse selection are higher. A decline in net worth, which raises the adverse selection problem, thus leads to decreased lending and investment. Expansionary monetary policy, which causes a rise in equity prices, raises the net worth of firms and so leads to higher investment spending and aggregate demand because

of the decrease in adverse selection and moral hazard problems. An important feature is that it is the nominal interest rate that tends to affect firms' cash flow the most, because long-term debt is typically fixed and thus has little impact on firms' cash flow.

Several economists, using aggregate time series data, have attempted to identify the credit channel by studying the behaviour of the credit aggregate following a monetary tightening (Bernanke and Blinder, 1992; Kashyap and Stein, 1994; King, 1986; Ramey, 1993; Romer and Romer, 1990). They found, using the VAR methodology, that an unanticipated rise in the interest rate (the measure of the stance of monetary policy) is followed by a decline in loans. At first glance, the decline in bank loans seems to be consistent with the credit view. From the credit proponents' view, a restrictive policy shifts the loan supply curve left, pushing down the quantity of loans supplied by banks. Surprising though it may seem, however, the same result would occur (loans decline) even if the credit channel is not operative. A restrictive monetary policy could shift the loan demand curve leftward, causing a decline in bank loans; this process is fully consistent with the interest rate channel view. In fact, subsequent to a monetary tightening, money demand declines, and bank loans contract because of the high correlation between monetary and credit aggregates. Thus, the movements of different schedules give rise to the same phenomenon, namely the contraction of loans, which has been described in the literature as the supply–demand puzzle; it implies that bank loan contraction is consistent with both lending and interest rate channels. In short, the evidence that loans contract subsequent to a monetary tightening is not sufficient to prove the presence of the bank lending channel.

One way to check whether the bank lending channel is operative or not would be to attempt to identify whether bank loan contraction corresponds to a leftward supply curve shift or rather to a leftward demand curve shift. If the bank lending channel is at work, a monetary tightening will shift the supply schedule of bank loans. However, the same policy action could trigger a parallel move in supply and demand curves, which would reflect the coexistence of both lending channel and interest rate channel. Bank loan contraction, of itself, is not necessarily a consequence of a leftward shift in the supply schedule.

Another approach would consist in relying on the cross-sectional implications of the bank lending channel. Individual bank balance sheet data may be used in order to test empirically the implication of the lending channel. The idea behind this approach is that monetary policy shocks should have an asymmetric impact on bank lending if the

bank lending channel is operative. The differences in bank responses to the same policy shock occur due to variations in the financial strength of bank balance sheets and in the ability of the banks to replace insured deposits by external funds. The banks' ability to replace deposits with other forms of financing depends heavily on the strength of their balance sheets. In other words, this approach relies on the hypothesis that some bank-specific characteristics influence only loan supply and not loan demand. Thus, the sensitivity of loan supply to monetary policy actions can be captured by these characteristics. Three main characteristics have been suggested in the literature, namely size, capitalisation and liquidity.[1] With respect to the microeconomic foundations that may affect the strength of the bank lending channel, the following two conditions must hold (Bernanke and Blinder, 1988; Kashyap and Stein, 1995): 1) firms should not be able to completely compensate the reduced supply of commercial bank loans from other sources, such as borrowing from the public via bonds; 2) monetary policy actions are effective in altering loan supply: in other words, banks must not be able to offset the decrease in deposits brought about by a restrictive monetary policy by raising funds from any other source such as getting finance from financial markets. While the first condition seems easier to check, the second requires careful empirical examination, since it may differ from one country to another. Institutional arrangements in the banking sector may weaken the power of the bank lending channel. Two of the most important such arrangements are capital adequacy regulation and the participation of non-banking financial institutions in loan supply. Capital adequacy regulation restricts the supply of loans that a bank can make by the amount of available capital and leaves less room for loans to respond to monetary policy. The central bank also cannot control loans issued by non-banking financial institutions, which implies a lower overall capacity to affect loans to the economy.

6.3 Literature review

The difficulty in identifying empirically the bank lending channel using aggregate time series data has led some researchers to resort to a new methodology based on the panel data approach. Kashyap and Stein (1995) provided the starting point for this new strand of empirical literature, which received a major impetus from the availability of disaggregated data, mainly in the US and the European Union (EU). Kashyap and Stein (1995) sought to assess the impact of a monetary tightening on the volume of bank loans using US data. Specifically, they tested the

hypothesis that a monetary contraction reduces the lending volume of small banks more than that of large banks. However, their methodology suffers from one limitation: banks with large buffer stocks of liquid assets can insulate their loans from the effects of monetary policy actions. For a bank of a given size, the more liquid assets it has, the less a contractionary monetary policy would cause loans to decline. In order to improve the inference, Kashyap and Stein (2000) introduced the liquidity characteristic in their analysis. They reported that small banks are on average more liquid than large banks and this may mitigate the effectiveness of the bank lending channel for them. Thus, in separating banks not only by size but also by liquidity, they found that small banks with the least liquid balance sheets were most responsive to policy actions.

Kishan and Opiela (2000) extended the above analysis by considering banks' degree of capitalisation. Bank capital is an indicator of bank health and therefore an indicator of a bank's ability to raise funds from alternative sources during contractionary monetary policy periods. Moreover, prudential supervision, and in particular capital adequacy requirements, may affect the composition of bank asset portfolios in the sense that well capitalised banks are less constrained during periods of tight monetary policy, since these banks can, to some extent, isolate their loan portfolio from monetary shocks. The authors showed empirically, using US quarterly data over the period 1980:1–1995:4 for 13,042 commercial banks, that the smallest and least capitalised banks are the most responsive to monetary policy. For large banks, however, responses to monetary policy impulses are not significant, which implies that the bank lending channel may not hold overall.

Empirical studies on the bank lending channel using individual bank data began to appear in Europe with De Bondt (1998, 1999). However, these two studies did not produce a clear-cut conclusion, since the results were dependent on the monetary policy indicator as well as on the econometric methodology used. Favero et al. (1999) investigated the response of bank loans to a monetary tightening in 1992 in France, Germany, Italy and Spain. They found no evidence of the bank lending channel in any country they considered.

Adopting the same approach as Kashyap and Stein (1995), Altunbas et al. (2002) investigated the existence of the lending channel using annual data covering the period 1991–9 across eleven European countries. The econometric methodology used is different from those of past studies. The authors considered an autoregressive distributed lag (ARDL) model for loans where changes are regressed on the lagged value as well as on

current and lagged values of changes in the monetary policy measure, growth in bank securities holding and growth in interbank borrowing. They ran three additional regressions for deposits, securities and interbank borrowing in order to identify which balance sheet item was the most responsible for the policy. The models were estimated through the random effects panel data approach. The authors concluded that undercapitalised banks (of any size) tend to respond more to changes in policy. As far as the individual country banking systems of France, Germany, Italy and Spain were concerned, in contrast to previous research, their empirical results found evidence for the bank lending channel in Italy and Spain.

Recently, individual country analysis has been emphasised. For instance, in the case of the Netherlands, De Haan (2001) estimated a structural model using individual quarterly bank data over the period 1990:1–1997:4 for twenty-five banks. This analysis made a distinction between different types of loan (loans with and without state guarantees, loans to households and to firms, long-term and short-term loans). It also distinguished between demand deposits and time deposits. In addition to bank characteristics, the author investigated the strength of the lending channel according to banks' market orientation (retail banking, wholesale banking and foreign banking). The author estimated a dynamic panel specification by the generalised method of moments (GMM) suggested by Arellano and Bond (1991). He came to the conclusion that the lending channel is operative in the Netherlands; better still, he argued that the impact of monetary policy may depend on the market segment in which a bank operates. More specifically, he showed that monetary actions have more effect on banks lending to firms than on those lending to households.

Similar studies for Greece by Brissimis et al. (2003) and for Portugal by Farinha and Marquez (2003) confirmed the existence of an operative bank lending channel. Brissimis et al. (2003) ran regressions of a structural model that separated long- and short-term dynamics for twelve banks, using monthly data over the period 1995:01–1999:12. The authors considered only liquidity and size as bank characteristics, and estimated their model by the seemingly unrelated regression (SUR) weighted least squares method. They concluded that large and liquid banks shield themselves from the effects of monetary tightening. Farinha and Marquez (2003) made use of an econometric methodology substantially different from most studies by estimating a structural model while taking into explicit consideration long- and short-term relationships. The estimation was carried out with the pooled-OLS (POLS) method

developed by Chiang and Kao (2001) with quarterly data for eighteen Portuguese banks' balance sheets over the period 1990:1–1998:4. Their findings corroborated the hypothesis that the bank lending channel was operating via bank balance sheets in Portugal.

Gambacorta (2005) took up the question of whether banks react differently to monetary policy shocks in Italy. The model the author used was very similar to that used by Kashyap and Stein (1995). Loan growth is regressed on a monetary policy indicator as well as the interaction of that indicator with bank characteristics, banks' securities holding, and inflation and GDP growth to control for demand effects. The model allowed for fixed effects across banks and was estimated by GMM on quarterly data covering the period 1986:1–2001:4. The author found that the bank lending channel is operative in Italy. He showed also that the impact of monetary policy on total deposits is greatest for less capitalised banks. However, he provided contrary evidence as regards the role of bank size. Specifically, he found that bank size appears to be irrelevant, and small banks are not more sensitive to policy than large banks.

Hosono (2006) examined how banks' responses to monetary policy vary according to their balance sheets, using annual Japanese bank data covering the period 1975–99. Estimating a fixed bank effects model by the GMM two-step method, he found evidence that supports the lending channel for banks that are smaller, less liquid and more abundant in capital.

Pruteanu-Podpiera (2007) studied the effects of monetary policy changes on loans and characteristics of loan supply, using a panel of quarterly time series data for thirty-three Czech commercial banks over the period 1996:1–2001:4. She concluded that the bank lending channel was operative. The fixed effects model used, which is very similar in spirit to that used by Kashyap and Stein (1995) and Altunbas et al. (2002), was estimated by GMM.

In a comparative analysis, Matousek and Sarantis (2009) considered the impact of monetary policy on loan supply, assessing the possible differences in this effect in relation to banks' size, capital strength, liquidity and ownership structure in eight Central and Eastern European (CEE) countries[2] that had joined the EU. For each country, a panel data of banks observed annually over the period 1994–2003 constituted the basis for the econometric modelling where estimations of dynamic panel specifications were carried out by GMM. The bank lending channel was confirmed in all the countries, although its strength

differed from one country to another. As for bank size and liquidity, the empirical results confirmed the important role of these characteristics in distinguishing banks' responses to monetary policy.

A few studies have dealt with the bank lending channel outside Europe and the US. For instance, Alfaro et al. (2005) showed that the lending channel was operative in Chile during the 1990s. In the same vein, Golodniuk (2006) sought to test for the bank lending channel in Ukraine using a sample of 149 banks over the period 1998–2003. The econometric specification used was the same as that of Altunbas et al. (2002). Since securities holding was not found to be significant, the author considered instead interbank borrowing. The model, which allowed for fixed effects, was estimated by GMM. The results provided evidence for the lending channel in Ukraine and showed that the higher its capitalisation the less sensitive a bank is to changes in monetary policy.

Empirical investigations into the relevance of the bank lending channel in MENA countries are lacking. As far as we know, Sengonul and Thorbecke (2005) is the only exception. In this research, the authors investigated how monetary policy affects bank lending in Turkey using monthly balance sheet data for a sample of sixty banks over the period 1997:01–2001:06. They found that restrictive policies reduce lending more at banks with less liquid balance sheets. Finally, it is worth noting that to the best of our knowledge no single study has dealt with the issue in Arab countries despite its strategic importance for the design of these countries' monetary policies.

6.4 The lending channel and monetary policy in MENA countries: an overview

While monetary policy in MENA countries remains under-researched, this is especially true of the strategic importance of the role of banks in propagating monetary impulses. There is little research on developing countries, and even less on MENA countries. In the majority of the latter, companies are still bank-dependent and financial frictions such as credit rationing are considered widespread. In that case the credit channel may well be an important channel of monetary transmission, since this channel is expected to play an important role when capital markets are underdeveloped and access to financial markets is limited (Kashyap et al., 1993). In addition, a weak regulatory framework or a lack of transparency in accounting standards may make investors reluctant to buy non-insured bank debt.

A priori one may expect the lending channel to be operative in MENA countries, and many arguments support this belief. The number of bank-dependent borrowers and specifically SMEs is high. For instance, in 2004 the proportion of SMEs in the total number of firms in Egypt, Jordan, Morocco and Tunisia was estimated to be, respectively, 90%, 93%, 86% and 83%. Due to the high cost of direct finance relative to their overall financing needs, SMEs are likely to be bank-dependent.

Besides, the importance of financial markets in facilitating economic policies is widely accepted. The development of an efficient and liquid money market – that is, the market for treasury bills (TBs), certificates of deposits (CDs) and interbank deposits – allows monetary policy to operate through interest rates. In most MENA countries, financial markets as well as short-term securities markets are still underdeveloped, and corporate bond markets are even less developed. The underdeveloped nature of these markets has deep implications for the design and conduct of monetary policy. Thus, subsequent to restrictive monetary policy, MENA banks are inclined to cut back on the amount of loans they make, given that other options – selling some of their security holdings (TBs) or raising more non-deposit financing (CDs, bonds or equity) – cannot be pursued. In spite of a number of similarities between the four MENA countries (underdeveloped financial markets, lack of transparency, weak credibility of monetary authorities, etc.), the conduct of monetary policy differs from one country to another. It is worth noting that one key feature that characterises the four countries is their independent monetary policy (that is, they can set their own policy rate to meet their objectives). In what follows, we describe in some detail the conduct of monetary policy in each country considered in this study.

Egypt: The Egyptian monetary authority chose to target the exchange rate, as did most MENA countries. This policy used the exchange rate as the anchor for its economic programme. A severe macroeconomic crisis prompted policymakers to embark on a series of monetary and financial reforms. At the end of 1999, the Egyptian monetary authority adopted a crawling peg regime as a strategy for giving greater flexibility to the exchange rate regime. In addition, the Central Bank of Egypt (CBE) started to pursue tight monetary policy aimed at stabilising the economy and reducing inflation rates. The monetary authority occasionally intervened in the market to maintain the exchange rate within the bands specified in the policy. By 2003, exchange rate

stability had been replaced by price stability, and inflation had become the CBE's primary target. In 2006, Egypt still had no explicitly stated nominal anchor, but was rather monitoring a range of indicators in conducting its monetary policy. The CBE intends to put in place a formal inflation targeting framework to anchor monetary policy once the fundamental prerequisites are met. During the transition period, the CBE intends to meet its inflation objectives by adjusting short-term interest rates, keeping in view the developments in credit and money supply, as well as a host of other factors that may influence the underlying rate of inflation. In order to regulate the money supply and control price rises, the CBE has introduced corridor rates for overnight deposit and lending since 2004. It has recently established an interbank market for foreign exchange, which is a prerequisite for Egypt's transition to a unified flexible exchange rate system.

Jordan: Jordanian monetary policy has as its aim the preservation of the stability of its currency. Its primary objective is to maintain a pegged exchange rate with the US dollar (USD). Official interest rates have moved and continue to move in reaction to changes in US interest rates, thus ensuring the stability of the country's international reserves. Until mid-1995, the Central Bank of Jordan (CBJ) used an intermediate monetary aggregate target (M2) to support its monetary policy objective. This framework had worked well for Jordan until 1995, when the money multiplier became more volatile, which resulted in significant errors in the forecasting of the reserve money level. It seems that the central bank policymakers' preoccupation with preserving confidence in the local economy, through stable demand for the local currency (dinar) and through comfortable levels of reserves, was an uppermost concern. Since mid-1995, the CBJ has introduced an accommodating policy on reserves and the use of the CD auction rate as the operating target to achieve exchange rate stability. Thanks to imperfect asset substitutability, the CBJ has some independence in setting the interest rate spread. It targets the interest rate through varying its offering of auctioned CDs. By targeting the CD rate, the CBJ attempts to influence bank deposit and lending rates to induce changes in the demand for the local currency.

Morocco: Since the beginning of the 1990s, the role of Moroccan monetary policy has been reshaped. Credit restrictions have been relaxed and the new monetary policy has been based on indirect control instruments. The primary objective of the Moroccan monetary policy, as defined in the 2005 Bank Al-Maghrib (BAM) statutes, is the mainte-

nance of price stability. The monetary policy also seeks to ensure that the rate of growth in means of payments is sufficient to ensure that the productive sector enjoys adequate funding. The Moroccan monetary authority has started to carry out a monetary targeting strategy with announced growth rates of M3 (and recently of M1) as the main operational targets. The current practice of monetary policy implementation requires the existence of rather strict capital account restrictions. The Moroccan monetary authority officially adopted a fixed exchange rate regime in the early 1990s. Despite its official target, which consists in preserving the stability of the currency, price stability has since 2005 become one of the main concerns of Moroccan monetary policy, whose framework is still an informal quantitative framework. Since the beginning of the 1990s, the Moroccan monetary authority has decided to pursue an exchange rate policy of pegging the local currency (dirham) to an undisclosed basket of currencies. On the other hand, restrictions on capital movements are maintained. These restrictions, which are applied to residents, concern capital outflows more than inflows. The capital account restrictions have allowed the authorities to maintain the pegged exchange rate in combination with an independent monetary policy.

Tunisia: The chief objectives of Tunisian monetary policy according to the relevant legislation include preserving the value of the currency as well as supporting the economic policies of the government. To this purpose, the monetary authority decided to carry out a stability-oriented monetary policy strategy at the end of the 1980s. Monetary policy formulation has since focused on the determination of the proper growth of an intermediate aggregate according to the quantity equation of money. The target for the growth in the intermediate monetary target is derived from forecasts for the rates of change in prices and output as well as in the velocity of the intermediate target. Commitment to this target is intended to make credible the commitment to price stability. Targeting broad money growth (M2 since 1988, and M3 since January 2003), in addition to pursuing a highly managed exchange rate regime, represents the core of the current monetary framework. The Central Bank of Tunisia (BCT) derives the ancillary target for the monetary base from the growth target for broad money by assuming a stable multiplier. Considering the projected path of broad money on the one hand, and having at its disposal an estimate of the required increases in net domestic credit on the other hand, the BCT derives the credit expansion to the public sector that is deemed to be consistent with these projections and with a separate assessment of private sector credit needs.

Finally, the BCT determines the amounts of liquidity to be distributed through the refinancing facilities by taking into account the projected net international reserves as well as the credit requirement of the agricultural sector. These amounts need to be fine-tuned on a weekly basis in the light of the supposed financing needs of the commercial banks. So far, Tunisia is still maintaining relatively strict controls on capital account transactions.

6.5 Theoretical framework

The empirical test of the lending channel we intend to pursue takes Ehrmann et al.'s (2003) model as its basis. The market for bank deposits is described through an equilibrium relationship where deposits (D) are assumed to be equal to money (M), both being functions of the interest rate (MP) set by the monetary authority. Thus, the model is defined as follows:

$$M = D = -\psi MP + \chi \qquad \psi > 0 \tag{1}$$

χ being a constant.

Bank i faces a loan demand (L_i^d) that depends on economic activity (y), on the inflation rate (π) and on the loan nominal interest rate (R_L) through the following relationship:

$$L_i^d = \phi_1 y + \phi_2 \pi - \phi_3 R_L \qquad \phi_1 > 0 \quad and \quad \phi_3 > 0 \tag{2}$$

Loan demand is supposed to be positively related to economic activity, and negatively related to the loan nominal interest rate. The coefficient associated with inflation, namely ϕ_2, could be either positive or negative depending on the nature of the steady-state equilibrium in the economy.

The loan supply by bank i (L_i^s) is a function of the available amount of money (or deposits) (D), the loan nominal interest rate (R_L), and the monetary policy instrument(s) (MP), where the instrument can be either the interest rate set by the central bank or the reserve requirement rate on deposits or both. The direct impact of the policy interest rate represents the opportunity cost for banks when banks make use of the interbank market as a liquidity source. Thus, loan supply is given by the following expression:

$$L_i^s = \mu_i(x_i) D_i + \phi_4 R_L - \phi_5 MP \qquad \phi_4 > 0 \quad and \quad \phi_5 > 0 \tag{3}$$

In addition, it is assumed that not all banks are equally dependent on deposits. In particular, the model assumes that the lower are a bank's size, liquidity and capitalisation (x_i), the smaller is the impact of a change in deposits.[3] This is defined as follows:

$$\mu_i(x_i) = \mu_0 - \mu_1 x_i \tag{4}$$

The equilibrium condition in the lending market plus equations (1) to (4) result in the following reduced form of the model:

$$L_i = \frac{1}{\phi_3 + \phi_4}(\phi_1\phi_4 y + \phi_2\phi_4\pi - (\phi_5 + \mu_0\psi)\phi_3 MP + \mu_1\psi\phi_3 MPx_i + \mu_0\phi_3\chi - \mu_1\phi_3\chi x_i) \tag{5}$$

Expression (5) can be expressed in a more compact form as follows:

$$L_i = \beta_0 + \beta_1 y + \beta_2\pi - \beta_3 MP + \beta_4 MPx_i - \beta_5 x_i \tag{6}$$

Coefficients $\beta_k, k = 0,1,\cdots,5$ are determined in an appropriate manner from expression (5) as functions of initial parameters μ_0, μ_1 *and* ϕ_h, $h = 1,\cdots,5$. The coefficient β_4 shows the reaction of bank i's loans to monetary policy interacted with its characteristics (size, capitalisation and liquidity). Under the model assumptions, a significant coefficient implies that monetary policy affects the supply of loans. An implicit identifying assumption is that the interest rate loan demand elasticity does not depend on the bank characteristics (x_i). In other words, the coefficient ϕ_3 is the same for all banks. The assumption of a homogeneous reaction of the loan demand is crucial for the identification of the monetary policy effects on loan supply; it rules out the cases where, for example, small or large bank customers are more sensitive to interest rate changes. Such an assumption seems quite reasonable for the MENA countries considered in this research, in view of the fact that bank loans are the main source of finance in these countries, with few substitutes available, even for large firms (see the previous section). In addition, the empirical model allows for asymmetric responses of bank loans to changes in economic activity and inflation by interacting such variables with bank characteristics.

6.6 Econometric modelling and data description

Econometric modelling

The relevance of the bank lending channel has been a controversial issue and the results have been rather mixed and inconclusive due to a fundamental identification problem. It is not a simple task to disentangle whether

consumers and firms are more affected by a slowdown in economic activity and a subsequent reduction in credit demand or by a reduction in the loan supply as predicted by the lending channel view. A fall in aggregate lending after a monetary contraction may be driven by demand rather than supply. In that case, other transmission channels (e.g. interest rate or exchange rate) may bring about an economic downturn and bank lending may follow passively. Studies that analyse the response of aggregate credit to monetary shocks in the spirit of Bernanke and Blinder (1992) are therefore inconclusive as regards the existence of a bank lending channel. One way to bypass this difficulty is to resort to micro-data, which make it possible for the response of bank lending to be analysed in combination with other hypotheses that follow from the underlying theoretical literature. Information asymmetries, for instance, are presumably more relevant for particular categories of borrower.

The econometric model that we intend to run relates the observed growth rate of bank loans to its own lags as well as to a monetary policy indicator, a set of control variables to account for the general economic situation (and consequently for demand factors), certain bank characteristics, and the interaction between the bank characteristics and the monetary policy indicator. The model permits us to check whether bank lending responds to monetary policy shocks and, if so, whether there are important cross-sectional differences in the responses of banks with varying characteristics. In order to perform this analysis, we use as bank characteristics size, capitalisation and liquidity. The model specification also captures the existence of linear relationships between bank characteristics and bank lending. Thus, the underlying econometric model is written as follows:

$$\Delta \log L_{i,t} = \xi_i + \delta_1 \Delta \log L_{i,t-1} + \sum_{j=0}^{p} \alpha_j \Delta MP_{t-j} + \gamma^{x} x_{i,t-1} + \sum_{j=0}^{p} \varphi_j^{x} \Delta MP_{t-j} x_{i,t-1}$$
$$\sum_{j=0}^{p} \omega_j \pi_{t-j} + \sum_{j=0}^{p} \eta_j g_{t-j} + \varepsilon_{i,t} \qquad (7)$$

Individual banks are denoted i ($i = 1, \cdots, N$), and t ($t = 1, \ldots T_i$) indicates the time observation for each variable. T_i is the number of time periods available for each bank i, and p is the number of lags. $L_{i,t}$ is the amount of loans by bank i in year t to private non-banks. ΔMP represents the first difference of the nominal short-term interest rate used as a measure of monetary policy. g and π are, respectively, the annual growth rate of real GDP and the annual inflation rate. Inflation and the growth rate of

real GDP are included to control for economic activity and cyclical patterns. Finally, fixed effects across banks are measured by the intercept ξ_i. It is worth noting that since we are working with annual data, the maximum lag that has been considered is one year (p = 1). This is consistent with the idea that monetary policy shocks can propagate for no longer than one year. The coefficients on the variable ΔMP determine a response to a monetary shock by a representative bank. Bank-specific characteristics are given by the x_i variables such that $x_i \in$ {size, liquidity, capitalisation}. It is assumed that bank characteristics will affect the loan growth rate in a linear fashion. Besides, bank-specific characteristics are allowed to interact with the monetary policy indicator. The coefficients on the variables $x_i \Delta MP$ describe how responses differ according to bank characteristics (weak and strong banks). These cross-terms allow us to test the asymmetric effects of monetary policy on individual banks. The test for the bank lending channel amounts to checking whether the coefficients of the interaction terms are statistically significant or not. If they are, the lending channel could be considered as operative. If, in addition, the coefficients on these cross-terms are positive and statistically significant while the coefficient on ΔMP is negative, then the lending channel is at work. Conversely, if the coefficients on the interaction terms do not differ significantly from zero, then there are no loan supply effects from monetary policy, at least according to this methodology. It is worth noting that bank characteristic variables, either in their linear forms or in the first-order interaction terms, have been included in their lagged forms. The rationale behind this is that bank characteristics are essentially bank balance sheet items, and as such they might be highly correlated with the loans variable $L_{i,t}$.

In order to identify the loan supply effects, three bank-specific characteristics are used: size (Size), liquidity (Liq) and capital adequacy (Cap). The three measures are calculated in the following way:

$$Size_{i,t} = \log A_{i,t} - \frac{1}{N_t}\sum_{i=1}^{N} \log A_{i,t} \tag{8}$$

$$Liq_{i,t} = \frac{LA_{i,t}}{A_{i,t}} - \frac{1}{T_i}\left(\sum_{t=1}^{T_i}\frac{1}{N_t}\left(\sum_{i=1}^{N}\frac{LA_{i,t}}{A_{i,t}}\right)\right) \tag{9}$$

$$Cap_{i,t} = \frac{E_{i,t}}{A_{i,t}} - \frac{1}{T_i}\sum_{t=1}^{T_i}\left(\frac{1}{N_t}\sum_{i=1}^{N}\frac{E_{i,t}}{A_{i,t}}\right) \tag{10}$$

Bank size is measured by the total assets variable (A) in logarithmic form. Liquidity is measured by the ratio of liquid assets (LA) to total assets, and capital adequacy is given by the ratio of equity (E) to total assets. The three measures are normalised to make the average measure of a characteristic add up to zero over all the observations. This allows us to interpret the coefficients of the monetary policy indicator directly as the overall measure of monetary policy effect on loans. It is worth noting that size is normalised with respect to the average of a specific time period, while the other two measures are normalised with respect to the entire sample average. This calculation eliminates undesirable trends in the size measure (Ehrmann et al., 2003). The interaction terms, namely SizeΔMP, LiqΔMP and CapΔMP, therefore average to zero as well, so that the parameter on x is directly interpretable as the overall monetary effect.

When estimating the model given by equation (7) above, the coefficient estimates are expected to have appropriate signs in accordance with the theoretical framework. Real GDP growth (g) enters positively while inflation (π) might exhibit a negative correlation with loan variation. So the distributional lag coefficient η associated with the g variable should at least sum to a positive number, and the one associated with the π variable, namely ω, should sum to a negative number.

The linear effects of bank liquidity and capitalisation are expected to be positive ($\gamma^x > 0$, for x=Liq and Cap, *respectively*), whereas size is expected to enter negatively ($\gamma^x < 0$, for x= *Size*). This negative sign could reflect the fact that bank loans exhibit stationary size distribution.

As for the first-order interaction terms, they measure the degree to which monetary policy is expected to be weaker among larger, more liquid or better capitalised banks. Here the underlying assumption is that size is a proxy for information friction or problems (adverse selection, moral hazard) so that smaller banks, being more opaque, have greater difficulties in restructuring their portfolio of loans and other assets ($\varphi^x > 0$, for x=Size, Liq and Cap; it is worth noting that φ^x is just $\frac{\partial^2 L_{i,t}}{\partial x_{i,t-1} \partial \Delta MP_{t-j}} > 0$) . Indeed, bank size affects the degree of information asymmetry since large banks can overcome information problems either because they can diversify risk or because they have a good reputation. Large banks are therefore less sensitive to changes in the monetary policy stance than small ones. On the other hand, banks with abundant liquid assets can draw on this liquidity as buffer stocks during contractionary monetary shocks and as a result contract loans to a lesser degree than banks with fewer liquid assets. Finally, well capitalised

banks can overcome asymmetric information problems (moral hazard and adverse selection) because they have a strong incentive to operate prudently. Hence, more capitalised banks are less sensitive to a change in monetary policy stance than less capitalised ones. MP denotes the appropriate interest rate measuring the monetary policy stance, where higher values of MP correspond to tighter monetary policy. It should be emphasised that the rationale for the first-order interaction terms is that the effect of monetary policy on bank loans should depend to a large extent on the balance sheet strength of the bank.

As already mentioned, the parameters of the model have to be estimated by the generalised method of moments (GMM). According to the available data, the treatment of incomplete panels is imperative. The available panel dataset for the four MENA countries is unbalanced, since each variable is observed over a different time period. The dynamic structure provided in the econometric specification (7) leads to more efficient and consistent estimators given by the GMM methodology. This technique, developed essentially by Arellano and Bond (1991), is increasingly used in the context of dynamic panels. It provides convergent estimators by drawing on the principles of instrumental variables. It also deals with problems of correlation between the lagged dependent variable included in the vector of explanatory variables and the error term $\varepsilon_{i,t}$, as well as between some of the explanatory variables and the unobserved bank-specific term ξ_i. As mentioned by Pruteanu-Podpiera (2007) in the context of bank lending studies, the methodology also accounts for the possible endogeneity of some variables, which probably holds for bank characteristics.

From an econometric point of view, the GMM procedure is based on a set of orthogonality conditions between the error terms and some instrumental variables. The estimation procedure is conducted so as to assure convergence of these orthogonality conditions to zero. The estimator obtained follows from a minimisation of an appropriate quadratic form. Improvements are introduced such as the two-step estimator developed by Arellano and Bond (1998). In comparison with the earlier procedures, the latter reduces the dimensionality of the instruments, which makes it possible to avoid the over-fitting risk but still takes into account the presence of heteroscedastic-consistent standard errors. The difference between one-step and two-step estimation consists in the specification of an individual-specific weighting matrix. The two-step estimation uses the one-step residuals, so it is more efficient. But Arellano and Bond (1991) mention that Monte Carlo simulations suggest that the asymptotic standard errors for the two-step estimators can

be a 'poor guide' and so the inferences should be based rather on the one-step estimators.

Consistency of the GMM estimator depends on the validity of the instruments. To address the issue we consider two specification tests suggested by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). The first is the Sargan test of over-identifying restrictions, which tests the overall validity of the instruments. Under the null hypothesis of the validity of the instruments, the statistic associated with this test has a chi-squared distribution with (J-K) degrees of freedom where J is the number of instruments and K the number of the independent variables in the regression. The second test examines the assumption of no serial correlation in error terms. We test whether the differenced error term is second-order serially correlated. Under the null hypothesis of no second-order correlation, the statistic associated with this test has a standard-normal distribution. Failure to reject the null hypotheses of both tests confirms the validity of our specifications.

Data sources and variables description

We use bank-level data from BankScope, a database maintained by International Bank Credit Analysis Ltd and the Brussels-based Bureau van Dijk. BankScope contains bank financial statements used in a number of other cross-country studies. For each MENA country considered, we use panel data including all banks, that is commercial banks, savings banks, cooperative banks, and bank holding companies. We use data from consolidated accounts, if available, and otherwise from unconsolidated accounts (to avoid double-counting). Data for a uniform period for each bank in each country were not available. Consequently, it is expected that the number of observations varies across our sample banks, so we conduct estimations over an unbalanced panel dataset. Thus, the period covered by the study varies globally from 1989 to 2007. In this dataset, we have twenty-nine banks for Egypt, eleven for Jordan, eight for Morocco, and twelve for Tunisia. Data on macroeconomic variables are drawn from the IMF-IFS database. The interest rate indicators that have been used in the empirical study are the following: for Egypt, the discount rate (sourced from IMF-IFS database, line 60); for Jordan, the interest rate on three-month certificates of deposit (sourced from the central bank of Jordan website); for Morocco, the interbank rate (sourced from Bank Al-Maghrib and also from Ministry of Finance databases); and for Tunisia, the one-year treasury bill rate (sourced from the central bank's Financial Statistics, various issues).

6.7 Empirical results

The logic we follow when estimating different specifications of the theoretical model is the following. The first-order interaction terms are included jointly in the original specification and then tested down for their joint significance; the irrelevant ones are dropped. Since the chief objective of this study is to check whether the monetary authorities can affect loan supply, it becomes necessary to account for loan demand movements. Variables such as real GDP or inflation have traditionally been added to the model for this purpose.

The estimates are reported on Tables 6.1 to 6.4. Each table reports the estimates of different specifications of equation (7) (in columns 1 through 7). Columns 1, 2 and 3 depict the estimates of model specifications that account for a single bank characteristic along with its first-order interaction with MP and MP(-1). Columns 4, 5 and 6 report the estimates of model specifications with a pair of bank characteristics. Finally, column 7 reports the estimates of a more general model specification that allows for all possible combinations. The interpretations of these results are reported below.

Egypt: Since we are primarily interested in checking the existence of the bank lending channel, it is necessary to verify on the one hand whether all the coefficients on ΔMP_{t-j} are negative, and on the other hand whether the first-order interaction coefficients are positive or not, as explained above.

As far as Egypt is concerned, it is clear from the estimates reported in Table 6.1 that the signs of the coefficients on the MP variable are as expected and statistically significant. With respect to the impact of monetary policy, we find that in all specifications (1 to 7) the long-run multipliers for monetary policy have the expected negative sign and are significantly different from zero for the average bank in the sample (according to each of the bank characteristics considered). This indicates that monetary policy, as measured by the discount rate, is effective in influencing the loan dynamics. The total (or long-run) effect of monetary policy is about 3.2,[4] which is high when compared with the results reported in studies on industrialised countries. This would signify that if the Egyptian monetary authority increases the interest rate by 1 percentage point, loans will decline by 3.2% on average.

As regards the first-order interaction terms that stand for the effects of bank characteristics on the banks' reaction to monetary policy, the empirical results suggest also that capitalisation plays an important role in shaping the reaction of banks to monetary policy. Surprisingly, the

sign is negative, which suggests that when facing a monetary policy shock, well capitalised banks display a stronger response. Liquidity is not very important in explaining the lending response to monetary policy (all liquidity measures are insignificant, that is the interaction terms $Liq_{i,t-1}\Delta MP_{t-j}$ are far from significant). On the other hand, size does seem to play a significant role in affecting the way the banks respond to monetary policy changes (although the first-order interaction terms are not statistically significant).

The effects of the macroeconomic variables that account for demand movements are robust across the different models. The long-run elasticity of credit to GDP is always significant and larger than 1. The response of credit to prices is always negative and significant. It is worth noting that the coefficient on inflation picks up both the positive effect of inflation on nominal loan growth and the potential negative effects of higher inflation via higher nominal interest rates. It seems that in the case of Egypt the second effect has the upper hand.

Jordan: The linear effects of bank size and capitalisation are respectively negative and positive as expected. The negative sign of the coefficient on size reveals a significant negative linear relationship between bank size and the growth of total client loans; this could be rationalised by the fact that bank loans exhibit a stationary size distribution. Liquidity does not seem to play an important role in shaping the reaction of Jordanian banks to policy changes; indeed, whatever specification we consider, the coefficient on liquidity is always non-significant. On another front, the distributional effects of monetary policy due to bank size appear to be significant and positive, as expected, indicating a significant non-linear relationship between size and loan growth. Still, the distributional effects of monetary policy due to capitalisation are different between the contemporary and the lagged terms as shown notably by the cross-product term coefficients (the coefficients on the variables $Cap_{t-1}MP_t$ and $Cap_{t-1}MP_{t-1}$). These coefficients alternate in sign, although the total effect (or the long-term effects) as measured by the long-term coefficient has the correct sign.[5] The different signs of these coefficients could be interpreted as follows: during the first period (at time t), and when faced with a monetary tightening, a well capitalised bank reacts more strongly than a less capitalised one. In the following period, it is rather the opposite that happens; less capitalised banks display a stronger response. It is worth noting, however, that the magnitude of the long-run effect (the overall effect) is relatively weak.

As for the effects of the macroeconomic variables, they do not seem to play any significant role in loan behaviour. These results are robust

Table 6.1 GMM-in system estimates for Egypt; one-step results

Variables	1	2	3	4	5	6	7
Loans(-1)	−0.136	0.0729	−0.186	−0.125	−0.228	0.0927	−0.183
	(0.162)	(0.301)	(0.349)	(0.155)	(0.156)	(0.125)	(0.156)
ΔMP	−2.468**	−0.237	−1.737	−1.485	−3.678***	−0.147	−2.242**
	(1.0182)	(0.87)	(1.441)	(1.113)	(1.4)	(1.137)	(1.0786)
ΔMP(−1)	−1.924**	−0.592	−2.162***	−1.97***	−2.712**	−1.0322**	−2.608***
	(0.77)	(0.959)	(0.821)	(0.623)	(1.274)	(0.527)	(0.848)
Size(−1)	−0.0614			−0.0555	−0.0513		−0.0463
	(0.0571)			(0.0557)	(0.0601)		(0.0588)
Size(−1)* ΔMP	−1.287			−1.717	−3.67		−1.592
	(1.588)			(1.731)	(2.362)		(1.48)
Size(−1)* ΔMP(−1)	−0.0646			−1.0793*	−0.62		−1.28*
	(0.757)			(0.646)	(1.427)		(0.755)
Liq(−1)		−0.00317		−0.00131		−0.00261*	−0.000581
		(0.00227)		(0.00979)		(0.00137)	(0.00125)
Liq(−1)* ΔMP		0.124		0.0974		0.0908	0.0172
		(0.111)		(0.0622)		(0.0665)	(0.0497)
Liq(−1)* ΔMP(−1)		0.0937*		0.00198		0.0263	−0.0126
		(0.0566)		(0.0531)		(0.0319)	(0.0451)
Cap(−1)			−0.012		−0.0109	−0.0106	−0.0101
			(0.014)		(0.0078)	(0.0118)	(0.00916)
Cap(−1)* ΔMP			−0.262		−0.451	−0.25	−0.24
			(0.586)		(0.372)	(0.337)	(0.265)
Cap(−1)*MP(−1)			−0.21*		−0.3	−0.0671	−0.35**
			(0.114)		(0.262)	(0.108)	(0.139)
Size(−1)*Liq(−1)* ΔMP				0.0826			
				(0.0901)			
Size(−1)*Liq(−1)* ΔMP(−1)				−0.166**			
				(0.0757)	−0.969*		
Size(−1)*Cap(−1)* ΔMP					(0.502)		
					−0.00542		
Size(−1)*Cap(−1)* ΔMP(−1)					(0.308)		

Liq(–1)*Cap(–1)* ΔMP						0.0484**	
						(0.0212)	
Liq(–1)*Cap(–1)* ΔMP(–1)						0.0196***	
						(0.00673)	
Growth	0.599	0.102	0.54	0.509	0.54	0.248	0.281
	(0.525)	(0.3)	(0.421)	(0.585)	(0.441)	(0.355)	(0.893)
Growth(–1)	0.185	0.158	0.21	0.318	0.265	0.289	–0.0588
	(0.388)	(0.282)	(0.281)	(0.36)	(0.326)	(0.262)	(0.682)
Inflation	0.281	–0.238	0.0172	0.133	0.132	–0.245	0.0253
	(0.226)	(0.235)	(0.19)	(0.282)	(0.181)	(0.235)	(0.284)
Inflation(–1)	0.467**	0.382	0.384	0.507***	0.503**	0.331	0.412
	(0.217)	(0.296)	(0.316)	(0.192)	(0.224)	(0.319)	(0.281)
Constant	–0.0464	0.0296	–0.0144	–0.0369	–0.035	0.0193	0.002
	(0.0422)	(0.041)	(0.0371)	(0.0573)	(0.0334)	(0.0403)	(0.0858)
F-Statistic	4.14***	2.05*	3.72***	4.7***	5.5***	10.13***	5.99***
Sargan test	81.51***	38.64***	51.37***	115.55***	116.51***	56.25***	104.54***
Serial correlation test	–1.7*	–1.58	–0.88	–2.33**	–1.6	–2.49**	–1.85*
No. of banks	29	29	29	29	29	29	29
No. of observations	388	388	388	388	388	388	388

Notes: This table presents the results of a one-step system GMM estimation for the available sample of twenty-nine Egyptian banks over the 1988–2007 period. The dependent variable is Loans expressed in differences of logarithms. The nature of the GMM method leads to the introduction of a lagged dependent variable (Loans(-1)). The monetary policy instrument ΔMP is measured through the discount rate expressed in differences. Beside the instantaneous effect (variable ΔMP), a lagged effect is taken into account through the introduction of a lagged variable ΔMP(-1).

Through Tables 6.1 to 6.4, banks' characteristics – size (variable Size), liquidity (variable Liq) and capitalisation (variable Cap) – are introduced either separately or together in interaction forms. For each case, the characteristic is considered in the lagged form, in a lagged form interrelated with ΔMP and in a lagged form again interrelated with ΔMP(-1).

For the Sargan test, the null hypothesis indicates that the instruments used are not correlated with the residuals.

For the test of serial correlation, the null hypothesis indicates that the errors in the first-difference regression exhibit no second-order serial correlation.

Standard errors of estimates are reported in parentheses. ***, **, and * indicate significance levels at 1%, 5%, and 10%, respectively.

Source: Authors' estimates.

Table 6.2 GMM-in system estimates for Jordan; one-step results

Variables	1	2	3	4	5	6	7
Loans(–1)	0.626***	0.207	0.193	0.752**	–0.0621	0.332**	–0.00711
	(0.117)	(0.248)	(0.185)	(0.322)	(0.33)	(0.129)	(0.287)
ΔMP	–0.408	–0.484	–0.264	–0.184	–1.0586*	–0.143	–0.88*
	(0.668)	(0.701)	(0.522)	(0.696)	(0.593)	(0.35)	(0.458)
ΔMP(–1)	0.0276	–0.172	–0.0913	–0.789	–0.122	–0.176	–0.271
	(0.357)	(0.237)	(0.303)	(0.635)	(0.543)	(0.246)	(0.483)
Size(–1)	–0.0184			0.00267	–0.0881		–0.0607
	(0.0441)			(0.0215)	(0.0689)		(0.0579)
Size(–1)* ΔMP	–0.276			0.483	1.0217**		0.545
	(0.426)			(1.0783)	(0.506)		(0.523)
Size(–1)* ΔMP(–1)	–0.204			–0.327	0.525		0.537
	(0.327)			(0.653)	(0.648)		(0.683)
Liq(–1)		–0.000409		–0.00427**		0.00094	0.00089
		(0.00136)		(0.00178)		(0.00116)	(0.00131)
Liq(–1)* ΔMP		–0.167**		0.0438		–0.053*	–0.0151
		(0.079)		(0.0643)		(0.0283)	(0.0681)
Liq(–1)* ΔMP(–1)		–0.068		–0.00357		0.0353	0.0111
		(0.057)		(0.0481)		(0.0319)	(0.034)
Cap(–1)			0.000994		0.00304	0.00229**	0.00235
			(0.000694)		(0.0034)	(0.00103)	(0.00311)
Cap(–1)* ΔMP			–0.171***		0.0483	0.0517	–0.0871
			(0.0286)		(0.301)	(0.0511)	(0.0899)
Cap(–1)* ΔMP(–1)			–0.0325		–0.00386	0.346*	0.0194
			(0.0296)		(0.278)	(0.197)	(0.11)
Size(–1)*Liq(–1)* ΔMP				0.00556			
				(0.119)			
Size(–1)*Liq(–1)* ΔMP(–1)				–0.123			
				(0.0951)			

Size(–1)*Cap(–1)* ΔMP					0.282		
					(0.416)		
Size(–1)*Cap(–1)* ΔMP(–1)					0.00587		
					(0.364)		
Liq(–1)*Cap(–1)* ΔMP						0.000364	
						(0.00272)	
Liq(–1)*Cap(–1)* ΔMP(–1)						–0.0122	
						(0.0107)	
Growth	0.422	0.825**	0.0521	–0.371	0.577	0.848**	0.646**
	(0.641)	(0.408)	(0.291)	(0.32)	(0.394)	(0.365)	(0.303)
Growth(–1)	–0.199	0.303	0.0226	–0.578*	0.168	0.276	0.278
	(0.176)	(0.271)	(0.24)	(0.32)	(0.549)	(0.176)	(0.349)
Inflation	0.22	1.426	0.682	–0.222	0.347	–0.245	0.272
	(0.93)	(0.982)	(0.677)	(0.528)	(0.737)	(0.556)	(0.404)
Inflation(–1)	–0.301	–0.419	–0.0818	–0.0709	–0.121	–0.565	–0.327
	(0.885)	(0.581)	(0.583)	(0.564)	(0.811)	0.41)	(0.611)
Constant	0.0096	–0.045	0.0216	0.0666	0.012	0.000174	0.00904
	(0.0313)	(0.0416)	(0.0257)	(0.0509)	(0.0433)	(0.0165)	(0.0283)
F–Statistic	549.67***	4.41**	728.75***	5.91***	11.7***	88.34***	20.74***
Sargan test	8.5	20.31***	35.24***	21.66	10.74	36.03*	17.03
Serial correlation test	–2.84***	–1.33*	–1.38*	–1.77**	–0.85	–2.78***	–0.76
No. of banks	11	11	11	11	11	11	11
No. of observations	142	142	142	142	142	142	142

Notes: This table presents the results of one-step system GMM estimation for the available sample of eleven Jordanian banks over the 1989–2007 period. The dependent variable is Loans expressed in differences of logarithms. The nature of GMM method leads to introduction of lagged dependent variable (Loans(-1)). The monetary policy instrument MP is measured through CD3 expressed in differences. Beside the instantaneous effect (variable ΔMP), a lagged effect is taken into account through introduction of lagged variable ΔMP(-1). For other notes, see Table 6.1.

Source: Authors' estimates.

across the different model specifications considered in Table 6.2. The long-run elasticity of credit to real GDP growth is always positive but not significant. Likewise, the response of credit to inflation is not significant, albeit positive.

With respect to monetary policy impact, we find that, in all model specifications, the long-run multipliers of monetary policy have the expected negative sign and are significantly different from zero for the average bank in the sample. Better still, this finding is robust with regard to the inclusion of each of the bank characteristics considered. In sum, the results for Jordan tend to confirm that the bank lending channel exists.

Morocco: With respect to monetary policy impact, we find that, in all model specifications, the long-run multipliers for monetary policy have the expected negative sign and are significantly different from zero for the average bank in the sample. Moreover, this finding is robust with regard to the inclusion of each of the bank characteristics considered. In sum, the results for Morocco tend to confirm the existence of the bank lending channel.

The estimation results for Morocco presented in Table 6.3 indicate that the linear relationships between monetary policy and bank characteristics (size, liquidity and capitalisation) are far from significant and this finding is robust to different model specifications. As for the distributional effects, inspection of the coefficients on the different contemporary interaction terms shows that both liquidity and size play significant roles in affecting the reaction of banks to monetary policy. As far as size is concerned, the empirical results indicate that the sign of the cross-product term $Size_{t-1}MP_t$ is negative as expected. Its p-value is about 11%, which is acceptable. As regards the distributional effects of monetary policy due to liquidity, it appears statistically significant but of different signs for the two terms considered – the interaction coefficient has a negative sign for the contemporary term and a positive sign for the lag. This means that in the current period, the more liquid the bank, the less its lending is affected by the monetary policy conditions, and in the following period, the more liquid the bank, the more its lending reacts to the monetary policy conditions.

Finally, capitalisation does not seem to affect either linearly or nonlinearly the loan growth rate. In other words, capitalisation does not make a difference to banks' reactions to monetary policy changes. Likewise, bank size does not appear to play any significant role in affecting the reaction of bank loans to monetary policy change. None of the cross-products between the size variable and the interest rate are statistically

significant. These findings do not necessarily mean a change in their lending behaviour, but when the development of interest rates is taken into account, the result could be interpreted as indicating a greater reluctance to lend on the part of the more liquid banks. That is, in the first period, which was marked by monetary policy tightening, the more liquid banks' growth rate of loans decreases more than that of the less liquid banks. Further, in the second period, characterised by a decrease in interest rates, the more liquid banks' lending grows at a slower pace than that of the less liquid banks. We would be inclined to interpret this result as pointing to a broad credit channel.

As for the effects of the macroeconomic variables, they do not seem to play any significant role in loan behaviour. These results are robust across the different model specifications considered in Table 6.3. The long-term elasticity of credit to real GDP growth is always positive but not significant. Likewise, the response of credit to inflation is non-significant, albeit positive in sign.

Tunisia: With respect to monetary policy impact, we find that, in all model specifications, the long-run multipliers for monetary policy have the expected negative sign and are significantly different from zero for the average bank in the sample. In addition, this finding is robust with regard to the inclusion of each of the bank characteristics considered. In sum, the results for Tunisia tend to confirm that the bank lending channel operates.

The most important feature of the empirical estimates in the case of Tunisia is that only the linear effect of bank size is significant and has a correct sign; the other two bank characteristics, namely capitalisation and liquidity, do not play any role, at least in their direct (linear) relationship to loan behaviour. As for the distributional effects of monetary policy due to bank characteristics, only that due to size is statistically significant. The first-order interaction terms for liquidity and capitalisation do not seem to play an important role in shaping the reaction of Tunisian banks to monetary policy changes; this finding seems to vary across the specifications. Though the cross-products of size with the monetary policy indicator alternate in sign (the coefficient on $Size_{t-1}MP_t$ is negative and that on $Size_{t-1}MP_{t-1}$ is positive), the total effect is nonetheless positive, as predicted by the theory. The negative sign signifies that the bigger the bank, the more its lending is affected by the monetary policy conditions. In contrast, the positive sign implies that the bigger the bank, the less its lending reacts to the monetary policy conditions. What is important for the policymaker is rather the total effect, which is positive, as expected, indicating that big banks react, on average, less

Table 6.3 GMM-in system estimates for Morocco; one-step results

Variables	1	2	3	4	5	6	7
Loans(–1)	0.218***	0.214*** (0.0454)	0.237***	0.26***	0.321***	0.157*	0.262***
	(0.0561)	1.344*	(0.0365)	(0.0396)	(0.0626)	(0.0838)	(0.0409)
ΔMP	1.524***	(0.697)	1.633***	2.195**	1.761***	1.79***	2.0982***
	(0.522)	–2.389	(0.414)	(0.876)	(0.61)	(0.679)	(0.686)
ΔMP(–1)	–2.799	(1.529)	–3.138	–2.657	–3.324**	–1.87	–3.0373**
	(1.758)		(1.959)	(1.663)	(1.492)	(1.608)	(1.443)
Size(–1)	–0.0163			0.0219	–0.0313		–0.00921
	(0.116)			(0.0339)	(0.0382)		(0.0663)
Size(–1)* ΔMP	2.597			2.383	3.938*		1.574
	(2.328)			(4.332)	(2.116)		(2.379)
Size(–1)* ΔMP(–1)	–5.039			0.944	–6.37		–0.634
	(5.491)			(2.889)	(4.0615)		(3.45)
Liq(–1)		0.000188		0.000564		0.000466	0.000231
		(0.000185)		(0.000357)		(0.000343)	(0.00023)
Liq(–1)* ΔMP		0.057***		0.109***		0.0281	0.0817***
		(0.0185)		(0.0299)		(0.0617)	(0.0253)
Liq(–1)* ΔMP(–1)		–0.0799***		–0.128**		0.0151	–0.0989***
		(0.0261)		(0.0557)		(0.0452)	(0.0227)
Cap(–1)			0.00414		0.0073	0.00816	0.00651
			(0.0034)		(0.00549)	(0.00773)	(0.00733)
Cap(–1)* ΔMP			–0.425		–0.47	–0.182	0.114
			(0.478)		(0.605)	(0.614)	(0.427)
Cap(–1)* ΔMP(–1)			0.8		0.995**	0.947	0.709
			(0.788)		(0.439)	(0.734)	(0.547)
Size(–1)*Liq(–1)* ΔMP				0.0609			
				(0.176)			
Size(–1)*Liq(–1)* ΔMP(–1)				0.0998			
				(0.202)			

Size(–1)*Cap(–1)* ΔMP					–3.952		
					(2.927)		
Size(–1)*Cap(–1)* ΔMP(–1)					3.766***		
					(1.132)		
Liq(–1)*Cap(–1)* ΔMP						–0.0528**	
						(0.0255)	
Liq(–1)*Cap(–1)* ΔMP(–1)						0.0463**	
						(0.0235)	
Growth	–0.0176	–0.0216	–0.0344	0.0292	0.00869	0.0179	0.0346
	(0.22)	(0.205)	(0.25)	(0.245)	(0.197)	(0.2)	(0.195)
Growth(–1)	0.0353	–0.123	–0.016	–0.0526	0.00937	0.0219	–0.0127
	(0.165)	(0.212)	(0.214)	(0.238)	(0.155)	(0.205)	(0.203)
Inflation	1.275***	0.674**	1.267***	0.503***	1.169***	0.975***	0.782***
	(0.368)	(0.332)	(0.295)	(0.217)	(0.334)	(0.372)	(0.221)
Inflation(–1)	–0.863	–0.598	–0.86*	–0.835**	–0.815*	–0.871*	–0.756*
	(0.538)	(0.477)	(0.5)	(0.415)	(0.453)	(0.462)	(0.455)
Constant	0.0231*	0.0403***	0.0225	0.0509***	0.017	0.0393***	0.0345***
	(0.0136)	(0.0134)	(0.0153)	(0.0182)	(0.0121)	(0.0121)	(0.0105)
F–Statistic	19.52***	27.84***	10***	56.4***	36.32***	4.65**	18.14***
Sargan test	102.2***	44.05**	115.21*	100.3*	76.23*	43.31*	93.64***
Serial correlation test	–1.69**	–2.03**	–1.65**	–1.81**	–1.64*	–1.7**	–1.79**
No. of banks	8 121	8 121	8 121	8	8 121	8 121	8 121
No. of observations				121			

Notes: This table presents the results of one-step system GMM estimation for the available sample of eight Moroccan banks over the 1988–2007 period. The dependent variable is Loans expressed in differences of logarithms. The nature of GMM method leads to introduction of lagged dependent variable (Loans(-1)). The monetary policy instrument is measured through the interbank rate expressed in differences. Beside the instantaneous effect (variable ΔMP), a lagged effect is taken into account through introduction of lagged variable ΔMP(-1). For other notes see Table 6.1.

Source: Authors' estimates.

Table 6.4 GMM-in system estimates for Tunisia; one-step results

Variables	1	2	3	4	5	6	7
Loans(–1)	0.401***	–0.0485	0.076	0.242**	0.21***	0.101*	0.17***
	(0.103)	(0.286)	(0.127)	(0.113)	(0.0684)	(0.0518)	(0.0557)
ΔMP	–1.576	–1.208	–0.795	–0.939**	–1.15*	–1.129*	–1.196
	(1.0216)	(1.698)	(0.627)	(0.396)	(0.636)	(0.6)	(0.772)
ΔMP(–1)	–0.866	–0.0691	0.135	0.357	0.195	0.754	0.181
	(0.971)	(1.713)	(0.559)	(0.821)	(0.636)	(0.601)	(1.0033)
Size(–1)	–0.0145			–0.0407	–0.0305***		–0.0718
	(0.0475)			(0.0562)	(0.00551)		(0.0475)
Size(–1)* ΔMP	–4.567			–2.106	–2.225*		–6.816***
	(4.413)			(1.697)	(1.176)		(2.565)
Size(–1)* ΔMP(–1)	2.734			3.956	3.91***		2.477
	(1.97)			(2.613)	(1.0764)		(2.203)
Liq(–1)		0.000312		–0.0000869		0.000262	–0.000444
		(0.000646)		(0.000469)		(0.000227)	(0.000558)
Liq(–1)* ΔMP		0.167		0.0119		–0.0119	–0.0373
		(0.212)		(0.0614)		(0.0168)	(0.034)
Liq(–1)* ΔMP(–1)		0.178		–0.0808		–0.0163	–0.0243
		(0.18)		(0.0789)		(0.0195)	(0.0226)
Cap(–1)			–0.00155		–0.00141	–0.00165	–0.000307
			(0.00236)		(0.00171)	(0.00215)	(0.00448)
Cap(–1)* ΔMP			0.114		–0.313*	0.173	–0.0624
			(0.241)		(0.183)	(0.21)	(0.225)
Cap(–1)* ΔMP(–1)			0.12		–0.0554	0.366	0.453***
			(0.144)		(0.198)	(0.31)	(0.165)
Size(–1)*Liq(–1)* ΔMP				–0.139**			
				(0.0667)			
Size(–1)*Liq(–1)* ΔMP(–1)				–0.146**			
				(0.0692)			

Size(–1)*Cap(–1)* ΔMP					–0.846***		
Size(–1)*Cap(–1)* ΔMP(–1)					(0.24)		
Liq(–1)*Cap(–1)* ΔMP					–0.654**	0.0127**	
Liq(–1)*Cap(–1)* ΔMP(–1)					(0.262)	(0.00557)	
						–0.00871	
						(0.00652)	
Growth	1.0417**	0.606	0.261	–0.186	–0.169	0.203	0.119
	(0.491)	(0.449)	(0.273)	(0.163)	(0.178)	(0.151)	(0.301)
Growth(–1)	0.153	0.224	0.129	0.00871	0.095	0.197	0.01
	(0.195)	(0.237)	(0.138)	(0.217)	(0.182)	(0.135)	(0.252)
Inflation	–0.894	0.242	0.14	–0.82	–0.276	–0.486	–0.233
	(0.688)	(1.424)	(0.558)	(0.557)	(0.451)	(0.469)	(0.598)
Inflation(–1)	–0.0167	–0.413	0.00905	0.0575	0.111	–0.376	0.355
	(0.523)	(0.732)	(0.25)	(0.312)	(0.336)	(0.371)	(0.438)
Constant	–0.012	0.00269	0.00781	0.0647***	0.04*	0.0447**	0.0157
	(0.0286)	(0.0753)	(0.0255)	(0.0228)	(0.0233)	(0.0222)	(0.0298)
F–Statistic	4.73***	6.68***	12.72***	7.99***	15.65***	278.17***	61.21***
Sargan test	6.54	4.79*	23.06*	34.47**	27.07**	71.38*	25.65**
Serial correlation test	–2.2**	–1.01	–1.68**	–2.17**	–2.35***	–2.43***	–2.06**
No. of banks	12 166	12 166	12 166	12 166	12 166	12 166	12 166
No. of observations							

Notes: This table presents the results of one-step system GMM estimation for the available sample of twelve Tunisian banks over the 1990–2007 period. The dependent variable is Loans expressed in differences of logarithms. The nature of GMM method leads to introduction of lagged dependent variable (Loans(-1)). The monetary policy instrument is measured through TB rate expressed in differences. Beside the instantaneous effect (variable ΔMP), a lagged effect is taken into account through introduction of lagged variable ΔMP(-1). For other notes see Table 6.1.

Source: Authors' estimates.

to changes in policy. In sum, the distributional effects (the significant non-linear relationship between size and loan growth) as well as the linear effects of size point to the existence of a bank lending channel in Tunisia.

Finally, the long-term elasticity of loans to real GDP growth is always positive and statistically significant, as expected in all the specifications. However, the response of loans to inflation is non-significant, albeit positive. This finding could be explained by the fact that Tunisia witnessed a period of high inflation.

6.8 Conclusion

The bank lending channel view supposes that banks have a particular role in propagating monetary policy impulses. The two conditions for the existence of the bank lending channel are the ability of central banks to impact on the supply of bank loans and the dependence of borrowers on bank loans. For empirical investigation of the bank lending channel in MENA countries, we use the approach that builds on the standard panel regression. The evidence on the bank lending channel is obtained by estimating a bank loan function that takes into account in the reaction of lending to monetary policy actions not only the monetary policy indicator and macroeconomic variables, but also bank-specific differences such as size, liquidity and capitalisation. The main question is whether there are certain types of bank that show a relatively strong decrease in lending after monetary tightening.

The chapter's findings turn out to be heterogeneous among MENA countries. For Jordan the results seem to be consistent with the first hypothesis, that is, lending by banks with a relatively weak capital base reacts more to a change in monetary policy stance than lending by better capitalised banks; likewise, size plays a significant role in shaping the response of Jordanian banks to monetary policy changes. Size was also revealed to be a bank characteristic that significantly affects the way Tunisian banks react to monetary policy changes. For Morocco, only liquidity appears to play a role in this context. These findings constitute strong evidence of the existence of a bank lending channel in these countries.

As for Egypt, the evidence for the existence of the bank lending channel is rather weak; liquidity and size do not exhibit any significant role, while capitalisation, although significant, affects the response of the banks to monetary policy change in a rather unusual manner. Well capitalised banks seem to respond more strongly to monetary policy than

less capitalised ones. In theory, undercapitalised banks should be more affected by monetary policy. One explanation that may be put forward in this context is that well capitalised banks could be less liquid. In all cases, the evidence for the existence of a bank lending channel in Egypt is rather weak, and more analysis should be done to reach a clear-cut conclusion.

The results of the paper could be useful to policymakers in MENA countries. First, if banks' capital is depleted, the lending channel will be weaker. In this case, it would be fruitless to adopt a traditional expansionary monetary policy, which would also bring about inflationary pressure without boosting real activity. A more rational and effective policy would consist in injecting capital into the banking sector in order to help it to stand on its own feet. Second, analyses of the feasibility of monetary integration should take an interest in the study of differences in the 'bank lending channel' between potential union countries. Heterogeneity in the structure of financial intermediation and in the degree and composition of firms' and households' debt could point to differences in the effectiveness of the monetary transmission mechanisms in the area of the potential union. If countries aiming to make up the union have asymmetric bank lending channels, an active monetary policy that responds to information from financial indicators will be beneficial. The optimal monetary policy is therefore influenced not only by the magnitude of the variance of the shock but also by its point of origin; its propagation within the union depends therefore upon the characteristics of the country that has been hit by the disturbance.

Notes

1. See, for instance, Peek and Rosengren (1995).
2. The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic and Slovenia.
3. x_i stands for either a single bank characteristic or a set of characteristics.
4. The total effect of the monetary policy on loans is computed as $(\alpha_0+\alpha_1)/(1-\delta_1)$.
5. The long-run coefficient of a variable is computed as the sum of its coefficients (of its lags and current values, where applicable) divided by one minus the sum of the coefficients of the lags of the dependent variable.

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Part II
The Journey towards IT

7

From Bretton Woods to Inflation Targeting: Financial Change and Monetary Policy Evolution in Europe

David Cobham

7.1 Introduction

At a time when developing and emerging countries are becoming more interested in adopting formal inflation targets, it may be useful to review the experience of developed countries, which have employed a variety of monetary frameworks on their journey from fixed exchange rates under the Bretton Woods system in the 1960s to formal or informal inflation targeting (IT) in the 2000s. While the financial and monetary systems of the US, the UK and Germany have long been highly developed on a number of dimensions, those of France and Italy were much closer even in the 1970s to those found in emerging and developing countries today, and had to undergo major transformations in line with the evolution of their monetary policy strategies. Their cases may therefore be of particular relevance to developing and emerging countries that are now moving in the same direction, and perhaps in particular to MENA countries whose pre-existing financial arrangements had much in common with French, and to a lesser extent Italian, financial mechanisms. This chapter charts the journey the developed countries have taken, with special reference to the financial infrastructure requirements – notably with respect to money and bond markets, and to central banks – and the changes in financial infrastructure in France and Italy that accompanied and underpinned the changes in their monetary policy strategies.

Section 7.2 sets out briefly a classification of 'monetary architectures', on which the paper draws. Section 7.3 considers developed countries' adoption of and experience with monetary targets from the 1970s. Section 7.4 assesses the monetary architecture of the main Anglo-Saxon and European developed countries, with respect to money and

bond markets, and how that architecture was transformed in France and Italy, in particular, in the 1980s. Section 7.5 evaluates the use of exchange rate targeting within the European Monetary System (EMS) in the 1980s and 1990s. Section 7.6 discusses the changes in monetary architecture with respect to central bank independence in the 1990s, again with emphasis on France and Italy. Section 7.7 looks explicitly at IT. Section 7.8 considers the issues raised for IT by the current financial crisis. Section 7.9 concludes.

7.2 Analytical framework

It is convenient to distinguish between three types of monetary architecture, based on the financial infrastructure required and the monetary policy strategies that are then possible.[1]

At one end of a continuous spectrum we can define a 'basic' monetary architecture, in which there are few or no banks and no organised financial markets, and the monetary authority has only minimal expertise. In such a monetary architecture all the monetary authority can do is to buy and sell foreign for domestic currency, that is, to operate a fixed exchange rate, which functions as a *substitute* for a monetary policy. This is the sort of architecture found in many former colonies in their immediate post-independence periods, and in some countries that were never formal colonies, such as the small Gulf countries in the 1950s and 1960s.

At the other end of the spectrum is what can be called a 'modern' monetary architecture, in which the banking system is large and well established, there are substantial organised markets in bonds and money, and the central bank has a high level both of independence from political pressure and of technical expertise. Here the money market, in which the commercial banks are continuously lending and borrowing to and from each other as well as the central bank, acts to transmit changes in the central bank's policy interest-rate fully and directly to the interest rates set by the commercial banks. Monetary growth is insulated from fiscal deficits (except perhaps those which are extraordinarily large) by the existence of a bond market, which enables the government to borrow from the non-bank private sector instead of the banking system. The central bank is therefore able to operate an interest rate-based policy on a continuous discretionary basis, and it can pursue a formal or informal inflation target, or even an exchange rate target (for which its main instrument would be the interest rate rather than foreign exchange market interventions).[2] Countries with

this type of architecture include the US, the euro area countries and the UK.

It is also useful to define an average 'intermediate' type of monetary architecture, between these two ends of the continuous spectrum, in which there is a substantial banking system and some kind of bond market, though no real money market, and the central bank has some ability to formulate and implement monetary policy. However, the lack of an active money market means that the central bank's policy rate is not transmitted fully or immediately through to the commercial banks' operations,[3] so that monetary policy has to be implemented mainly through other instruments, such as reserve requirements and credit controls. The bond market is not sufficiently active, or the involvement of the non-bank private sector substantial enough, for monetary growth to be securely insulated from fiscal deficits. The central bank can pursue monetary targets or exchange rate targets (mainly through foreign exchange market interventions rather than interest-rate changes), but it does not have the instruments or the technical expertise to operate an interest rate-based policy such as IT on a continuous discretionary basis; it also has little independence from the government.

7.3 From Bretton Woods to monetary targets

The fixed exchange rate international monetary system agreed at Bretton Woods in 1944, and implemented gradually after the Second World War, provided part of the context for the 'long boom' in the developed countries: two decades of more or less uninterrupted growth and low unemployment, with relatively low inflation. The nominal anchor for the system was provided by the US dollar (USD), to which other currencies pegged and which itself was in principle pegged to gold (that is, the price of gold was pegged in dollars). By the late 1960s, however, there were growing tensions between the US and Europe over the asymmetry of the arrangements (the US was able, indeed required, to run balance of payments deficits to provide international liquidity, while the European countries could not maintain long-term deficits), and the US was involved in an increasingly expensive foreign war (in Vietnam) in which its European allies had declined to participate. These tensions were partly responsible for the worldwide monetary expansion of 1971–2, which led to rising inflation, booms in commodity prices, notably oil, and the breakdown of the fixed exchange rate arrangements: by early 1973 the major currencies were all floating against one another. At this point, countries reacted differently to the threat of

inflation (which was compounded by the first oil price shock in late 1973, itself associated with the OPEC countries' successful long-term struggle to get control of the oil price, and with the Arab–Israeli war of October 1973). In Germany, for example, the independent Bundesbank chose to tighten monetary policy quickly and severely, while France, Italy and the UK (and to a lesser extent the US) chose to tackle the inflation in a more gradualist way, that is, they allowed it to rise above single figures before they took strong measures to bring it down.

It was in this context that monetary targets were first introduced, by Germany in 1974; the US, Switzerland, Canada and Italy (in the last case initially a total domestic credit target) in 1975; and by the UK, France and Australia in 1976. These were publicly announced targets for the growth of (initially broad but later in some cases narrow) measures of the money stock, usually for the coming year but later sometimes for periods of several years, typically expressed as target ranges rather than points. As Lane (1985) has argued, the introduction of such targets was not seen by central bankers as a move towards a Friedmanite monetary rule or as a pre-commitment within the time-inconsistency perspective (which was only just beginning to be developed); nor were they seen as commitments to precise short-term monetary control. So why were they introduced? The monetary authorities (including the politicians, since at this time most developed country central banks were not very independent) had realised that under high and variable inflation it was difficult to manipulate real interest rates; and they believed that pre-announced targets might stabilise the economic environment and so contribute to growth, but also that they might have some independent effect on inflation expectations and hence on the unemployment cost of disinflation. There was also a limited idea that targets would improve the credibility of official policies, as monetary authorities must be serious if they were willing to declare in advance a standard by which they could be assessed (see also Sumner, 1980). More broadly, the introduction of monetary targets should be regarded as a delayed response to the ending of the Bretton Woods system and as an attempt to provide an alternative nominal anchor to the dollar peg.[4]

The record of monetary targets is somewhat mixed. The period over which they were operated witnessed more or less successful disinflations in most of the developed countries, particularly after the second oil price shock of late 1979, to which countries responded in a much 'tougher' manner than the first. These disinflations were not without cost, however: all the developed countries (the European countries more than the US) experienced significant rises in the equilibrium rate

of unemployment or NAIRU in the 1970s and 1980s; and the high and variable interest rates associated with the 1979–82 'monetarist experiment' in the US contributed to the developing country debt crisis of 1982. Moreover, it is not clear how much monetary targeting itself contributed to these disinflations, since the targets were often missed – even the Bundesbank missed its targets around 50% of the time, while the UK, for example, experienced a number of very large overshoots (e.g. outturn growth of 19% against a target of 7–11% in 1980/1981). Targets can be missed for two reasons – either because the central bank's instruments are inadequate for it to attain its goals, or because the central bank changes its mind over the course of the target period and allows an overshoot (or undershoot). Academic observers have tended to focus on the first of these (notably with respect to the move towards monetary base control in the US in 1979[5]), but the big overshoots in the UK (and some Bundesbank misses) were of the latter type (for example, in the UK in 1980/1981 it became clear that the economy was already being squeezed tightly, partly as the result of an overshooting exchange rate appreciation, and that keeping to the monetary target would involve substantially more disinflationary pressure than the authorities had intended).

Monetary targets were downgraded and then abandoned in the Anglo-Saxon countries from the early 1980s: Canada ended its targets in 1982, Australia in 1985 and the UK over 1985–7; the US ended its M1 target in 1987 (it retained reference values for M2 and M3 until 2000). The basic rationale given was that the processes of innovation and structural change in the financial sector meant that the demand for money had become so unpredictable that precise control of the money stock was no longer feasible:[6] if there is no stable relationship between the money stock and the final objective (e.g. nominal income), then hitting the monetary target may mean not hitting the target for the final objective, and the monetary target will be neither a useful signal of the authorities' intentions nor a good benchmark for assessing performance. However, little hard evidence was adduced to support this argument and for the UK at least it seems that the velocity of money was no more unpredictable in the 1980s than it had been before,[7] so that if monetary targets were not justified in the mid-1980s they were not justified before that either.

A more important reason for the rejection of monetary targets may have been the growing conviction that the monetary authorities (given the financial liberalisation that had taken and/or was taking place) no longer had effective instruments to control the money supply: they

could intervene in the money and bond markets (which were well established in London and New York and developed elsewhere in the 1980s), but the effect of such interventions on the monetary aggregates was imprecise and variable. This was commonly understood in terms of the Keynesian–monetarist debate, in which Tobin (1963) had argued that money 'supply' was determined within the financial system via a complex set of interactions between banks and other agents, while Friedmanite monetary base control was not viable (see Goodhart, 1991; 1994). In the UK, monetary targeting had relied heavily on the technique of 'overfunding', in which the government sold more debt than its deficit in order to offset the effect on broad money of the high level of (liberalised) bank lending. However, this was abandoned in 1985 because of what were perceived as its increasingly distorting and/or cosmetic effects on financial flows.

7.4 Countries' monetary architecture and its evolution: money and bond markets

What types of monetary architecture existed in these countries in the 1970s? First, while the US, the UK and Germany already had large, well established bond markets, with substantial proportions of government debt held by the non-bank private sector, that was not true for France or Italy, where government paper was not traded actively and was typically held by public agencies (such as the postal system and the Caisse des Dépôts et Consignations in France), acting on the government's behalf to collect small savings, and by banks. Second, while the US, the UK and Germany[8] had active money markets, with interbank and CD markets developing from the 1960s or before, this was again not true for France or Italy, where treasury bills were the main or only money market instrument and secondary activity – particularly transactions between banks – was limited. Third, the central banks of France, Italy and even the UK were only just beginning to develop their expertise in economic research and monetary analysis by the start of the 1970s; and all of these were unequivocally subordinate at that time to their respective ministries of finance (see Section 7.5).[9]

Major financial changes in the form of liberalisation had been under way in the Anglo-Saxon economies (and to a lesser extent Germany) since the 1960s or even before, but in France and Italy change did not acquire any significant impetus until the 1980s. In Italy the central bank was obliged to buy unsold government debt until its so-called 'divorce' from the Treasury in 1981, but because the demand for government

debt remained weak and unstable, the central bank found itself repeatedly intervening after the divorce. However, it was the reforms of 1988–9 that were decisive. These applied to public debt management, the issuance of government paper, the secondary market for government paper, the money market and the settlement system, and capital controls (Passacantando, 1996). In particular, the Treasury ceased to set a floor price for its auctions, settlement was dematerialised and longer maturities were introduced, a screen-based interbank deposit market was established, which significantly improved liquidity and activity in the money market, and capital controls were dismantled (Cobham et al., 2008; Passacantando, 1996). The results were that monetary growth was securely insulated from fiscal policy and it became possible to operate monetary policy through interest rates, which allowed the credit ceilings to be abolished (though they were temporarily reintroduced in 1986/1987). Until 1992 the main element of the monetary policy framework was the fixed exchange rate within the Exchange Rate Mechanism (ERM) of the EMS, but this was accompanied by a target for M2.[10] After Italy was suspended from the ERM in September 1992, the monetary target continued, together with an inflation target set by the government, which was also heavily involved in wage negotiations, but the central bank was able to pursue these targets by a largely interest-rate based policy. Italy rejoined the ERM in 1996 and succeeded in entering the European Monetary Union (EMU) from the start (Chiorazzo and Spaventa, 1999).

In France there was a major government-led process of financial innovation from 1984, which included a range of reforms to money and bond markets, as well as changes in the regulation of banks and measures to strengthen existing and create new capital markets.[11] In particular, a new 'money' market was set up, within which all types of economic agent could trade the new instruments, which included certificates of deposit issued by banks, commercial paper and negotiable treasury bills, with maturities up to seven years. The operations of this and the longer-term bond market were greatly facilitated by the development of different types of collective investment institutions, following the changes to their legal statutes in 1979 (*sociétés d'investissement à capital variable* and *fonds communs de placement*). At the same time the interbank market was restricted to banks and the central bank, and the Banque de France's monetary policy operations were henceforth concentrated here on the overnight interbank rate, a corridor for which was created by a lending facility (*pensions à sept jours*) on the one hand and a deposit facility (*appels d'offres*) on the other, with the Banque retaining

the ability to intervene directly in the market as well. These changes allowed the monetary authorities to terminate the system of credit controls (*encadrement du crédit*) that had been the primary instrument of monetary policy in the first decade of monetary targeting. Monetary policy was henceforth operated primarily through interest rates, with intermediate targets being specified for both the exchange rate target and a broad monetary aggregate (M3).[12]

In both these cases, therefore, the monetary architecture was transformed over the course of the 1980s from something close to the 'intermediate' type to something much closer to the full 'modern' architecture. The UK's monetary architecture was already somewhat beyond the 'intermediate' position in the 1970s, but it too experienced major improvements in activity and liquidity in both bond and money markets in the 1980s (having abandoned its exchange controls in 1979), and it dropped both the indirect credit controls used in the late 1970s and early 1980s (the so-called 'corset') and the technique of 'overfunding' that was fundamental to the operation of monetary targets up to 1985; thus it too moved further in the direction of the 'modern' monetary architecture. Germany underwent less change, partly because it already had substantial money and bond markets and had not used direct credit controls or capital controls.

7.5 Exchange rate targeting in continental Europe

While the Anglo-Saxon countries moved sharply away from monetary targeting, in most cases to a less explicit and more discretionary framework, in continental Europe many countries continued to operate monetary targets, notably Germany and Switzerland, where monetary targets were used as the framework for explaining monetary policy. Monetary targets worked relatively well, partly because they were set on the basis of explicit forecasts of nominal income growth and velocity; in the UK, by contrast, the setting of targets had always been dominated by political influences.[13] However, the drive towards deeper economic integration, together with the increasing practical difficulties for trade (and particularly for the Common Agricultural Policy) caused by exchange rate fluctuations, pushed countries towards exchange rate targeting.

The EMS, with its ERM, established in 1979, was a grid of bilateral parities between (formally equal) members but it has been widely seen as an arrangement by which other countries pegged to the Deutsche Mark in order to benefit from the anti-inflationary credibility of the Bundesbank. At first the EMS seemed to put only minimal constraints

on countries' room for manoeuvre. But after the major turn in French policy in 1983 (Sachs and Wyplosz, 1986), and even more after the Basle-Nyborg agreement in 1987, the ERM became more binding: between March 1979 and March 1983 there had been seven realignments; between April 1983 and January 1987 there were four, and between February 1987 and mid-1992 there were none. Furthermore, from 1983 onwards inflation rates began to decline and converge (Gros and Thygesen, 1998, chapter 3).

As already indicated, the ERM has been seen as an asymmetric exchange rate system, in which the other countries pegged their currencies to and 'imported credibility' from the larger economy of Germany (which also had the most independent and respected central bank). But it can also be interpreted as a 'shock absorber' mechanism that enabled member countries to coordinate their macroeconomic policy in response to shocks without an explicit framework for coordination (Fratianni and von Hagen, 1992; Gros and Thygesen, 1998, chapter 4). From the perspective of this paper, what is important is that the exchange rate commitments by the non-German countries, which initially coexisted with their established monetary targeting procedures, gradually came to constitute the most important element in their monetary frameworks and continued to be so until the inauguration of the single currency and the EMU in 1999.[14] Germany, on the other hand, continued to operate its monetary policy largely as it had done before, with monetary targets geared to domestic inflation control and foreign exchange market interventions, when they occurred, against the dollar rather than against the other ERM currencies (Gros and Thygesen, 1998, chapter 4).

The ERM suffered a major setback between early September 1992 and the end of July 1993, when there was a series of speculative crises. These were associated with growing tensions between countries over monetary policy, as the Bundesbank raised interest rates to counter what it perceived as the danger of inflation arising from the relaxation of German fiscal policy in response to German reunification in the summer of 1990.[15] The Italian lira and the British pound, which had joined less than two years before, were suspended from the ERM in September 1992 (the lira returned in 1996 but the pound has not), other ERM currencies were devalued over the next nine months (the Irish punt, the Spanish peseta – three times – and the Portuguese escudo – twice) and some Nordic currencies that had been pegging informally to the EMS also had to abandon their pegs. The series of crises reached a climax in late July 1993 with massive speculative attacks on the French franc, which were ultimately resisted only by a widening of the

margins within which ERM parities could fluctuate from 2.25% to 15% (on either side).

This should not be considered a breakdown of the EMS as such, because countries did not use more than a small part of the extra margin allowed, most currencies returned to their central parities within months of the crises, and most entered the EMU (whose attainment was an implicit goal of the EMS) at those central rates. In addition, it has been argued that the causes of the crises lay not in the nature or the design of the system but in specific decisions taken by the monetary authorities concerned.[16] On the other hand, the upheavals of 1992–3 can fairly be regarded as a failure of exchange rate targeting, since the announced existence of serious (i.e. constraining) margins is an essential element of exchange rate targeting.

More broadly, however, it is clear that there were so many Europe-specific factors involved that this European experience does not provide a clear basis for a general evaluation of exchange rate targeting as a possible strategy for emerging and developing economies.

7.6 Countries' monetary architecture and its evolution: central bank independence and expertise

Central bank independence (CBI) became a major issue in the academic literature and then in policy debates from the 1980s. Within the time-inconsistency literature CBI is sometimes depicted in terms of Rogoff's (1985) conservative central banker, who is more inflation-averse than society as a whole. But the recasting of that literature by Bean (1998) – in whose model the government is not pursuing the unattainable target of the Walrasian frictionless perfect equilibrium but just wants output to be higher for broadly electoral reasons – depicts the independent central bank as free from the electoral incentive that governments face. In Bean's model there is an inflation bias when policy is made by the government, but the bias is absent when policy is made by an independent central bank, that is, CBI itself solves the problem of time-inconsistency. This perspective is much closer to that in the wider policy debate, and makes more sense of the empirical evidence, which, broadly, finds that in developed countries higher CBI is associated with lower inflation but not with lower or more variable growth.[17,18]

Standard assessments of the independence of developed country central banks, such as in Grilli et al. (1991) and Cukierman et al. (1992), involve the construction of indices based on criteria such as the extent of government involvement in the formulation of monetary policy and

the setting of interest rates, the extent to which the central bank is obliged to lend to the government, and the way in which the central bank governor is appointed (and can be dismissed). Such assessments have typically found the highest levels of independence at the German Bundesbank, the Swiss National Bank and the Federal Reserve in the US. The central banks of France, Italy and the UK, on the other hand, were clearly subordinate to their respective ministries of finance and received much lower scores.

By the early 1990s CBI had become part of the standard package of recommendations for policy reform made by international institutions such as the IMF and the OECD, and many countries implemented major changes in that direction. For example, most of the transition economies injected a strong dose of CBI into their central bank statutes or even into their constitutions (Beblavý, 2007), and many emerging economies made similar changes. Developed countries also introduced a range of reforms in the 1990s. In the case of EU countries, change was encouraged by the approach of monetary union, which (as agreed in the Maastricht Treaty of 1992) countries could enter only if their central banks were essentially independent. But there was also a genuine intellectual shift over the 1980s and early 1990s towards increased understanding of the time-inconsistency problem and of the contribution of CBI to credibility in monetary policy. Moreover, the old 'liberal' tradition of sound finance with central banks protected from political interference had survived more strongly in continental Europe than in the Anglo-Saxon countries, and CBI can be interpreted as a modern formalisation of that tradition.

The French central bank acquired from 1994 the responsibility to formulate and implement monetary policy with the goal of price stability without reference to the government; it was no longer permitted to lend to the government and the senior appointment procedures were changed. The effect was that the Banque de France now looked, in independence terms, much like the Bundesbank. In Italy, the 1992–3 changes also gave the central bank responsibility for monetary policy and prohibited it from lending to the government, but its overall position remained less independent than the Bundesbank. In the UK the 'new monetary policy framework' of 1993 (including the incorporation of elements of the Maastricht Treaty that affected lending to the government) and the 1997 allocation to the Bank of England of responsibility for interest-rate decisions (although the inflation target continued to be set by the government) also resulted in large rises in the CBI indices, though their levels remained below those of Italy and France.[19] One area where these and

other developed country central banks sometimes failed to score well on the indices is that of banking supervision. (The Grilli et al. indices give points for banking supervision not being the responsibility of the central bank.) But the importance of this issue is unclear (Goodhart and Schoenmaker, 1995), and central bankers themselves thought it unimportant (Beblavý, 2003; Masciandaro and Spinelli, 1994).

There remains considerable debate about the calculation of these indices (Mangano, 1998) and about the direction of causation. For example, it has been argued that German inflation has been low not because the Bundesbank has been independent, but because there has been a social consensus in favour of price stability that has causally affected both inflation and the independence of the Bundesbank.[20] It is also true that the major disinflations in Europe typically preceded rather than followed the increases in CBI. One possible explanation for this is that some central banks may have acquired a great deal of 'informal' or de facto independence well before they attained formal independence (Cobham et al., 2008).[21] On the other hand, there is clear evidence that CBI 'matters', for example in the French experience, where the statutory independence of the Banque de France was followed in 1995 by a period of sharp pressure from the government, which was successfully resisted by the Banque (Elgie and Thompson, 1998: 139–40).

It is common to associate the growth of central banks' independence with the rise in their 'transparency', that is, their provision of information about past and current decisions and their publication of their forecasts for inflation and GDP growth.[22] It is certainly true that much more information is made available by central banks now than in the 1950s or 1960s. However, it is important to emphasise not just the communication of analysis and forecasts but the ability to make them in the first place. There are no good data on the number of economists employed in central banks, but there can be no question that that number has increased enormously.[23] Moreover, while as late as the 1970s academic monetary economists tended to look down on economists who worked in central banks as old-fashioned and out of touch with modern economics, by the late 1990s central banks were recruiting and making use of economists who were operating at the frontiers of research in monetary and macroeconomics, and academics came increasingly to learn from and work with them.

The ECB, which has set monetary policy for the euro area since 1999, was deliberately established with complete independence. It is also very strong in terms of technical expertise, employing a large number of economists, and publishing a wide range of regular and occasional

monetary and financial reports and around 150 discussion papers per annum. The ECB has been accused by some (e.g. Geraats, 2010) of lacking full transparency compared with the Federal Reserve or the Bank of England, but it is possible to take a more favourable view of its transparency (Smets, 2010).

7.7 Inflation targeting

The first country to introduce a formal inflation target was New Zealand in 1990, but it was quickly followed by Canada in 1991, the UK in 1992, Sweden, Finland, and Australia in 1993, and a range of others thereafter (see Roger, 2010). The introduction of IT typically followed the failure of the previous monetary policy framework. For example, the UK, Sweden and Finland adopted IT after the collapse of their fixed exchange rates, while Canada, New Zealand and Australia took to IT after periods of discretionary policy (with no clear monetary framework) which were perceived as inefficient and themselves followed the abandonment of monetary targets.

The current monetary policy strategies of the Federal Reserve and the ECB involve an emphasis on price stability, and some observers classify these countries as informal inflation targeters. Others take the view that IT requires the public announcement of a specific target.[24] An analytical distinction is also commonly made between strict and flexible IT, where the latter but not the former involves a concern with the variability of output as well as with inflation. All known inflation targeters are flexible rather than strict.

The official reasons given in the formal IT countries for the adoption of IT included the need for a nominal anchor and the failure of other anchors (monetary or exchange rate targets) and the need for a framework for the accountability of the central bank (which often became more independent at the same time) It was also argued that an inflation target provides a clear benchmark and operates as a pre-commitment in the time-inconsistency sense. It should be noted that the developed countries that opted for formal IT were typically smaller Anglo-Saxon or Scandinavian countries from outside the continental European tradition of sound finance referred to above; they were also countries which had experienced problems of poor monetary policy and weak credibility, countries that were 'institutionally challenged' in Orphanides's (2010) felicitous phrase.

Evaluations of the performance of IT are somewhat mixed. The majority view[25] is that inflation targeting has worked well, in terms of

keeping inflation low without high output/unemployment variability; and there has been a welcome related improvement in accountability and transparency. In addition, no country that has adopted IT has so far abandoned it (except to enter the EMU), and there is some evidence that inflation targeters coped better with the commodity price rises and financial crisis of 2006–9 than non-IT countries.[26] However, the environment for monetary policy was much easier in the period from 1990 to mid-2007, and much of the improvement in inflation performance may reflect that. All developed countries – informal as well as formal inflation targeters – have lower inflation in the 1990s and the 2000s than in the 1980s or 1970s, and most developing countries had lower inflation in the 2000s than in the 1990s or 1980s. More specifically, while a number of observers have found that the formal adoption of IT tends to lower inflation, some have argued that when proper allowance is made for other factors (e.g. history) the contribution of IT itself is negligible.[27]

The current majority view also favours the adoption of IT by emerging economies. Roger and Stone (2005), for example, view the performance of emerging inflation targeters as generally successful, though they note that emerging countries typically take longer than industrial countries to get their inflation down to the ultimate target level, that their inflation under stable inflation targets is more volatile than that of industrial countries and that large target misses have typically been associated with exchange rate shocks.[28] However, it is recognised that many emerging country inflation targeters still pay significant attention to (and manage) their exchange rates, and for good reasons: typically their exchange rates are liable to high volatility, and they have high exchange rate–prices pass-throughs (Stone et al., 2009).

7.8 Inflation targeting and the financial crisis

As mentioned above, there is evidence that IT countries as a whole have done relatively well during the financial crisis that started in 2007 (see also Carvalho Filho, 2010; Olafsson and Pétursson, 2011). On the other hand, the UK, the largest IT country, has had a particularly difficult time in the crisis. Moreover, emerging market inflation targeters (but not developed ones) have tended to intervene more strongly in the forex market during the crisis, and in that sense have retreated somewhat from fully fledged IT (Stone et al., 2009). However, more important issues here are whether IT (formal and informal) could have contributed to the occurrence of the crisis, and whether IT should now be modi-

fied in some way. There is widespread agreement that aspects of banks' behaviour and bank regulation were significant factors in the 2007–9 financial crisis, but the crisis has given fresh life to decade-long arguments about monetary policy and asset prices.

The relevant assets are equity, housing and foreign exchange, all of whose prices are historically volatile, with periodic large, long swings. The majority view, articulated by Bernanke and Gertler (1999, 2001) is that it is too difficult to identify asset price bubbles and too dangerous to prick them; instead policymakers should just pick up the pieces after/if a bubble bursts (see also Posen, 2006). On the other hand, a minority view expressed most clearly by Cecchetti et al. (2000) argues that policy should respond to incipient bubbles so as to limit their development, by 'leaning against the wind' (LATW) (i.e. raising interest rates when asset prices seem to be rising too fast, and lowering them when prices are falling too fast) (see also Wadhwani, 2008, and Roubini, 2006).

One way of putting the latter argument is this: inflation-targeting central bankers typically try to explain their own reaction functions to private agents, in order to keep inflation expectations 'nailed down',[29] and they should try to do the same with asset prices – in the hope that they could hold down expectations so that action would have to be taken only rarely. In fact, most central bankers in the 2000s did not attempt to exercise any comparable influence on asset price expectations. Indeed, the Bernanke and Gertler (1999) recommendation (followed in practice by Greenspan as head of the Federal Reserve) set a floor to asset price expectations, below which prices could not fall, but implied that prices could rise without limit (the so-called Greenspan put). Moreover, there is evidence to suggest that the bubble in US housing prices was identifiable when it was happening and would have been smaller if interest rates had been raised earlier (Taylor, 2009); and in that case, although – given the flaws in the financial regulatory system – the crisis might not have been avoided, it would have been less sharp and less deep.[30]

The conventional reply to this view, as presented in Allsopp (2010), is that one instrument can be used to pursue only one target and it is essential to have clarity about its assignment: the interest rate should be assigned exclusively to targeting inflation (in goods and services); otherwise, there is a danger of worse performance on inflation without any definite gain elsewhere.[31] However, Papademos (2009), the first major central banker to talk positively about 'leaning against the wind', has argued that the ECB's definition of price stability as inflation close to but less than 2%, in conjunction presumably with its goal independence, would allow it to implement an LATW strategy if it wished; and

that the ECB's analysis of monetary and credit developments designed to identify longer-term inflation risks (the second 'pillar') should provide the appropriate signals of rising financial imbalances. Filardo and Genberg (2010) discuss explicitly the idea that a central bank could usefully have multiple objectives, which would also facilitate LATW where necessary.

7.9 Conclusions

The developed countries have tried between them a wide range of monetary policy frameworks. Over time, there is no doubt that both the framework and the operation of their monetary policy have improved enormously. Their experience provides a goldmine of examples and lessons for policymakers in the developing or emerging economies of the MENA region who are thinking of taking the same road. However, three warnings are in order.

First, different monetary policy strategies require different types of monetary architecture. Most obviously, a (formal or informal) IT strategy, in which the central bank operates through interest rates and makes decisions on interest rates on a continuous discretionary basis, can be implemented only in an economy where there are developed money and bond markets and by a central bank that has significant independence and a high level of professional expertise. As shown above, European countries had to undergo significant changes in their monetary architecture before they could move to formal or informal IT. But that means that MENA country policymakers considering a move towards IT also need to consider the transitional and long-term costs involved in setting up and operating these markets and transforming and running their central bank.

Second, it is worth noting that good policymakers can make a poor monetary framework perform adequately, while poor policymakers can sabotage a good framework. An example of the former might be the Bundesbank's operation of monetary targets, an example of the latter the problems in the ERM in 1992–3 stemming from government decisions. This point emphasises the importance of central bank expertise and independence with respect to policy decisions (and not just on the technical level), which cannot be acquired easily or instantaneously: MENA central banks need to appoint more, and better qualified, economists and other specialists.

Third, post-financial crisis (if not before), it should be clear that IT is not necessarily the end of the road for monetary policy strategies.

It may be a stage that some MENA countries – particularly those with poor records and/or heavy subordination of their central banks to their ministries of finance – have to pass through. In the longer term it may be both inevitable and desirable that central banks with established reputations will come to use their credibility to pursue slightly different objectives in different situations.

Notes

1. This distinction is set out at greater length in Cobham (2011), which uses it as a framework for analysing the positions of MENA countries.
2. It could also operate a monetary target, but there is no good reason why it would want to do so.
3. At least not by market forces alone: in some cases, the central bank may have sufficient administrative authority to ensure that commercial banks change their own rates in response to changes in policy rates.
4. In the UK this is particularly clear: monetary targets were first mentioned at the height of the prolonged sterling crisis of 1976 as a way of trying to calm the foreign exchange markets. Subsequently they were also seen as a way of deflecting attention from the unemployment consequences of disinflation (Fforde, 1983: 201–2).
5. See the summary of the discussion and references in Goodhart (1991: 295–6).
6. See, for example, the *locus classicus* for this argument in Bank of England (1986).
7. See Cobham (2002: 40–2), and Garratt et al. (2009).
8. See *Monthly Report of the Deutsche Bundesbank*, October 1980, pp. 26–32; March 1988, pp. 22–9; October 1996, pp. 31–42.
9. For general references on the 1970s and before see Holbik (1973) and Durand (1986).
10. According to Fratianni and Spinelli (1997: 244) the M2 target had taken priority over the domestic credit target from 1983 or 1984.
11. See Mélitz, 1990, and Banque de France, 1986: 20–1, 1987: 18–21, 1988: 22–31; Conseil national du crédit, 1987: 13–14.
12. Capital controls were also phased out in the second half of the 1980s.
13. See Cobham (2002: 47–8) on the UK and Cobham and Serre (1986) for some comparisons of monetary targeting between the UK and France.
14. Many of the EMS countries managed to go on operating monetary targets as well as the exchange rate targets implied by the EMS (for example, the Banque de France and the Banca d'Italia had monetary targets right up to 1998), and in so doing they defied the textbook wisdom that monetary and exchange rate targets are incompatible. That wisdom is correct if the targets are independent, but if they are set in relation to each other they may be compatible. In practice the exchange rate targets gradually came to take precedence, and by the late 1980s in any case these countries gave priority to exchange rate targets in cases of conflict.
15. See Cobham (2002, chapter 5) for a survey of the explanations of the crises.

16. Mélitz (1994) has articulated such a view with respect to France and the crisis of June–July 1993, while Cobham (2002, chapter 5) presents a related argument for the UK's exit from the ERM in September 1992.
17. See Berger et al. (2001) for a survey of this literature, and Laurens et al. (2009, chapter 6).
18. The evidence for developing countries is much less clear. The standard explanation for this is that the rule of law is weaker in developing countries, so that statutory independence is not a good measure of de facto independence, and Cukierman et al. (1992) and others have managed to retrieve the relationships between CBI and inflation/growth by using the turnover rate for central bank governors as an alternative measure of actual independence.
19. See Cobham et al. (2008) for an assessment of the changes to the formal CBI of France, Italy and the UK in the 1990s in terms of the Grilli et al. (1991) and Cukierman (1992) indices.
20. See, for example, Hayo (1998) and Posen (1993, 1998).
21. The outstanding example here is the Banca d'Italia, which acquired a position as both the best source of economic policy analysis and the most apolitical institution in Italy. This might constitute an interesting role model for central banks in some developing or emerging countries with weak governments.
22. See, for example, Geraats (2002).
23. Anecdotal estimates for the Bank of England would put the number of trained economists (with MScs and/or PhDs) employed there in the 1950s as below ten, and the number in the 2000s as closer to 100.
24. See, for example, Heikensten (2010) for the insistence on an explicit announcement, and Allsopp (2010) for a more inclusive view.
25. See, for example, Roger and Stone (2005), Roger (2010), Schmidt-Hebbel (2010) and Pétursson (2010).
26. See Roger (2010), but also Filardo and Genberg (2010).
27. See Ball and Sheridan (2005) and Filardo and Genberg (2010).
28. See also Roger (2010) and Schmidt-Hebbel (2010).
29. See, for example, Allsopp (2002).
30. See also Borio and White (2004), who suggest that changes in monetary policy, including formal and informal IT, together with changes in the financial structure, have made the financial system more 'elastic', that is, more vulnerable to boom and bust, to shocks and crisis.
31. See also Dale (2010).

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8

Monetary Policy in Turkey: The Reasons for Introducing IT and the Outcome

Hasan Ersel and Fatih Özatay

8.1 Introduction

Inflation targeting (IT) was introduced to Turkish practice as well as to its intellectual environment along with the measures taken after the 2001 crisis. The dramatic failure of the exchange rate-based monetary policy that was tried out in 2000–1 left Turkey in practice with only one untried option: IT. The Central Bank of the Republic of Turkey (CBT) switched to a fully fledged IT policy after a transition period, which was referred to, for convenience, as 'implicit IT'.[1] The CBT made it clear that whenever the necessary conditions were satisfied it would switch to fully fledged IT. On the other hand, the CBT revealed what it meant by 'necessary conditions' by underlining two major concerns. The first and more important concern was fiscal dominance: public debt was almost 75% of GDP,[2] a situation that had led to debt sustainability concerns, which reflected themselves in high spreads and real interest rates. The second concern was that the financial sector and non-financial corporations were severely affected by the crisis, and the resulting balance sheet problems were putting serious constraints on the efficient implementation of fully fledged IT. There were other challenges as well: high pass-through and backward-looking pricing. In addition, the CBT obviously needed some time to complete the necessary institutional arrangements for effective IT (such as its communication strategy).

The implicit IT regime, which was announced at the beginning of 2002, was quite successful in bringing down inflation without a sacrifice in output. This outcome, and the continuing remarkable fiscal discipline that brought the public-debt-to-GDP ratio down significantly, encouraged economic policymakers to switch to fully fledged IT at the

beginning of 2006. There were other factors reinforcing this decision: the record low level of default (Emerging Market Bond Index, EMBI) spreads and the Turkish government's decision to sign a new stand-by agreement with the International Monetary Fund (IMF) covering the period 2005–7. The last was considered as a powerful anchor for the successful implementation of fully fledged IT.

During the fully fledged targeting period (2006 onwards) the external conditions were rather unfavourable. There was a build-up of international financial stress in both 2006 and 2007, causing a temporary decline in the risk appetite of foreign investors. Crude oil prices registered record high levels. The effect of the sharp increase in world food prices on the domestic economy was also felt. There were negative factors of domestic origin as well: political tension increased during the 2007 presidential election, which was immediately followed by a general election. Some moves by economic policymakers caused concerns about the viability of the fiscal discipline that was at the core of the success so far and increased questions as to whether the essence of structural reforms was well understood by the politicians. Finally, throughout 2008 and 2009 the global financial crisis dramatically changed the economic conditions. This led first to significant pressure on exchange rates and interest rates, causing a jump in perceived risk. Uncertainty regarding the health of the global financial system increased severely. Then, a sharp decline in energy prices and domestic demand occurred. Such developments posed a great challenge for the conduct of monetary policy in general and IT in particular. As a result, the actual inflation rate remained well above the targets in the 2006–8 period and the CBT had to revise its targets in 2008. Thanks to the sharp decline in aggregate demand, goods prices and energy prices, the inflation target was (almost) met in 2009, for the first time during the IT period.

The aim of this paper is to evaluate the Turkish experience of fully fledged IT and draw some lessons from it. In Section 8.2 we briefly analyse the monetary policy of the 1980–2001 period. We then turn to the implicit IT period and discuss the necessary initial conditions for fully fledged IT in Section 8.3. The effectiveness of the short-term interest rate – the main tool of the CBT – is discussed in Section 8.4. Section 8.5 is devoted to the discussion of the working of the transmission channels in Turkey. The exchange rate policy is analysed in Section 8.6. Developments in the fully fledged IT period are presented in Section 8.7. Section 8.8 is devoted to remarks on reconsidering IT in the context of recent global developments and the role of exchange rate policy in IT.

8.2 Monetary policy before the implicit IT period

Successive Turkish governments pursued an inward-oriented growth strategy until the end of the 1970s. Turkey faced a deep balance of payments crisis in the second half of the 1970s. The inability of the existing system to deal with such a crisis induced the search for a better way to allocate resources. This search led Turkey to launch a structural adjustment programme in 1980, which aimed at increasing the role of the market mechanism in resource allocation. The financial liberalisation process was completed in 1989 by the liberalisation of the capital account. The 1990s and the start of the 21st century saw an intensification of macroeconomic imbalances. In fact, Turkey faced two crises, in 1994 and 2001. In this section we briefly discuss the conduct of monetary policy in the 1980–2001 period.

Liberalisation and monetary policy: 1980–9[3]

One of the important reform areas was the financial system. The period 1980–2 can be identified as the infancy of financial liberalisation, in which reformers concentrated on deregulating the financial system. It was naively thought that deregulation would be sufficient to create a competitive environment in the financial markets. However, these hopes were short lived due to the emergence of a financial crisis in 1982. In the second phase (1983–7), the reforms were more evenly distributed between deregulation and laying the institutional foundations for the smooth functioning of the financial system. The regulatory power of the monetary authorities was strengthened. The Banking Act of 1985 introduced provisions regarding the capital structure of banks, the protection of deposits, the treatment of non-performing loans and uniform accounting standards, and made the external auditing of banks obligatory from 1987. Efforts at structural reform weakened from 1988 onwards. Despite this weakening and the first signs of deterioration in the fiscal position of the government, the capital account of the balance of payments was liberalised in 1989.

Before the introduction of the auctioning of government securities in 1985, the public sector borrowing requirement was met either by tap issues of such securities or through CBT financing. Because of the latter, monetary policy was subordinate to fiscal policy. With the CBT obliged to finance public sector deficits and support selective credit schemes, monetary policy lacked adequate instruments for effective control of the liquidity in the system. A new liquidity and reserve requirement system was introduced in 1985 and 1986. Beginning in 1984, the scope

of the rediscount facilities had been gradually reduced. By a decision made in October 1989, the practice of using rediscount as a selective credit policy tool came to an end. These new institutional arrangements, coupled with the establishment of the interbank money market, made it feasible to start open market operations in 1987. That marked a significant change in the management of monetary policy, with a transition to a market-oriented monetary policy based on controlling the total reserves of the banking system.

Following these structural changes, the conduct of monetary policy became more complex due to the enhanced interrelations between various financial markets and the increase in capital movements resulting from the liberalisation of foreign exchange regulations. Further institutional arrangements were launched in 1989 to facilitate the implementation of a new approach to monetary policy. The most important of those arrangements was an accord signed in 1989 between the Treasury and the CBT. The accord imposed a ceiling on short-term advances to the Treasury, which are given at a much lower interest rate than the market rate. Furthermore, the Treasury accepted a second ceiling, which was much lower than the legal limit, for the automatic realisation of its demands to use advances from the CBT. This was an important step in limiting the credits given to the public sector. All these changes paved the way for the successful launching of the monetary programme in January 1990.

Turbulent times and monetary policy: 1990–2001

The CBT made a radical change in the conduct of monetary policy at the beginning of 1990 by announcing its monetary programme. This programme, unlike classical monetary targeting exercises, refrained from targeting any broad monetary aggregate; instead, it focused on reshaping the structure of the central bank's balance sheet. By doing so, the CBT aimed to reduce the rigidities in its balance sheet that inhibit the enhancement of the efficiency of monetary policy. The monetary programme had four quantitative targets chosen from the balance sheet of the CBT: the total size of the balance sheet, total domestic liabilities, total domestic assets, and central bank money (defined as the total Turkish lira liabilities of the CBT). The numerical targets were given in the form of upper and lower limits for each variable. Among the four targets, central bank money was given priority. The CBT succeeded in meeting the targets announced.

The CBT refrained from announcing a monetary programme for 1991, mainly because of the Gulf War but also because of increasing budget

deficits. In 1992, despite the lack of substantial corrective measures on the fiscal side, the CBT, albeit reluctantly, made the second programme public. In contrast to its earlier achievement, the CBT failed to adhere to its targets for the 1992 programme. In 1993, the CBT again avoided announcing a monetary programme due to increasing budget deficits.

At the beginning of 1994, due to a series of severe policy mistakes by the then ruling government, the Turkish economy went into a financial crisis, which, in turn, hit the real economy. The Turkish lira depreciated by almost 70%, overnight interest rates jumped to unprecedented levels, as high as 700% on occasion, from a stable pre-crisis level around 70%. The economy contracted by 6%. As discussed in detail in Özatay (2000), the monetary policy that the CBT was forced to implement played an important role in the outbreak of the 1994 crisis. Since the late 1980s, the main financing mechanism for the public deficit had been domestic debt. Consequently, the domestic-debt-to-GDP ratio followed an upward trend until 1994. However, at the end of 1993, policymakers gave clear signals to the market that they were willing to change the financing mechanism for the public deficit, rather than reducing the deficit itself. Short-maturity domestic debt auctions were cancelled in the second half of 1993 and the Treasury started to rely heavily upon CBT resources. It is argued in Özatay (2000) that, despite the weak fundamentals of the period preceding the crisis, in the absence of such policy mistakes the financial crisis could have been avoided. To end this crisis, the government signed a stand-by agreement with the IMF and this time the IMF put tight limits on the CBT's balance sheet.

The 1994–2000 period generally witnessed a rather lax fiscal policy. Monetary policy was mainly accommodative. In the absence of a stabilisation programme that aimed to put an end to this fiscal laxity, it was impossible for the monetary authorities to implement a disciplined monetary policy. Indeed, at that time, the main concern of the economic policymakers was to avoid the drying-up of the domestic debt market. Given the high and increasing financing requirement, a sharp decline in the demand for government securities would lead to monetisation. Hence, the CBT tried to leave enough liquidity in the market to minimise this risk and tried to prevent swings in the short-term lending rate. At the same time, in the absence of external shocks, the central bank aimed to keep the depreciation of the domestic currency parallel to the inflation rate.

At the end of 1999, Turkey attempted to change this picture and signed a stand-by agreement with the IMF. The resulting programme

addressed the macroeconomic imbalances and succeeded to some extent in reversing the negative trend. Presumably to break the inertia in the inflation rate, the policymakers put the pre-announced crawling peg system at the core of the programme. Relative to 1999, there was a sharp decline in both inflation and real interest rates as well as a significant increase in the primary surplus. Despite these positive developments, in the second half of November 2000 the first signs of a crisis were observed. At the end of December, average interest rates were almost four times higher than the levels at the beginning of November and more than five times higher than the pre-announced year-end depreciation rate of the Turkish lira. This unsustainable situation came to an end on 19 February 2001, when the prime minister announced that there was a severe political crisis, which ignited a corresponding economic crisis in the highly sensitive markets. On that date, overnight rates skyrocketed to 6,200%. Three days later the exchange rate system collapsed. The Turkish economy contracted in 2001 by 5.7% and the unemployment rate increased by 4.2 percentage points. Özatay and Sak (2002) argue that the fragile banking system and a number of triggering factors closely related to the banking sector were the main reasons behind this crisis.

Outcome: 1980–2001

The average inflation rate measured by the consumer price index (CPI), which was 24.1% in the 1970–9 period, increased to 52.6% in the next decade and to 74.2% in the 1990–2001 period. Moreover, the inflationary process became more persistent: the coefficients of variation of the inflation rate for these successive periods were 0.67, 0.53 and 0.25. Figure 8.1 shows the evolution of the consumer inflation rate over the period January 1970–July 2010. The first shaded area marks the liberalisation period (1980–9), while the second one indicates the implicit IT period.

The growth rate followed an opposite path. The mean rate of growth for 1970–9 was 4.7%. It declined to 4.1% in 1980–9 and 3.4% in 1990–2001. While the average growth rate declined, its volatility increased. The coefficient of variation, which was 0.68 in the first period, rose to 0.85 in the second period and 1.59 in the last period. The annual GDP growth rates of the 1970–2009 period are shown in Figure 8.2. As in Figure 8.1, the shaded areas denote the liberalisation and implicit IT periods. Table 8.1 provides the main economic indicators for the 1980–2009 period.

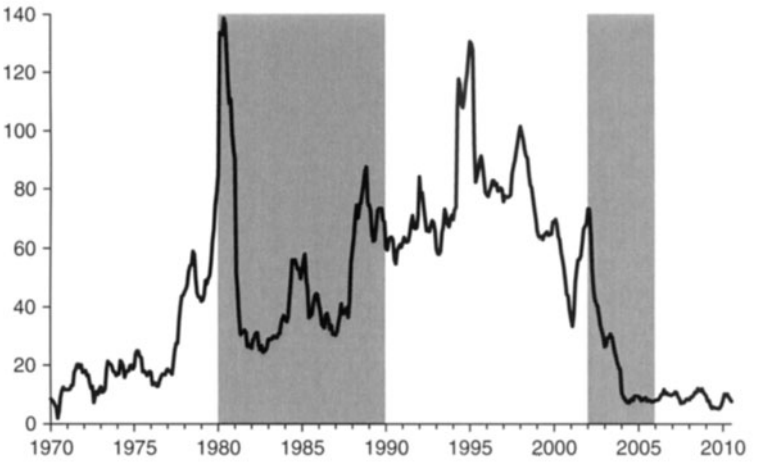

Figure 8.1 The consumer inflation rate (%, January 1970–July 2010)
Source: Turkish Statistics Institute.

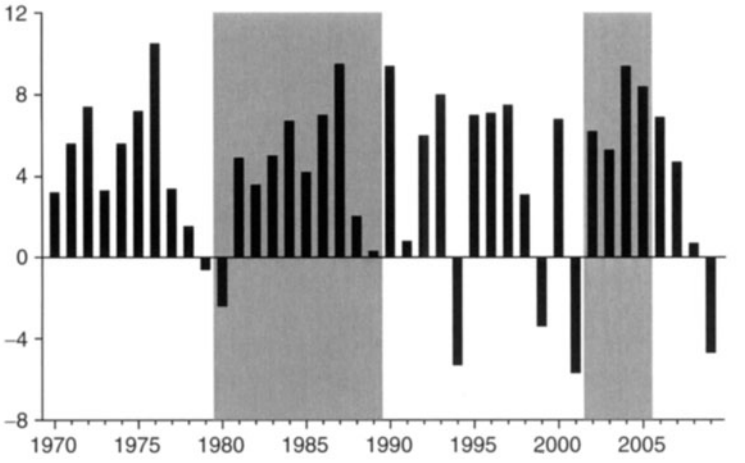

Figure 8.2 The GDP growth rate (%, 1970–2009)
Source: Turkish Statistics Institute.

8.3 Implicit IT and initial conditions for fully fledged IT: 2002–5

At the beginning of 2002 the CBT announced: '... there are two nominal anchors to be used in 2002 in order to lessen the future uncertainties and to influence the expectations. These anchors are monetary target-

Table 8.1 Main economic indicators (%)

	GDP growth rate	Year end CPI inflation rate	Current account balance/GDP	Government debt/GDP	Unemployment rate[a]
1980	−2.4	93.7	−3.3		
1985	4.2	44.2	−1.1	29.7	
1990	9.4	60.4	−1.3	25.2	
1995	7.0	76.0	−2.4	32.9	
2000	6.8	39.0	−3.7	38.2	
2001	−5.7	68.5	1.9	74.1	
2002	6.2	28.7	−0.3	69.2	
2003	5.3	18.4	−2.5	62.2	
2004	9.4	9.3	−3.7	56.6	10.8
2005	8.4	7.7	−4.6	51.1	10.6
2006	6.9	9.7	−6.1	45.5	10.2
2007	4.7	8.4	−5.9	39.6	10.3
2008	0.7	10.1	−5.7	40.0	11.0
2009	−4.7	6.5	−2.3	46.3	14.0

Note: [a] During the period covered in the table the definition of unemployment frequently changed. The new series that starts in 2004 is more reliable and sheds light on recent developments.

Source: Turkish Statistics Institute and Treasury.

ing and inflation targeting. In 2002, we will begin by monetary targeting and at the same time implement a monetary policy focused on the "future inflation", details of which are given below. In other words, this is "implicit inflation targeting". When the conditions are favourable we will openly switch to official inflation targeting.[4] Two questions follow: What was the reason for using two nominal anchors? Why implicit rather than fully fledged IT? Below we discuss these issues.

The need for two nominal anchors

The currency peg system that was introduced in 2000 collapsed in February 2001. It was unrealistic to insist on a similar regime in the aftermath of the crisis. Another option was to switch to monetary targeting. In fact, until Brazil's transition to IT under a stand-by agreement, limiting various monetary aggregates selected from the balance sheet of a central bank was a general rule under all stand-by agreements with the IMF. Turkey's was no exception. There were limits on

base money and the CBT's net domestic and net international assets for 2002.

However, the CBT was unhappy with monetary targeting, basically for two reasons. The first was the well known fact (which made monetary targeting an obsolete monetary policy regime) that there was a weakening link between classical monetary aggregates and inflation, due to financial innovations, free international capital flows and the insufficient capacity of the public to convert developments in monetary aggregates into inflation expectations. In addition, based on the strong programme that began to be implemented in May 2001 and a possible change in the mood of economic agents towards a more positive stance, a reversal in dollarisation was expected. However, this meant a rise in the demand for domestic currency. So it was difficult to forecast the demand for money and, consequently, there was a risk in frequently revising the targets for the monetary aggregates. The second reason was that there had been a similar agreement with the IMF before the crisis. Hence, there was a great risk that the public would not find monetary targeting credible.

A third option was to implement fully fledged IT. However, as we discuss in what follows, conditions for credibly implementing fully fledged IT did not exist. Hence, there was a dilemma. The monetary authorities were not happy with the monetary targeting regime. However, they were extremely reluctant to undertake a premature implementation of IT, which could undermine its credibility. These considerations led the authorities to institute a transitional regime, labelled 'implicit IT'. Such a transitional phase would allow the authorities both to consolidate their efforts on the public finance front and to strengthen the financial position of banks as well as non-financial companies. Such a period would also serve to downgrade monetary targeting, which had to be in the monetary policy framework due to the stand-by agreement with the IMF.

Why implicit rather than fully fledged IT?

The answer to this question was explicitly given by the CBT: 'We will openly initiate the inflation targeting regime whenever the conditions emerge. We had to postpone the introduction of inflation targeting due to concerns about the sustainability of domestic debt ... . There are two more factors why this regime has not yet been adopted. The first one is the deep-rooted habit of price setting based on past inflation ... . The second one is the still strong relationship between the inflation and the rate of exchange rate increase.'[5]

There are some conditions to be met before passing to an IT regime. Most important of these are the independence of the central bank,

a statement in its law regarding price stability as its main aim, the absence of fiscal dominance, a strong financial sector, a low exchange rate pass-through, and the absence of backward-looking pricing. In this section we analyse the Turkish economy in the period preceding fully fledged IT from these perspectives.

Central bank independence and its mandate

Central bank independence is obviously not only a legal issue. Unless other public and private bodies fully respect the concept of an independent central bank, it has no practical implication. In Turkey, central bank independence has a long history. When the CBT was established in 1931 as a joint stock company, the authorities were keen to constrain the voting powers of foreign banks and the government and therefore imposed legal upper limits for their capital shares. The former condition was the reflection of the huge problems that a foreign-owned de facto central bank (Ottoman Bank) created for the Ottoman Empire. The latter condition was, on the other hand, largely shared by central bankers in the post-First World War period in Europe. In 1971 the latter condition was reversed, and the Treasury was allowed to be the majority share holder. However, the CBT's independence became a public issue during the tenure of Governor Rüşdü Saracoglu (1987–93) and considerable progress was made in gaining popular support. Therefore, it will not be misleading to argue that the CBT has enjoyed considerable autonomy since then. However, the CBT law was left unchanged until the 2001 crisis.

The CBT law was amended on 25 April 2001. Since that date, the CBT has had instrument independence according to article 4: 'The primary objective of the Bank shall be to achieve and maintain price stability. The Bank shall determine at its own discretion the monetary policy that it shall implement and the monetary policy instruments that it is going to use in order to achieve and maintain price stability.'[6] There were other amendments as well. From the independence perspective the most important of them were the dismissal and appointment procedures of the governor and vice-governors and the prohibition on lending to the Treasury. Hence, from the legal perspective, the CBT was ready to implement fully fledged IT from May 2001.

Fiscal dominance

After the February 2001 crisis the public-debt-to-GDP ratio jumped from 38% (in 2000) to 74% (from 54% to 104% according to the publicly available GDP series of the time). As pointed out by Sargent and

Wallace (1981), when public debt is high and the real rate of return on government securities is in excess of the economy's growth rate, tightening monetary policy by reducing the growth rate of money can result in higher, rather than lower, inflation. Under these conditions, a contractionary monetary policy will initially lower seigniorage revenue and require that additional debt be issued; an increase in the deficit and the following rise in the stock of debt will eventually require an increase in seigniorage. This situation has been dubbed 'fiscal dominance of monetary policy'.

Why should an IT central bank be afraid of high public debt? The logic behind such a fear is as follows. An IT central bank should respond to an increase in the probability of an upsurge in inflation by raising its policy rate. If, in a highly indebted economy, the pass-through effect is significant, developments that increase concerns about debt sustainability would not only increase interest rates but also weaken the domestic currency. An increase in the probability of debt repudiation, on the one hand, would cause new subscribers to ask for higher rates to compensate for an increase in default risk. On the other hand, demand for foreign currency-denominated assets would increase; hence a weakening of the domestic currency would occur. Consequently, a central bank that raises its policy rate in response to a potential rise in inflation due to a weakening of the currency faces two related problems in these conditions. First, a rise in its overnight rate could signal to the markets that 'things are not going in the right direction', which could obviously increase the perceived default risk and, hence, the real interest rate and exchange rate. Second, both indirectly via the first effect and directly by raising the cost of borrowing, such a response in policy would increase the debt burden of the treasury and jeopardise debt sustainability. The domestic currency would depreciate in these circumstances, which is inflationary if the pass-through effect is significant. This means that the plan to increase the short-term interest rate to cope with inflationary pressures would backfire.[7]

Based on these considerations the CBT refrained from implementing fully fledged IT in the period 2002–5. However, thanks to strong fiscal performance, fiscal dominance gradually lost its importance through the stabilisation period. The fiscal discipline that Turkey exhibited during the 2001–6 period was both unexpected and, indeed, impressive. It was unexpected because in the recent history of Turkey, fiscal discipline was either lacking or, when it was attempted, short lived. In 2001, however, Turkey launched a detailed and strong medium-term programme to deal with the economic crisis and reduce public sector debt, and to

institutionalise fiscal discipline. At the beginning of 2006 the public-debt-to-GDP ratio was at 52.3% – 22.7 percentage points lower than its 2001 level: an impressive outcome (Table 8.2). How did this happen?

If the initial value of public debt is high and there are widespread concerns about the sustainability of the debt, a credible fiscal consolidation now minimises the risk of debt repudiation in the future. This immediately decreases the default premium, which leads to a significant decline in real interest rates. Moreover, the usual crowding-in channel is also effective in reducing interest rates. This is the credibility channel. Provided that the fiscal consolidation is perceived as permanent and regarded as credible, it signals an end to past lax policies. This means for economic agents that there is no more need for higher and distortionary taxation in the future, which brings about an increase in expected permanent income, which in turn raises the current level of private demand. This is the expectations channel. For the second channel in particular to be effective, the share of credit-constrained consumers among total consumers should be low.[8]

Table 8.2 Fiscal indicators, 2001–9 (% of GDP)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
General government balance (EU definition)	–24.5	–10.2	–9.0	–4.5	–0.6	1.2	–1.0	–22	na
Public sector borrowing requirement	12.1	10.0	7.3	3.6	–0.3	–2.0	0.1	1.6	6.4
Public sector gross debt stock (EU definition)	75.0	73.7	67.4	59.2	52.3	46.1	39.4	39.5	45.4
Central government									
balance	–11.9	–11.5	–8.8	–5.2	–1.1	–0.6	–1.6	–1.8	–5.5
primary balance	5.2	3.3	4.0	4.9	6.0	5.4	4.2	3.5	0.1
revenues	24.3	22.7	22.2	22.0	23.5	22.9	22.6	22.0	22.5
(tax revenues)	18.2	17.2	18.1	17.9	18.4	18.1	18.1	17.7	18.1
non-interest expenditures	19.1	19.4	18.2	17.1	17.6	17.4	18.4	18.5	22.4
iexpenditures	17.1	14.8	12.9	10.1	7.0	6.1	5.8	5.3	5.6

Source: Treasury.

Table 8.3 shows the evolution of various indicators of the credibility of the economic programme. Notice the decline in the real interest rate, the sovereign default rate (Emerging Market Bond Index Plus, EMBI+),[9] the lengthening of the maturity of borrowing of the Treasury, and the increase in business confidence, in the aftermath of the 2001 crisis. One should also see the real appreciation of the Turkish lira as partially reflecting the increased credibility of the programme. The policy of creating a considerable primary surplus and using the proceeds of privatisation to reduce public debt enhanced the credibility of economic policy, while leading to visible improvements in public sector performance. Özatay (2008) formally shows that both the credibility and expectations channels were operative in the post-crisis fiscal consolidation period. The government's unexpected, but strong and sincere, move towards EU membership, coupled with the privatisation, attracted foreign capital far beyond the country's previous experience

Table 8.3 Confidence measures

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Domestic debt real interest rate (%, year-end)[a]	na	na	22.4	14.6	10.6	9.9	10.2	6.2	2.7
Average maturity of borrowing (months)	4.9	9.4	11.6	14.8	27.7	28.0	34	31.7	36
EMEI Turkey spread (average, index)[b]	889	761	628	354	273	226	214	382	363
EMEI Turkey-EMBI global[c]	51	−14	66	−83	−43	26	24	−2	−90
Business confidence index (average)[d]	76.8	102.0	104.1	106.8	102.8	102.4	110.3	89	87.1
Real exchange rate index (average)[e]	112.5	125.3	136.5	143.5	160.0	160.6	175.9	180.2	167.1

Notes: [a] 'na' stands for 'not available'. [b] JP Morgan's emerging market bond index (Turkey's spread over the US Treasury bonds with identical maturity). [c] JP Morgan's emerging market bond index (global spread over the US Treasury bonds with identical maturity). [d] Due to the methodology change as of the beginning of 2007, 2001–6 and 2007–9 are not comparable. [e] An increase denotes real appreciation.

Source: Treasury, Central Bank of Turkey, Turkish Statistics Institute.

and reduced the cost of borrowing for both public and private sectors. The government faced almost no political difficulty in implementing such a programme, because during this period the rate of growth of the economy had also increased. It must, however, be admitted that the exceptionally favourable world economic environment played a significant role in enhancing the growth performance of the economy and helped the government to implement its programme.

One of the important reflections of these developments was a radical decline in the interest burden of the government budget. Table 8.2 shows that the ratio of interest payments to GDP was at an unbelievably high level at the end of 2001 – 17.1%. But it had declined to 7% by the end of 2005. Moreover, the post-crisis economic programme gave special importance to strengthening the banking sector, which initially caused a jump in the public-debt-to-GDP ratio. Such a move could not have been undertaken without the sustained and ambitious consolidation of the 2003–5 period. The fiscal consolidation and restructuring programme increased the capacity of the banking industry to expand its lending, which is discussed in the following section.

The strength of the financial sector

A major concern of a central bank that attempts to implement an IT programme is whether the country's banking system can properly and safely react to policy signals given by the central bank. If banks fail to react properly, they may curb the effectiveness of monetary policy.[10] On the other hand, if their reaction endangers the safety of the banking system, then the central bank will find itself in the position of placing financial stability ahead of price stability. Recent experiences of developing countries, as well as of Turkey itself, indicate that a liberalised financial system, unless supervised carefully and forcefully, may be vulnerable to crises. Banks in general tend to assume high risks, without increasing their capital base. Growth and employment concerns induce governments to overlook such tendencies and/or underestimate their dangers. Under such circumstances, central banks inevitably refrain from taking those decisions that may be effective in controlling inflation but may endanger financial stability. Obviously the solution to this problem lies in strengthening the supervisory environment, to enforce an effective risk management constraint on the banking system and increase bank capital.[11]

The negative balance sheet effect of the 2001 crisis was detrimental not only for banks but also for non-financial corporations. On 15 May 2001 Turkey launched the Banking Sector Restructuring Programme

(BSRP) to deal with the situation. The programme was, in fact, a component of the comprehensive restructuring programme of the Turkish economy. It therefore shared the general philosophy of inducing a change in the private sector by launching reforms in the public sector to change its mode of operation. The final aim of the BSRP was, therefore, to create a sound competitive environment for banking.

The programme was based on three pillars. The first pillar was the reform of state-owned banks. The programme aimed to solve the problem of the accumulated debt of the Treasury and to restructure these banks. Although this first pillar drew considerable attention due to its high cost and its attractiveness as a 'hot topic' in domestic politics, it was merely a stepping stone towards achieving the programme's final aim, that is, changing the mode of operation of private banks. Therefore, the second and more important pillar was strengthening private banks. The third pillar was establishing the conditions for a sound, functioning banking system by securing the autonomy of the supervisory authority, enhancing its technical capabilities and adopting international (notably EU) standards in banking legislation.

Both the declining importance of fiscal dominance, due to fiscal prudence, and the bank restructuring programme created the potential for banks to increase their credit lines to the corporate sector and households. The same economic environment simultaneously increased the demand for credit. Table 8.4 provides information regarding the financial depth, credit growth, and profitability of the banking sector in the period 2001–9. There was a sharp decrease in the non-performing loan rate from 2002 up to the global financial crisis. With the clean-up of the balance sheet of the banking sector, both total-assets-to-GDP and total-credit-to-GDP ratios declined in the aftermath of the 2001 crisis. However, especially from 2005, both ratios have since followed a significant upward trend.

Despite the positive developments in the Turkish banking system after its major restructuring in the early 2000s, financial stability remained a concern for the CBT. The recovery of the economy brought not only an opportunity for the banking system to grow but also fierce competition. Domestic banks found themselves competing for those customers who seemed eligible after the introduction of new risk management rules. It became clear that the number of commercial customers in need of financing is a binding constraint on banks' expansion of their activities and increases in their profitability. A glance at Turkey's balance of payments statistics reveals that, as the economy enters the growth phase of the cycle, such companies' ability to borrow from abroad dramatically

Table 8.4 Financial depth, credit growth and profitability of the banking sector

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Capital adequacy ratio	20.8	25.1	30.9	28.8	23.7	21.9	18.9	18.0	20.6
Non-performing loan rate	25.2	21.2	13.0	6.4	5.0	3.9	3.6	3.8	5.3
Total assets (% of GDP)	88.3	77.8	64.9	61.1	66.9	68.5	71.5	80.1	91.5
Total credit volume (% of GDP)	23.3	17.9	17.2	19.8	25.3	30.0	35.1	40.2	43.1
Total credit/ total assets	26.4	23.0	26.5	32.4	37.8	43.8	49.1	50.2	47.1
Profit/equity	−58.4	9.2	15.8	14	10.9	19.1	19.6	15.4	18.3
Profit/total assets	−5.7	1.1	2.2	2.1	1.5	2.3	2.6	1.8	2.4
Net interest income[a]/total assets	11.2	6.0	4.5	5.8	4.1	3.9	4.1	3.6	4.1

Note: [a] Until 2004 the numerator is 'net interest income'; after this date it is 'net interest income after specific provisions'.

Source: Central Bank of Turkey and Banks Association of Turkey.

increases and therefore their reliance on domestic financial institutions declines.[12] Such an increase in both domestic and external competition in banking exerted considerable downward pressure on bank profitability. The net-interest-income-to-total-assets ratio exhibited a declining trend during the years of economic recovery, and profitability declined (Table 8.4).

Exchange rate pass-through and backward-looking pricing

Exchange rate pass-through is the effect of exchange rate changes on inflation. It has two dimensions: magnitude and speed. By high exchange rate pass-through it is generally meant that one of the most important determinants of the future path of inflation is the rate of change of the exchange rate. This occurs first through the impact of import prices on costs, second through the effect on inflationary expectations and third via various indexation mechanisms.[13] In a small, open emerging economy, a significant change in the direction of capital flows that does not stem from the policies followed by that country has the potential to affect the exchange rate and hence the inflation rate.

Provided that such a shock persists for some time, inflation targets can be missed.

Kara and Öğünç (2008) show that after the crisis, with the implementation of the floating exchange rate regime, the exchange rate pass-through decreased in Turkey. First, while most of the pass-through was completed within five months in the period preceding the floating exchange rate regime, this duration was increased to twelve months under the float. Second, the total pass-through dropped to 30% during the float from a level of 60% in the pre-float period.[14] The findings of Kara et al. (2007) also point to a reduced pass-through. Note that, despite the sharp decline in the magnitude of the pass-through and the delayed response of inflation to changes in exchange rates after 2001, its level is still high. Başçı et al. (2007) point to the large share of the import component in total value added as the most important culprit for high pass-through.

Like high pass-through, the practice of indexation of nominal contracts to past inflation is one of the most important obstacles to the success of a monetary policy. The simple reason is that under such schemes one observes an important amount of inertia in the behaviour of inflation. Even in the absence of such formal indexation mechanisms, if economic agents consider past inflation data in taking economic decisions (i.e. they are backward looking), a similar inertia in inflation can arise. Kara et al. (2007) show that the impact of such implicit indexation mechanisms on the evolution of the inflation rate in Turkey in the period preceding the 2001 crisis was considerable. However, their findings indicate that with the introduction of the floating exchange rate regime the indexation behaviour weakened.

What is the right time?

The discussion so far shows that on the eve of the adoption of fully fledged IT only some of the conditions for fully fledged IT had been met. While fiscal dominance was not as strong as in the initial phase of the implicit IT regime, by the end of 2005 the public-debt-to-GDP ratio was still high. Similarly, despite the fact that the implicit IT period witnessed a strengthening of the financial sector and rapid credit growth to the private sector, there were still concerns about the risks and profitability of the banking sector at the beginning of 2006. One can make parallel arguments for the exchange rate pass-through and backward-looking pricing behaviour.

All these factors indicate that determining the 'right' time to put in place fully fledged IT is not an easy task. One should bear in mind that

being too perfectionist in this regard will be counterproductive, since there is never really a 'right time'. There will always be some missing elements, but one should seek a balance between the elements that are missing and those that are ready to use.

Outcome: 2002–5

The inflation rate declined sharply in the implicit IT period (Table 8.1). Moreover, it always remained below the targeted level (Table 8.6 below). While this deviation can be criticised as stemming from an excessively tight policy, it should be emphasised first that the GDP growth rates throughout the period were well above the potential growth rate of Turkey and second that the CBT tolerated this development in order to increase perceptions that the disinflation process would be persistent. One should note that this positive outcome – high growth and a sharp downward trend in inflation – could not have been achieved without the fiscal policy discipline and financial sector restructuring programme of the time.

8.4 Implementation of monetary policy and interest rate pass-through

How do lending and deposit rates and other medium- to long-term rates respond to changes in the short-term policy rate? This is an important question for an IT central bank. For its policy rate to influence aggregate demand, the interest rates that affect aggregate demand must follow the policy rate.

The CBT uses the so called 'corridor system' for the short-term rate that it sets. In this system, which is used by many IT central banks, the CBT (in fact the monetary policy committee) simultaneously announces the rate at which it accepts overnight deposits from the banks (the borrowing rate) and the rate at which it lends overnight to the banks (the lending rate). The borrowing rate sets the lower limit of the corridor and the lending rate is the upper limit of the corridor. In the short-term money market, banks lend to and borrow from each other according to their reserve position. It follows that the equilibrium market interest rate must remain in this corridor. The reason is simple: since the CBT is ready to accept deposits at its borrowing rate, no bank will lend to its counterparties below the borrowing rate of the CBT; similarly, as the CBT is ready to lend at its lending rate, no bank will borrow from another bank above the upper limit of the corridor. Figure 8.3 shows the evolution of both rates since July 2002.

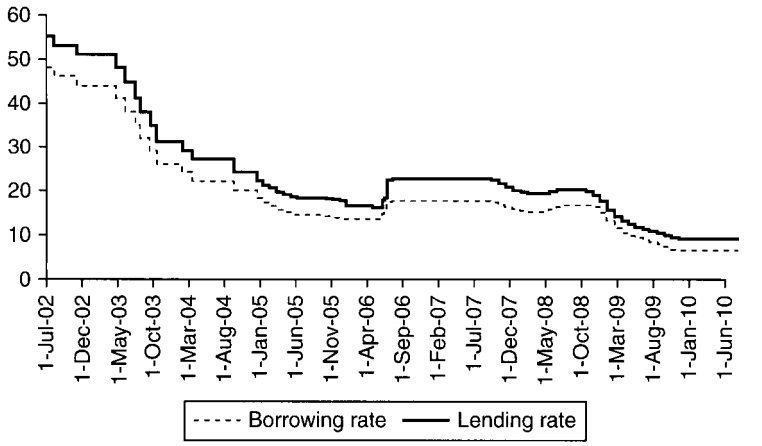

Figure 8.3 The corridor system of the CBT (%, 1 July 2002–30 July 2010)
Source: Central Bank of Turkey.

From the February 2001 crisis until the end of 2008, the CBT was always a net borrower from the money market. There are two underlying reasons for this. First, the restructuring of the banking sector, which had been one of the main victims of the February 2001 crisis, led to the creation of a sizable amount of excess liquidity in the market. Second, as of mid-December 2007, the cumulative net foreign exchange purchases of the CBT amounted to almost USD 54 billion. The CBT withdrew the excess liquidity in the market mainly via Turkish lira deposit operations in the interbank market within the CBT and repo (repurchase agreement) transactions in the repo and reverse repo market of the Istanbul Stock Exchange, on an overnight basis. Accordingly, overnight interest rates were constantly realised around the borrowing rate of the CBT. Hence, the borrowing rate of the CBT was the indicator for money markets.

However, especially from mid-2009 onwards, the situation changed and at the aggregate level the CBT became a net lender to the banking system. Since January 2010, the CBT has been announcing a weekly repo rate at which it is ready to purchase government securities via open market operations with a promise to sell back these securities a week later. The repo rate always lies in the corridor.

It is important to emphasise that the required reserve maintenance system, the liquidity supply system and the corridor system should be compatible with each other. These three make up the operational

framework of the central bank. We will not go into further details of the operational framework, but now turn to the evidence on the interaction of short-term policy rates with longer-term rates.

Using bank-level data, Aydın (2007) investigates the degree and the speed of adjustment of retail bank lending rates to the central bank policy rate for the period June 2001–September 2005. In his panel there are four types of loan (automobile, housing, cash and corporate) and twenty-five banks. He estimates both long-run and short-run equations. He finds that all types of loan rate are cointegrated with the policy rate, that is, they move together. The long-run pass-through for corporate loans is around 70%, whereas, especially in the second half of the period covered, automobile and cash loans adjust almost one-for-one to the policy rate. Evidence for the short-run pass-through is inconclusive.

What do these results tell us about the effectiveness of IT? They can be interpreted as showing the importance of monetary policy in determining the general trend of loan rates. However, with regard to day-to-day fluctuations, other factors are at work.

What about other interest rates? One important interest rate is the secondary market rate of the benchmark treasury bond. Using daily data, and controlling for domestic macroeconomic surprises and political news effects, Emir et al. (2007) show that for the period 2001–4 there was a positive association between the CBT policy rate and the benchmark secondary market rate. Estimation of a cointegrating relationship between the CBT rate and the benchmark rate over a longer time span tells a similar story. Figure 8.4 shows how these variables have a common trend. In fact, with daily data for the post-crisis period (2 January 2002–30 September 2009), a formal test indicates that these two variables are cointegrated.[15]

8.5 Which transmission channels are effective?

Monetary policy signals are transmitted through various channels. In this section the focus will be on the 'credit', 'exchange rate', and 'expectations and communication' channels.

The credit channel

In recent years there has been a significant credit expansion in Turkey. Consumers especially have enjoyed rapid consumer credit growth. The results of Özatay (2008) indicate that credit volume is an important determinant of private demand. He shows that in the period 1994–

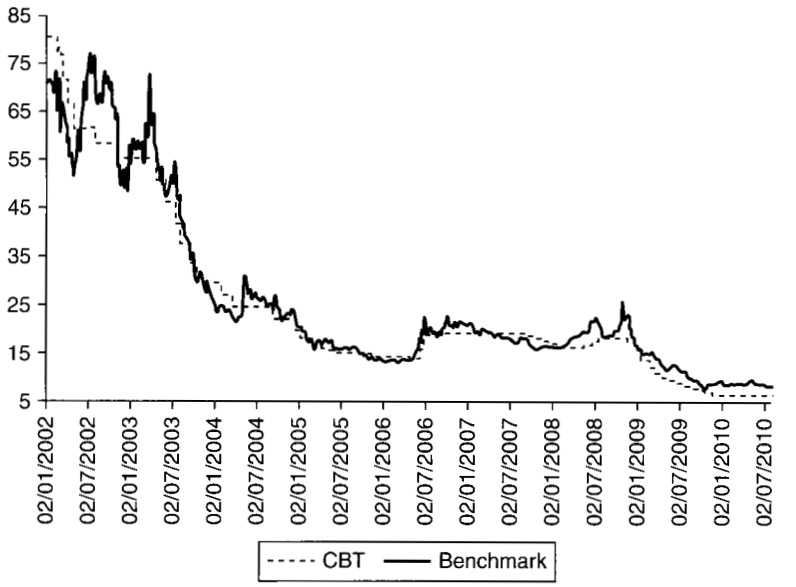

Figure 8.4 Central Bank of Turkey policy rate (CBT) and the secondary market benchmark bond rate (Benchmark) (%, 2 January 2002–30 July 2010)
Source: Central Bank of Turkey and Istanbul Stock Exchange.

2006, once fluctuations in disposable income are controlled for, there was a significant influence of consumer credit growth on Turkish consumption growth. Similarly, along with business confidence and real income, real credit to the corporate sector was an important determinant of private investment decisions.

However, it should also be taken into account that the Turkish private sector has some access to the global financial system and therefore is capable of substituting its domestic liabilities by external financing. Although such substitution is far from perfect, as emphasized in Section 8.3, it can become sufficiently strong during the growth phases of the cycles and undermines the efficiency of the credit channel.

In Table 8.5 we report the evolution of the liabilities of the non-banking corporate sector to the rest of the world. The long-term new-disbursements-to-GDP ratio increased to almost 7.4% in 2007. The global crisis manifested itself as a significant reversal in net foreign credit available to the non-banking private sector. Such rapid expansions and sudden stops of foreign credit are most unhelpful to the central bank in its conduct of monetary policy.

Table 8.5 Net claims of non-residents on the non-banking private sector[a] (% of GDP)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Long-term									
Disbursement	4.6	4.3	3.5	3.8	4.3	6.2	7.4	6.4	3.9
Repayment	−4.5	−3.8	−3.3	−2.5	−2.3	−2.7	−3.4	−3.3	−5.4
Net	0.1	0.5	0.2	1.2	2.0	3.5	4.0	3.1	−1.5
Short-term	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0
Total net	0.2	0.2	0.3	1.3	2.0	3.6	4.0	3.2	−1.5

Note: [a] Balance of payments table: financial accounts: other investment of other sectors.

Source: Central Bank of Turkey (www.tcmb.gov.tr).

In sum, despite the counteracting effect of globalisation, we can conclude that the fully fledged IT period witnessed a deepening in the credit market, which, to a certain degree, increased the effectiveness of the credit channel.

The exchange rate channel

From the beginning of 2002 until the beginning of fully fledged IT (January 2006), the CBT rarely intervened in the foreign exchange market. All its interventions were in the form of foreign exchange purchases, except one – an extremely low foreign exchange sale at the end of the Iraq war. Despite this fact, the Turkish lira appreciated in real terms in the same time period (Table 8.3).

What was the role of this appreciation in the post-2001 crisis growth performance? The most obvious consequence of appreciation is its negative impact on net exports. However, in highly dollarised countries it can also affect output through an entirely different mechanism. Kesriyeli et al. (2005) show that the liability dollarisation of Turkish corporate sector firms is extremely high. They use the share of debt denominated in foreign currency in total debt of the commercial sector as a proxy for liability dollarisation. This ratio, after reaching a record high level of almost 80% in 2000, declined to 72% at the end of 2003.[16] They also show that the budget deficit to GDP ratio and the real sector confidence index are among the most important determinants of corporate sector liability dollarisation. As fiscal irresponsibility increases and business confidence decreases, liability dollarisation increases. Another important finding is that the high level of exposure to exchange rate risk in low-export sectors dominates the partial

hedge in higher exporting sectors. In other words, they argue that, in the period analysed, real exchange rate appreciations are expansionary in terms of investments and profitability.

The findings of Kara et al. (2007) support this conclusion. They show that appreciation of the real exchange rate leads to an expansion in economic activity. Furthermore, Başçı et al. (2007) argue that appreciation phases coincide with solid expansion phases, through at least two channels: first, by increasing the net worth of firms with foreign-currency-denominated debts, and second, through the cost channel, by decreasing the production costs of firms and hence reducing prices and stimulating domestic demand.[17]

Hence, one should note that in highly dollarised economies the impact of exchange rate developments on the real economy can be significantly different from what the text book channels envisage. One should take the balance sheet effects into consideration.

The expectations and communication channel

The management of expectations is an integral part of IT. In order for this channel to be effective, first, the underlying macroeconomic framework should be strong. Second, monetary authorities should be able to convince the markets of the validity of their decisions. In this context, successful communication methods are necessary. If, as occurred in the past, there have been lax fiscal policies and monetary policy has been accommodative, it is very difficult to manage expectations so that they are in line with the inflation target. To gain credibility, inflation targeters of such countries should give clear messages to the markets, if necessary publicly criticise the government, publish press releases explaining what they intend to do, take no decision that they have not promised to take and refrain from taking controversial decisions if the markets are not likely to be receptive. Monetary authorities should understand that they can gain credibility only gradually.

To quantify their credibility to the markets they need a metric as well. Measuring inflation expectations frequently would help in this respect. Well aware of this fact, the CBT, even before it implemented implicit IT, started to conduct a bi-weekly expectations survey in August 2001. It is a focused and compact survey, whose questions are sent and answered by e-mail. Its results have broad coverage in the media, and central bank watchers pay particular attention to it. The CBT announced publicly that it was measuring its 'credibility gap' by the difference between the expected inflation and the targeted inflation. Expected end-year inflation rates as of the beginning of the year and realisations are given in Table 8.6.

Table 8.6 Expected and realised inflation rates

	2002	2003	2004	2005	2006	2007	2008	2009	2010
End-year inflation (%)									
Target	35	20	12	8	5	4	4	7.5	6.5
Expectation as of the beginning of year	48.3	24.9	13.1	8.4	5.7	7.1	6.5	7.8	6.9
Realisation[a]	29.7	18.4	9.3	7.7	9.6	8.4	10.1	6.5	7.5
Credibility gap: expectation – target	13.3	4.9	1.1	0.4	0.7	3.1	2.5	0.3	0.4
Deviation: realisation – target	−5.3	−1.6	−2.7	−0.3	4.6	4.4	6.1	−1.0	1.0
GDP growth rate[b] (%)	6.2	5.3	9.4	8.4	6.9	4.7	0.7	−4.7	5.8

Notes: [a] Figure of 2010 is the forecast of the Central Bank given in its third inflation report of 2010. [b] 2010 figure is the consensus forecast.

Source: Central Bank of Turkey and Turkish Statistics Association.

In the management of expectations, a transparent decision-making process is essential. The rule that the central bank follows in the decision-making process should clearly be understood by the public. By 'the rule', we mean a decision process in which an explicit model of the economy plays a central role, as stressed, for example, by Woodford (2003: 15–18). There are two essential elements in this process. The first is to explain the rationale behind the decisions that have already been taken. The most important means of communicating with the market regarding the decisions taken is *Inflation Reports*. But *Inflation Reports* should not only explain past decisions, they should be forward looking in the sense that they should provide inflation forecasts and either signal the path that is going to be followed by the policy rate or explicitly provide this path. This forward-looking function is the second essential element.

The CBT has been publishing such reports on a quarterly basis since the beginning of 2006. Its report is basically an analysis of the current and possible future developments in the economy and in international markets from the perspective of their impact on the future paths of inflation and the CBT's overnight rate. A notable feature of the CBT's and other IT central banks' *Inflation Reports* is that they are mainly forward looking.

In their recent paper, Başşkaya et al. (2008), using survey data, found support for the view that economic agents (i.e. survey respondents) take the inflation targets as well as the central bank's forecasts into account in forming their expectations. It is also reported that the sensitivity of inflation expectations to exchange rates and risk has started to increase in recent years. A second major finding of the paper is the different ways in which the financial and real sectors form their expectations. Decision makers in the real sector are more backward looking, whereas those in the financial sector are quite sensitive to short-term variations in the financial data. Finally, the authors point out that the May–June 2006 financial market turbulence had a significant impact on the way agents form their expectations: it led to an increase in the degree of backward-looking behaviour.

In Turkey, the CBT is by far the best qualified institution publishing inflation forecasts. These forecasts are taken into account by economic agents. On the other hand, it will not be unfair to say that most other forecasters in fact use the CBT's forecasts as a benchmark and simply adjust them according to their degree of optimism/pessimism. Obviously, being in such a privileged position strengthens the CBT's capacity to influence expectations. Occasionally, however, when the CBT's forecast errors are significant, it seems that the same position of privilege works against its conduct of monetary policy. In general such errors do not lead to a credibility loss for the CBT, such as might stem from the disappointment of economic agents. Their trust in the CBT persists, although their worries concerning the economic situation may be aggravated. In other words, economic agents treat such episodes as temporary states of uncertainty and/or instability. Such episodes therefore require extra effort on the part of the CBT to stabilise expectations.

8.6 The exchange rate regime and monetary policy

The pre-announced fixed rate of increase of the exchange rate system, which had been in place since January 2000, collapsed in February 2001. One of the most important elements of the programme that was implemented after the crisis was the floating exchange rate system. Both the monetary and exchange rate policies of the CBT were made more explicit at the beginning of 2002. At that time, the CBT once more emphasised the importance of the floating exchange rate system. The main principle since then has been that market conditions would determine exchange rates. That is, the CBT stressed that it would not

interfere in the level or trend of the exchange rate. It also announced that it could intervene in the event of excess volatility. Based on the main principle, however, the CBT has also pledged to keep the number of such volatility interventions strictly limited.

In addition, at the beginning of 2002, the CBT explicitly told the markets that:

1. conditional on strict implementation of the programme and in the absence of large external shocks, the dollarisation process would lose its importance, eventually leading to a reverse dollarisation process;
2. it was most likely that there would be favourable capital account developments;
3. although the exchange rate regime was an 'almost pure float', the level of foreign exchange reserves was important for at least three reasons. First, Turkey had debt repayments due shortly to the IMF. Second, international investors put a special emphasis on the level of reserves. Third, the CBT wanted to clear from its balance sheet some types of foreign exchange liabilities with high costs such as deposits of workers abroad;
4. given the importance of the level of reserves (in this case regardless of the exchange rate system), provided that at least one of the conditions stated in the first two paragraphs materialised, the CBT was going to build up reserves through rule-based, transparent and pre-announced purchase auctions. The important point to note is that these auctions, unlike volatility interventions, were not discretionary. They were rule-based, with rules which were known by the public. Provided that the aforementioned conditions were satisfied, at the beginning of each month, the CBT would announce how much foreign exchange it was going to buy in these daily auctions and via which mechanism. In later stages, the auction mechanism was revised: a yearly programme was announced to reduce to a minimum the distortionary effects on the operation of the foreign exchange market of possible changes in daily purchase amounts at the beginning of each month; and the CBT would not change the programme unless extraordinary changes were observed in terms of foreign exchange liquidity.

During the turbulence in the global financial markets in June 2006, October 2008 and March 2009, the CBT stopped buying foreign exchange from the market and instead sold foreign exchange via rule-based auctions. However, the life of these selling auctions was rather

short: two days in June 2006 and October 2008 and eighteen days in March 2009. The auctions were discontinued in order to ease pressure on the foreign exchange market.

We must emphasise that without the floating exchange rate regime, it would have been almost impossible for the CBT to implement both the implicit and the fully fledged IT regimes of the 2002–10 period. First, this gave the CBT the chance to concentrate only on price stability. Second, as the hectic experience of the global financial turmoil proved, a flexible exchange rate regime acts as a shock absorber.

8.7 The fully fledged IT period: January 2006–July 2010

Economic policymakers switched to fully fledged IT at the beginning of 2006. The inflation target was set (jointly with the government) as a point target.[18] The inflation rate as measured by the headline CPI was used to define the target (Table 8.6). The CBT explicitly stated that it would assess upward or downward deviations from the target on an equal footing.

According to the provision in article 42 of its law, the CBT has to submit information and the measures to be taken to the government in the event of deviations from the target. In order to activate such a mechanism, the CBT defined a symmetric 'uncertainty band' around the target. It emphasised that such a band should not be perceived as a band for the inflation target. This band was set as 2 percentage points in both directions. However, since the stand-by agreement with the IMF was continuing and such agreements need performance criteria for monetary policy, the CBT announced a quarterly inflation path consistent with the target and consequently set uncertainty bands for the end of each quarter.

It was also emphasised that monetary policy would not instantly react to the temporary impacts of large exogenous shocks on inflation. Note that inflation targets for a three-year period were announced at the outset. Hence, there was a medium-term perspective for the IT regime, which gave some flexibility to the CBT to tolerate the short-term effects of such exogenous shocks provided that the medium-term target was not in jeopardy.

The CBT stated that a pre-announced target would be changed only when very sharp and long-term deviations from the target were expected or medium-term targets no longer made sense due to factors beyond the control of monetary policy. However, temporary shocks could change inflation forecasts rather than inflation targets.

2006–7

Two major problems marked this period. First, despite a slowdown, inflation remained well above the targeted rates and the world average. That led to some erosion of the CBT's credibility. One should note that during the fully fledged targeting period the external conditions were unfavourable: there was a build-up of international financial stress both in 2006 and in 2007, which caused a temporary decline in the risk appetite of foreign investors. Various factors (such as increased food demand, reallocation of agricultural land in favour of bio-fuel production, and global warming) contributed to sharp increases in world food prices, whereas crude oil prices registered record high levels. There were domestically originated negative factors as well: political tension increased during the 2007 presidential election, which was immediately followed by a general election (July 2007). Some moves by economic policymakers caused concerns about the viability of the fiscal discipline that was at the core of the success so far and increased doubts over whether the essence of the structural reforms was well understood by the politicians. The second problem was the continuation of the appreciation of the Turkish lira, which led to an increase in pressure on the CBT to take action to halt this development.

The end-year inflation rate in 2006 was almost twice the target. This bad performance led to a deterioration in inflation expectations and the credibility gap (using the measure defined above) started to increase. At the beginning of 2007, while the end-year target was 4%, the credibility gap was 3.1 percentage points. The performance in 2007 was no different from that of the preceding year; the target was missed from above by a rather large margin (Table 8.6). The CBT responded by starting a tightening cycle, which ended in September 2007 with a new easing cycle (Table 8.7).

2008–July 2010

The easing cycle did not last long. High energy prices on the one hand and the unfavourable impact of the global crisis on the other hand forced the CBT to tighten again in June 2008 (Table 8.7). This was not the only negative development; the CBT also faced a rather disappointing development at the political level. The new government that came to power after the 2007 elections failed to give the much-required support to the CBT's anti-inflationary policies. Although the government never explicitly abandoned the rhetoric of supporting the CBT in its efforts to fight inflation, various ministers frequently found excuses to complain openly about the CBT's policies (notably in the contexts

Table 8.7 Overnight (ON) borrowing rates of the Central Bank of Turkey (%, simple)

	ON rate (%)		ON rate (%)
9 December 2005–27 April 2006	13.50	20 November 2008–18 December 2008	16.25
28 April 2006–7 June 2006	13.25	19 December 2008–15 January 2009	15.00
8 June 2006–25 June 2006	15.00	16 January 2009–19 February 2009	13.00
26 June 2006–20 July 2006	17.25	20 February 2009–19 March 2009	11.50
21 July 2006–13 September 2007	17.50	20 March 2009–16 April 2009	10.50
14 September 2007–16 October 2007	17.25	17 April 2009–14 May 2009	9.75
17 October 2007–14 November 2007	16.75	15 May 2009–16 June 2009	9.25
15 November 2007–13 December 2007	16.25	17 June 2009–16 July 2009	8.75
14 December 2007–17 January 2008	15.75	17 July 2009–18 August 2009	8.25
18 January 2008–14 February 2008	15.50	19 August 2009–17 September 2009	7.75
15 February 2008–15 May 2008	15.25	18 September 2009–15 October 2009	7.25
16 May 2008–16 June 2008	15.75	16 October 2009–19 November 2009	6.75
17 June 2008–17 July 2008	16.25	20 November 2009–30 July 2010	6.50
18 July 2008–19 November 2008	16.75		

Source: Central Bank of Turkey.

of high interest rates and appreciation of the currency) or even made careless announcements in launching some policy measures, which sounded as though there was a conflict with the main objective of monetary policy.

In response to the deteriorating inflation outlook and the widening deficit between its inflation forecasts and the end-year target, the CBT sent a letter to the government on 3 June 2008 suggesting a major revision of the inflation targets. The existing inflation target of 4% for 2008

was clearly unreachable after the aforementioned supply-side shocks. The CBT made it clear that it was aware that the social cost of attempting to bring down inflation to the targeted level under the new economic conditions would be unacceptably high. The CBT's new proposal did not have a target for 2008. Instead, the CBT suggested its 2008 forecast of 9.3% should be considered as a guide. The CBT's new proposal aimed to bring down inflation at a much more moderate rate than before. New targets were stated as 7.5% for 2009, 6.5% for 2010 and 5.5% for 2011.

The government almost immediately agreed with the proposal and its new medium-term programme incorporated these targets. This move by the CBT was considered by the economic decision makers as realistic and the affirmative reaction by the government as reassuring. Therefore, in contrast to initial expectations, changing the inflation targets did not hurt the credibility of the CBT.

The global financial crisis hit Turkey through four channels. First, the banking and non-banking corporate sectors became net debt repayers to the rest of the world. Second, Turkey witnessed a sharp contraction in her exports. Third, the banking sector cut its credit lines to the real sector. Fourth, business confidence declined considerably. In this environment the rate of unemployment increased sharply and output contracted significantly (Table 8.1).

After the collapse of Lehman Brothers, the immediate need was to ease tensions in the foreign exchange market. First, from the second week of October 2008, the CBT started to play an intermediary role in the foreign exchange interbank market. Second, in late November 2008 the CBT started an easing cycle. From then the short-term policy rate was reduced by 10.25 percentage points in thirteen steps to 6.25% (Table 8.7). Finally, from mid-2009 the CBT took measures to ease domestic currency liquidity conditions. The most notable one was the mid-October decision to reduce the required reserve ratio for domestic currency deposits.

The sharp decline in commodity prices and the contractionary pressures on real economic activity put a significant downward pressure on inflation despite the nominal depreciation of the lira. This also helped the credibility build-up for the IT regime. At the beginning of 2009, there was virtually no difference between the target and the expected inflation level for the end of 2009. Despite the easing, the year-end inflation rate for 2009 was 6.5%, well below the 7.5% target (Table 8.6).

It will be fair to say that during this crisis period the CBT's major concern was financial stability, not inflation. However, mostly due to factors that were triggered by global developments, inflation also declined.

The CBT, on the other hand, in line with its concerns for the stability and soundness of the Turkish financial system, continued to decrease its policy rate. The banking sector benefited from this strategy, since it could adjust its short-term deposit rates in line with changes in the monetary policy rate. The loan rates, on the other hand were, in general, much more inflexible downwards. The second beneficiary of this policy was the Treasury. The decrease in the borrowing costs of the banking system was almost immediately reflected in the Treasury's borrowing rates, since private sector credit demand was weak.

8.8 Further remarks and conclusion

Recent developments in the global economy have underlined the importance of globalisation and movements of asset prices for monetary policy. It is generally argued that financial globalisation is an impediment to the implementation of monetary policy.[19] The period preceding the 2008 global financial crisis witnessed an increasing trend of financial globalisation that could render the monetary policies of emerging markets highly sensitive to changes in developed world interest rates, the risk appetite of foreign investors and economic policy news announcements in the developed world. Özatay et al. (2009a) show that the sovereign credit risks of a set of emerging market economies were significantly affected by the risk appetite of foreign investors and economic news releases in the US. On the other hand, Özatay et al. (2009b) provide evidence that for IT emerging countries the risk appetite of foreign investors significantly affects the short-term policy rates of central banks.

A related issue is the appreciation pressure on domestic currency created by large capital inflows during 'sunny days'. It should be pointed out that this creates extra problems for policymakers. On the one hand, appreciation of the domestic currency undermines competitiveness, which is a fundamental issue; on the other hand, it is the trigger for a strong attack on central banks by exporters and those that are lobbying on behalf of them, which is a communication issue.

The communication problem is that, since appreciation is instrumental in reducing inflation in countries with significant levels of pass-through, economic agents in general expect central banks not to react to it but to be keen to respond to developments that may lead to the depreciation of domestic currencies. Moreover, the foreign exchange channel is by far the fastest of all, that is, the foreign exchange market reacts to central banks' policy decisions almost immediately; therefore, most economic agents tend to connect central banks' decisions

with foreign exchange market developments, and tend to ignore central banks' announcements concerning their stances against exchange rate movements.

The fundamental issue is what should be the reaction of the central bank to the loss of competitiveness? This is a rather difficult question to answer, given that the role of the exchange rate in the monetary policy of developing countries that have adopted IT is a controversial issue (one that draws the attention of many researchers). Three not mutually exclusive ways of reacting can be proposed.

The first, and probably most obvious, response is to cut the policy rate, as long as the pass-through effect is at work and causes a decline in the inflation rate that is compatible with the target. However, there are limits to such a policy response, given that other factors can push inflation above the target and/or global interest rates can also follow a downward trend, maintaining the domestic-foreign interest rate differential intact.

The second response is to design various barriers, especially to short-term capital inflows. However, both the effectiveness and the desirability – notably in countries with low saving rates – of such controls are highly controversial.

The third response would be to revise the objective function of the central bank to incorporate some measure of competitiveness in addition to inflation and the output gap. Notice that even if the objective function of a central bank does not include the real exchange rate, to the extent that the real exchange rate significantly affects the output gap and inflation, the reaction function obtained from the dynamic solution of the optimisation problem of the central bank includes the real exchange rate. However, at least two objections can be raised to this response. First, such a move can complicate the signal extraction problem of market participants. Second, there is neither enough supportive theoretical work nor a well known example of such policy by an IT central bank.

Developing countries' experience indicates that almost all central banks feel themselves responsible for smoothing exchange rate movements. In general this is done in an ad hoc manner, that is, without explicitly introducing the exchange rate into the reaction function of the central bank. The merits of such an approach compared with switching into a 'hybrid IT regime' is a lively issue, which has been discussed recently both in the literature and in Turkey.[20]

The second major issue that challenges the IT approach is whether monetary policy can be used to prevent the formation of asset price

bubbles, which eventually burst. Recent movements in asset prices have drawn attention to the importance of such movements for financial system stability. The problem is rather complex, since it cannot be reduced to extending the consumer price indices by adding asset prices. One complication is that there are potential trade-offs between these two sets of prices. Another is that it is not clear whether central banks can effectively deal with asset price bubbles. That requires cooperation and a strong collective action by policymakers as well as by the regulatory bodies. However, as indicated in IMF (2009, chapter 3), central banks need to pay more attention to the problem of identifying the factors that drive asset price movements and to be prepared to act whenever necessary.

It seems that the conduct of monetary policy in Turkey in the coming years may face considerable difficulties. On the one hand, the CBT will have to take into account the disappointment of economic decision makers due to its apparent failure to achieve the targeted inflation levels in recent years. On the other hand, the 2008 global crisis made it clear that a globally coordinated policy response is needed to deal with such events in the future. The first issue is related to the credibility problem. However, the second may require a broader framework to deal not only with price stability, but also with financial stability as well.

Notes

1. The core of fully fledged IT was included in the 'implicit targeting' framework. That is: first, given that the main aim of the CBT is to achieve price stability, short-term interest rates were changed purely on the basis of the inflation outlook; second, whenever a decision was taken on interest rates, the rationale behind that decision was explained to the public in a press release. However, up to the beginning of 2005, some elements of fully fledged IT were missing: for example, the public did not know the meeting dates of the monetary policy committee, there was no voting in the monetary policy committee and the final decision on the policy rates was taken by a small group.
2. The GDP series were significantly revised in 2008. If the ratio is calculated from the old series it jumps to 104%. Although the new GDP series were not in the information set of the markets in the period mentioned, we use the new GDP series in what follows, to prevent confusion.
3. This section is largely based on Ersel (1991) and Bayazıtoğlu et al. (1991). See also Atiyas and Ersel (1994).
4. CBT (2002, Section IV, Item 1).
5. CBT (2002, Section IV, Items 10 and 11).
6. The law on the Central Bank of the Republic of Turkey, as amended by Law No. 4651, Article 4 (CBT, 2001).

7. The model presented in Blanchard (2005) shows how and under what conditions IT can have adverse effects. Blanchard further argues that Brazil found itself in such a situation in 2002 and 2003. Studying the recent experience of Brazil, Favero and Giavazzi (2005) show how the effectiveness of monetary policy depended on the fiscal policy regime in operation. Aktaş et al. (2005) derived a 'model-based' default risk series for Turkey during the 1999–2003 period by introducing an unobserved components model with time-varying parameters. They found that the arguments of Blanchard (2005) and Favero and Giavazzi (2005) are valid for Turkey also.
8. See Blanchard (1990), Sutherland (1997) and Perotti (1999) for such theoretical models. Giavazzi and Pagano (1990) show that private demand in Denmark and Ireland grew vigorously despite a reduction in the budget deficit of 7.2% during 1983–6, and 5.7% during 1987–9, respectively. Alesina and Perotti (1996) identify five more such episodes: Belgium 1984–7, Canada 1986–8, Italy 1989–92, Portugal 1984–6, and Sweden 1983–9. Giavazzi et al. (2005) find that for a panel of OECD countries sharp and persistent fiscal actions have non-standard effects on private consumption.
9. The EMBI+ takes into account total returns for traded external debt instruments (i.e. foreign currency-denominated fixed income) in the emerging markets. The EMBI index, on the other hand, covers only US dollar-denominated Brady bonds, loans and Eurobonds.
10. One may imagine that banks may not be able to understand the signals given by the central bank. Such a situation was highly unlikely in the case of Turkey. The central bank had long experience of communicating with the banking community. Therefore, despite the existence of problems with the sufficiency of the information thus revealed, 'central bank language' was not alien to the banking community. On the other hand, as was demonstrated in Ersel (2002), banks were capable of taking macroeconomic information into account in forming their major managerial decisions.
11. See Stiglitz and Greenwald (2003, chapter 8) for a discussion of the banking system-related factors that influence the efficiency of monetary policy.
12. We examine this effect in Section 8.5. See Table 8.5 and the discussion there.
13. It should also be pointed out that Turkey can be considered as an endogenously dollarised economy, a property that feeds the pass-through indirectly.
14. Kara and Öğünç (2008) approached exchange rate pass-through in terms of both the traditional cost channel (use of imported inputs) and the indexation channel. In order to detect possible changes in the exchange rate pass-through in such a setting, they used, first, a time-varying parameter model and, second, the seemingly unrelated regression model. Their findings indicate that there was a marked decline in the exchange rate pass-through after the adoption of the floating exchange rate regime with an implicit IT framework, thanks to a weakening of indexation behaviour. In other words, the exchange rate began to lose its function as a nominal anchor in the pricing behaviour of economic agents. However, the authors also warn that the impact of the exchange rate on inflation, especially in the tradable sectors, is still sizable in the long run and movements in nominal exchange rates have a significant impact on relative prices.

15. The cointegration vector is: Log (benchmark rate) = 0.345 + 0.907 * Log (CBT rate). The ADF test statistic for the stationarity of the residual of this equation is -4.3, which is significant at the 5% level. Hence, the two variables are cointegrated.
16. They use the sector-level data compiled by the CBT, which are based on the annual financial accounts of approximately 8,500 firms covering the period 1992–2003.
17. In Karadaş et al. (2006) it is shown that the average share of imported raw materials in total costs of firms in the manufacturing industry is 36.1%, whereas domestic raw materials and labour constitute 32.6% and 11.6% of total expenses, respectively.
18. The general framework of the IT regime was made public on 5 December 2005 (CBT, 2005).
19. For a discussion of this argument, see Rogoff (2006) and Woodford (2007).
20. For a survey of the problems associated with the exchange rate in IT developing countries, see, for example, Aizenman et al. (2008) and Stone et al. (2009). The hybrid IT regime is discussed in Roger et al. (2009).

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9

The Evolution of Monetary Policy in Egypt and Steps towards Inflation Targeting

Rania Al-Mashat

9.1 Introduction

Inflation targeting (IT) is one of the operational frameworks for monetary policy aimed at attaining price stability. In contrast to alternative strategies, notably money or exchange rate targeting, which seek to achieve low and stable inflation through targeting intermediate variables – for example, the growth rate of monetary aggregates or the level of the exchange rate against an 'anchor' currency – IT involves targeting inflation directly (IMF, 2005b). In a wider context, IT is part of a process in which economic policymaking is becoming more transparent and subject to greater accountability and technical rules, and less susceptible to discretionary actions. IT has become an increasingly popular monetary policy strategy. Since New Zealand adopted IT in 1989, twenty-nine countries have introduced IT frameworks (Roger 2010). Other countries are seeking to develop the necessary 'infrastructure' to implement an IT framework, Egypt being one. Moreover, according to Roger (2010: 52), 'IMF discussions with member states in 2006 suggested that the number of inflation targeters in developing and emerging market economies was likely to increase fourfold over the next decade, consistent with the estimate by Husain et al. (2005) that the number of countries with exchange rate pegs may almost halve in the next ten to fifteen years.' Nonetheless, the 2008 global financial crisis and the preceding boom-and-bubble period pose serious challenges to IT and to the conduct of monetary policy (Schmidt-Hebbel, 2010).

The technical details related to the adoption of IT are not trivial, and there are several country-specific factors that need to be taken into consideration.

Since June 2005, the Central Bank of Egypt (CBE) has taken serious steps to develop its monetary policy framework with the intention of adopting IT over the medium term. The exchange rate has been abandoned as the nominal anchor, and price stability has been declared the overriding policy objective. Key institutional and operational steps have been implemented in the transition. However, the repercussions of the international food price shock in 2008 followed by the global financial crisis have delayed the process somewhat. Research on monetary policy in Egypt has recently come to the fore as researchers try to investigate the inflation process and reconcile the requirements of IT with economic realities.

This chapter attempts to accomplish two tasks. Section 9.2 provides an overview of the evolution of monetary policy in Egypt over several decades with a focus on the determinants of money creation and the relationship between money and inflation. Section 9.3 discusses the steps undertaken by the CBE to adopt an IT framework, in light of the monetary policy framework launched in 2005 and in comparison to other emerging country cases. Section 9.4 concludes.

9.2 The evolution of monetary policy in Egypt

Since the beginning of the seventies, the evolution of monetary policy management can be categorised in the following periods: 1) between 1974 and 1990, during which direct monetary policy tools were used; 2) between 1991 and 2003, when there was a clear shift from direct to indirect monetary policy tools under the Economic Reform and Structural Adjustment Program (ERSAP) with the World Bank and the IMF[1] (Abou El-Eyoun, 2003), and 3) since 2003, following the announcement of the float of the Egyptian pound and the subsequent implementation of a comprehensive banking sector reform programme.

Handy et al. (1998: 56–8) provide details of the conduct of monetary policy up to 1998. They explain that until 1990 Egypt's banking system was highly repressed, as the CBE imposed interest rate limits on bank deposits and loans that were well below the rate of inflation. In particular, preferential interest rates were mandated for loans to public enterprises and to industrial and agricultural enterprises. At the same time, banks' operating costs were increased by a 25% (unremunerated) reserve requirement on domestic currency liabilities. While overall liquidity growth was largely determined by the borrowing needs of the government, the central bank also limited credit expansion to public sector companies and the private sector using maximum loan-to-deposit ratios and bank-specific ceilings for certain classes of credit.

In January 1991, the Egyptian authorities initiated an important series of reforms with the goal of giving a central role to market forces in the mobilisation of savings, allocation of credit and conduct of monetary policy. Moreover, banks' lending and deposit rates were liberalised. Subsequently, ceilings on bank lending to the private sector and bank-specific ceilings on lending to public sector companies were removed in October 1992 and July 1993, respectively. Steps were also taken to reduce the competitive advantage of public sector banks. In particular, public sector companies were authorised to deal with all banks without prior permission from a public sector bank.

With the elimination of direct credit ceilings on the private sector and public sector companies, the CBE moved toward increased reliance on indirect monetary policy instruments. To this end, the CBE instituted weekly auctions of three-month treasury bills. Over time, the supply of debt to the market was increased and longer maturities were introduced. The CBE has relied in part on the sale and redemption of treasury bills to regulate banks' reserves and thereby credit expansion. To strengthen the CBE's control over monetary conditions, changes were introduced to the reserve requirement policy. In particular, the coverage of the reserve requirement was extended to deposits of all maturities (Handy et al., 1998).

After the conclusion of the ERSAP, despite the improvements introduced in the conduct of monetary policy under the stabilisation programme between 1991 and 1996, the CBE was still attempting simultaneously to achieve multiple objectives that in many instances were conflicting. These objectives included attaining high economic growth while maintaining low inflation and preserving a stable exchange rate.[2] Between 1996 and 2005, the CBE's operational target was the excess reserves of banks, and given the strong link between monetary aggregates and inflation (as explained in the next subsection), growth in M2 was the intermediate target. In its toolkit, the CBE used various quantitative and price instruments at different points in time to achieve its multiple objectives, leading to a lack of consistency in monetary management.

These instruments included reserve requirements, government securities, repo and reverse repo operations and the CBE discount rate. Until June 2005, banks' excess reserves, which were highly volatile (Al-Mashat, 2009, figure 4.1), were the CBE's operational target. Moreover, linking the policy decisions to macroeconomic outcomes was complicated by the dominance of state-owned banks in the banking sector, which created rigidities in the interest rate structure, while the existence of large non-performing loans (NPLs) intensified the disconnection between price measures and macroeconomic outcomes.

A close examination of the various interest rates from 1996 to 2005 is particularly important as this period precedes the implementation of the new monetary policy framework and the CBE's announcement in June 2005 of its intention to put in place a formal IT framework once the fundamental prerequisites were met. The examination reveals that there is no single interest rate that best reflects the monetary policy stance. The movements in these interest rates appear to be secular, with no evident cyclical pattern, suggesting that the interest rate channel did not materially contribute to economic fluctuations in Egypt (Al-Mashat, 2009, figure 4.2):[3]

- the overnight domestic currency interbank market was introduced only in 2001, and the overnight interest rate proved extremely volatile in the beginning;[4]
- the three-month treasury bill rate could be considered, to some extent, a short-term policy rate, given that the securities were issued in coordination with the CBE to sterilise capital inflows, the amount issued being substantially in excess of the financing needs of the government (El-Refaie, 2001);[5]
- the CBE's discount rate is also a key policy rate, despite the limited changes that took place between 1996 and 2005.

Moreover, the coefficient of variation in the nominal policy interest rates (treasury bill rate and discount rate) was quite low, ranging between 0.1 and 0.3 throughout the period. This was reflected in the nominal retail rates, which also demonstrated low variability, ranging between 0.04 and 0.1. In addition, Granger causality tests suggest a weak interest rate transmission channel for Egypt during this period. This result is not surprising given that the CBE's operational target at the time was banks' excess reserves, which were highly volatile. In other words, quantitative measures undertaken by the CBE were considered more effective in steering aggregate demand.[6] Summing up, between 1996 and 2005, the CBE did not have a continuous indicator of the monetary policy stance.[7]

Money and inflation

Monetary growth has historically been closely correlated with inflation in Egypt and hence M2 was used as the intermediate target of monetary policy. More precisely, inflation in the medium term is viewed as the result of the government's financing of its deficit through the creation of money or the result of time-inconsistent monetary policy.

Handy et al. (1998: 19–21) describe the inflation episodes in Egypt between 1970 and 1996, highlighting the fact that following the first oil shock in 1973 and up to the mid-1980s inflation jumped from 5% to an average of 13%. The pace of inflation then accelerated to average more than 20% annually between 1986 and 1992. With the help of the reforms undertaken in the context of the ERSAP, inflation was brought down to single digits again by 1997 and subsequently remained there until 2001. At the beginning of 2002 and in the aftermath of the first attempt at floating the exchange rate in January 2003, the situation changed. Between January 2002 and April 2004, inflation followed a steep upward trend, with a peak of 21.7% (y/y), reflecting the lagged pass-through pressures from the step devaluations and amplified by the depreciations that followed the shift in the exchange rate regime to a managed float in January 2003 (Figure 9.1). Monetary policy was tightened in 2004 to rein in the accelerating inflation, which fell significantly during 2004 and 2005 as the effect of the depreciation of the pound in early 2003 gradually dissipated and confidence in the central bank was restored. Inflation remained more or less tame until the international food price shock erupted towards the end of 2007.

There was an association between inflation and monetary aggregates during the abovementioned episodes. During the period following the first oil shock, moderately high inflation was accommodated by a rapid monetary expansion averaging nearly 30% every year. In the

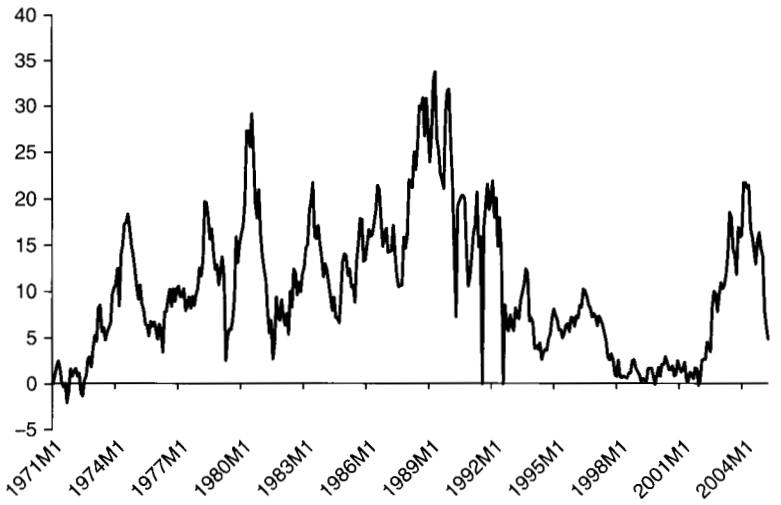

Figure 9.1 Inflation (wholesale prices, annual percentage change)

subsequent low-growth and chronic inflation period, growth of broad money decelerated and averaged only 20%. The stabilisation period under the ERSAP was associated with further (and sharp) deceleration in monetary growth.

It is important to decompose the growth of the counterparts to broad money into changes in net foreign assets and net domestic assets, and further to decompose the latter into credit to the public sector (government and state-owned enterprises) and the private sector. Inflation during the high-growth and moderate inflation period was largely a monetary phenomenon. In turn, money growth was explained by a sharp growth in credit to the public sector, a reflection of the rising budget deficits (Figure 9.2). During that period, the net foreign assets (NFA) of the banking sector were declining with a contractionary impact on broad money. In the subsequent chronic inflation period (1986/1987–1991/1992), domestic credit creation remained a key to overall money growth (albeit to a lesser extent than in the previous period). Credit growth to the public sector was the key to overall monetary growth. The stabilisation period witnessed an important structural transformation in the factors explaining monetary growth. Most important, as the budget deficit declined, credit to the public sector became a relatively insignificant counterpart to total monetary growth (Figure 9.3). Instead, the sharp increase in credit to the private sector emerged as the most important contributor. The success in reducing inflationary pressures during this phase was ultimately due to the improved fiscal stance, which had alleviated the pressure on domestic liquidity growth coming from the financing of the government deficit.

Surges in capital inflows in 1991–3 and again in 1996–7 and the subsequent rise in the level of official international reserves also placed sustained upward pressure on monetary aggregates (Figure 9.4). However, the successful management of capital inflows ensured that inflation was kept under control in spite of the large increases in the foreign assets of the banking system.

Examining the period preceding the implementation of the new monetary policy framework in 2005 is particularly useful. A closer investigation of the data suggests that three distinct phases can be identified between 2000 and 2005.

Phase I: January 2000–December 2001

Between January 2000 and December 2001, the consumer price index (CPI) and wholesale price index (WPI) inflation rates were relatively low, hovering around 2.5% (y/y) and 1.4% (y/y), respectively, with

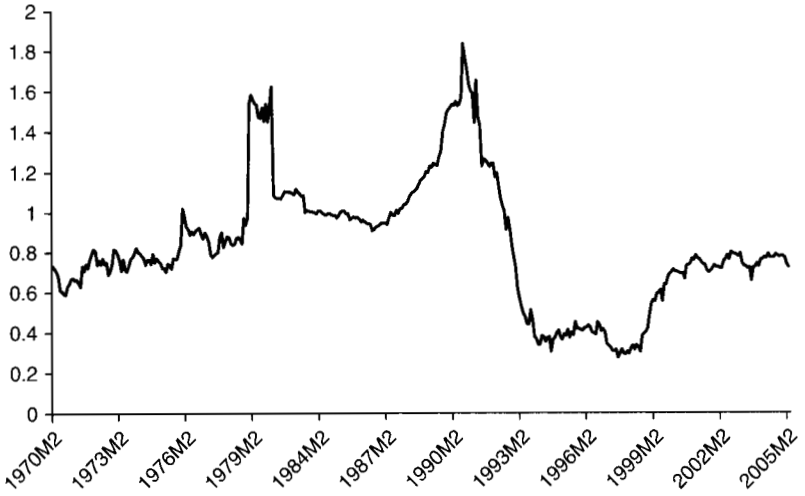

Figure 9.2 Net claims on government in % of reserve money

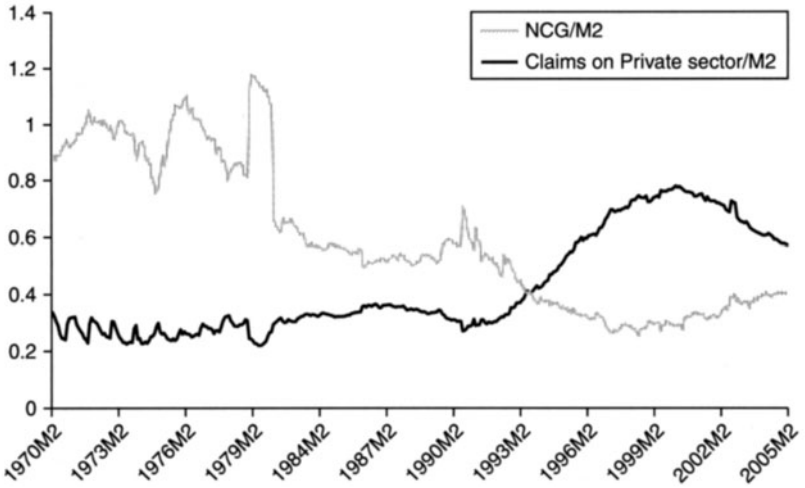

Figure 9.3 Net claims on government and claims on the private sector in % of M2

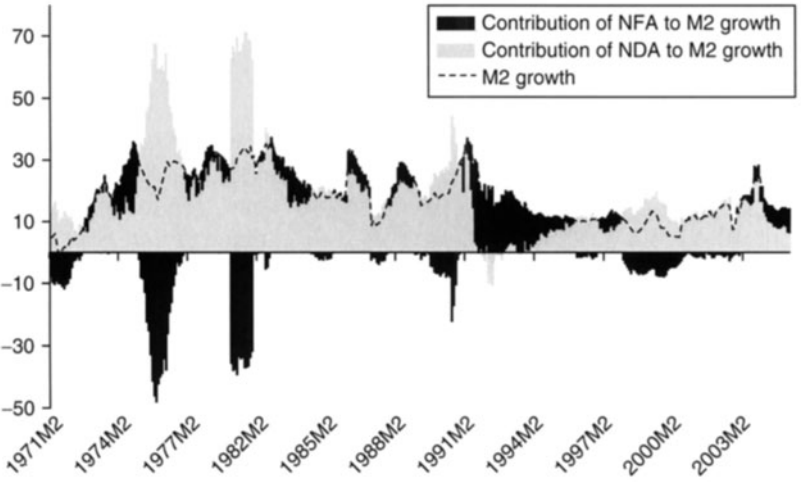

Figure 9.4 Contributions of net foreign assets and net domestic assets to M2 (%)

minimal signs of volatility. The low and stable inflation rates during this phase can be traced back to the prevalent exchange rate regime at the time, which in a way insulated domestic prices and, in turn, inflation from exchange rate shocks that could have been passed through to the WPI through import prices and would then, given the clear association between the WPI and the CPI, have been transferred to the CPI. The exchange rate regime, however, limited the degree of exchange rate pass-through to domestic prices. Moreover, while net domestic assets explained the bulk of the growth in monetary aggregates during this period, net claims on the private sector were the largest contributor.

Phase II: January 2002–April 2004

At the beginning of 2002 and in the aftermath of the first attempt at floating the exchange rate in January 2003, the situation changed. Between January 2002 and April 2004, CPI and WPI inflation followed a steep upward trend to reach a peak of 17.2% (y/y) and 21.7% (y/y), respectively. The higher inflation in Phase II reflected the lagged pass-through pressures from a series of step devaluations, amounting to a cumulative depreciation of 29% in the nominal EGP/USD exchange rate between January 2000 and December 2001.[8] These were amplified by the 19.5% month-on-month depreciation that followed the shift in the exchange rate regime to a managed float in January 2003.

The upward pressure on inflation was further intensified by the lax monetary policy stance pursued by the CBE at the time. This was evident in the acceleration of broad money (M2) and total domestic liquidity (M2D), which grew on average at more than 15% and 12% annually, with peaks of 20% and 13% in late 2003/early 2004, respectively. This acceleration in monetary aggregates, which was mainly due to increased claims on the private business sector, was not accommodated by similarly high real GDP growth, and so led to double-digit inflation. On the contrary, the real GDP growth rate decelerated relative to Phase I, to average 3.5% annually between 2002 and 2004. This seems to have strengthened the resistance of inflation to the downward pressures that were starting to pass through the exchange rate channel in the first half of 2004, delaying the fall in inflation to early 2005.

Phase III: May 2004–November 2005

During 2004 and the first half of 2005, the CBE tightened monetary policy to rein in the accelerating inflation rates, and it was successful in this, as inflation dropped to single-digit levels once again from January 2005. As the effects of the depreciation of the Egyptian pound in early 2003 gradually dissipated and confidence in the CBE was restored, CPI and WPI inflation rates dropped significantly between mid-2004 and early 2006, averaging 7.5% (y/y) and 8.1% (y/y), respectively.

It is worth noting that in 2005, with the continuing monetary expansion reflected in the average growth rates of 14% and 17% in M2 and M2D, respectively, inflation could have been expected to shoot up again as it did in Phase II following similar growth rates of the money supply. This was not the case, however, as inflation fell from 7.9% to 2.7% over 2005. The stabilisation of the nominal exchange rate certainly played a key role in reducing inflation, but it was not sufficient to accommodate lagged inflationary pressures from the money supply. Hence, it is likely that the observed money growth rates were non-inflationary. In fact, the M2 and M2D growth rates (Al-Mashat, 2009, figures 4.3 and 4.4) were inflated by the introduction in August 2004 of the three-year saving certificates issued by the National Bank of Egypt. Although these certificates appear as an expansion in total liquidity, they are effectively locked up for three years. Given the interest premium paid on them at the time and the lack of alternative financial assets in the Egyptian market, it is unlikely that these certificates will be unlocked before their maturity date. Excluding the three-year saving certificates from M2 and M2D, we observe instead a sharp deceleration in money growth, which fell from averages of 16% and 12%

between January 2002 and April 2004 to 8% and 9% between May 2004 and November 2005.

After 2005, and on the back of the economic and financial reforms that had been taking place, Egypt faced a surge in capital inflows, both foreign direct investments (FDI) and portfolio investments, FDI reaching a USD 13 billion peak in 2007. These developments were reflected in the growth rate of the money supply, which accelerated sharply under pressure from capital inflows to reach 24% in March 2008. The growth in NFA explained the bulk of the M2 growth until the beginning of the global financial crisis in the summer of 2008. The picture changed following the collapse of Lehman Brothers, as the global economy slowed down significantly and capital inflows to emerging economies abruptly reversed, leading to a decline in M2 growth. The decline in capital inflows, coupled with countercyclical fiscal policy, led the contribution of net domestic assets to M2 growth to exceed the contribution of NFA (Figure 9.5).

Concomitant with the surge in capital inflows, an international food price shock of unprecedented magnitude erupted towards the end of 2007. This shock peaked in the third quarter of 2008 before dissipating towards the end of 2008. The period between May 2007 and July 2008 represents one of the sharpest accelerations ever in international

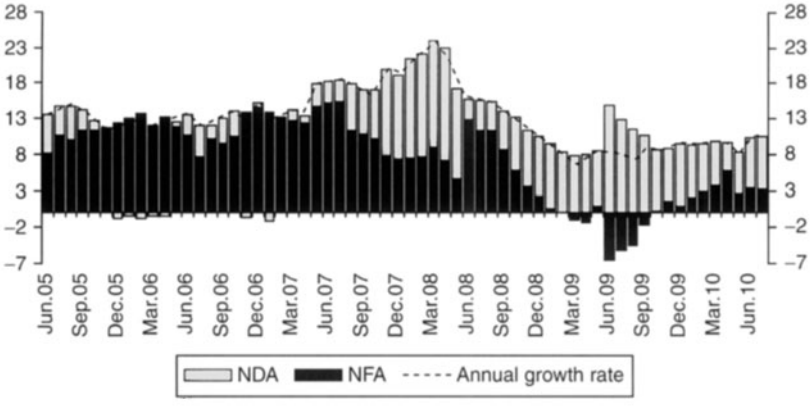

Figure 9.5 Contributions of net foreign assets and net domestic assets to M2, 2005–10 (year-on-year, %)

food prices, with a cumulative price increase of 45.5%. A sharp reversal in the domestic inflation dynamics started to emerge, fuelled by a complicated mix of inflationary pressures arising from 1) persistently high imported inflation related to soaring international food prices; 2) stronger demand pressures as reflected in buoyant consumer spending and robust investment growth, reflected in M2 growth; 3) broad-based regulated price adjustments as part of the government's fiscal consolidation programme. These factors pushed up headline inflation to 24% in August 2008 (Figure 9.6). In a bid to check the recent jump in headline inflation in Egypt and to anchor inflation expectations, from February 2008 the CBE raised interest rates six months in a row a cumulative 275 basis points.

For Egypt, empirical evidence suggests that money gap models outperform output gap models in explaining inflation dynamics (Al-Mashat, 2009; Noureldin, 2005). However, while money gap models have outperformed other models in capturing the inflation dynamics, in the case of monetary targets, instability in money demand relationships – commonly associated with financial system reforms and the opening of capital markets – undermines the usefulness of monetary aggregates as policy guides (Roger, 2010).

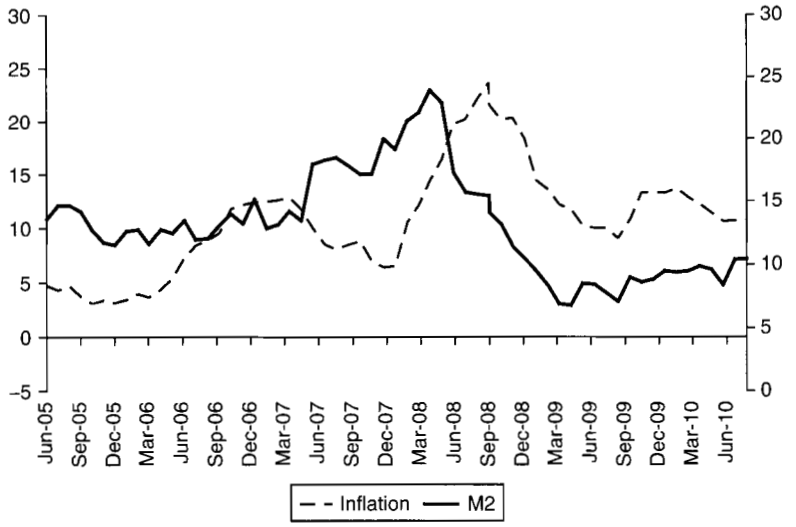

Figure 9.6 Broad money and inflation, 2005–10 (year-on-year, %)

1/ Using broad money (M2) as a measure of money supply and inflation based on the CPI index

9.3 Egypt: steps towards inflation targeting, and a comparison with other IT countries

In the literature a relatively long list of requirements has been identified for countries to successfully operate an IT framework. These requirements include, but are not limited to, the following (Jonas and Mishkin, 2003: 1) a strong fiscal position and entrenched macroeconomic stability; 2) a well developed financial system; 3) central bank instrument independence and a mandate to achieve price stability; 4) reasonably well understood channels between policy instruments and inflation; 5) a sound methodology for devising inflation forecasts; 6) transparent policies to build accountability and credibility.

The conditions under which countries have implemented IT have been diverse, including the inflation rate at the time of inception, the degree of exchange rate flexibility, the level of financial sector development, the government's fiscal position, and the level of economic growth. Experience has shown that the transition to IT can vary greatly from one country to another. For instance, Chile spent more than ten years in a transition from quasi-IT to fully fledged IT. On the other hand, Brazil's transition was triggered by a crisis and took only a few months. Other country examples, such as that of the Czech Republic, provide an intermediate case. It is not possible to say whether a country meets the requirements or not; it is more a question of the degree to which they are met. Generally speaking, it has been argued that countries that have adopted IT met these requirements to a degree sufficient to make IT feasible (Roger and Stone, 2005). Accordingly, the CBE launched a comprehensive and far-reaching banking sector reform programme in 2004. This included the (non-performing-loans-related) restructuring and privatisation of banks with state participation, a new banking law and other regulatory reforms, the liberalisation of the foreign exchange and money markets, and ongoing efforts to strengthen the supervision of banks. This programme contained important steps to help overcome the previous shortcomings in the banking sector and fulfil the prerequisites for IT. Several institutional and operational changes were initiated under the programme to facilitate monetary policy formulation and assessment and to lay the groundwork for the formal adoption of an IT regime over the medium term. Nonetheless, as highlighted in Roger (2010), the adoption of IT as part of a comprehensive package of economic reforms complicates the conduct of monetary policy. Such reforms often involve structural changes affecting the long-run equilibrium values and dynamics of

key macroeconomic variables, making it extremely difficult to forecast or react with any degree of policy precision to economic developments. These challenges are often compounded by lack of good-quality, timely macroeconomic data. Such complications do not necessarily preclude IT but they mean that achieving targets is likely to be particularly challenging. In the light of the banking system reform programme, and taking into account the experiences of other countries, this section assesses and compares Egypt's readiness for IT with that of other emerging market inflation targeters.

Macroeconomic stability

Macroeconomic stability supports monetary policy formulation and creates an environment conducive to the building of policy credibility, an important prerequisite for IT. In determining the appropriate disinflation path, the central bank should have an estimate of the sacrifice ratio in order to weigh the costs of foregone output against the benefits of lower inflation. Therefore, adopting IT is greatly complicated when inflation and output are high and volatile, since disinflation is unlikely to be achieved without significant costs to output. Based on the indicators for macroeconomic stability presented in Table 9.1, Egypt could be considered eligible to adopt IT. Egypt launched its banking sector reform programme in 2003. From then and up to the end of 2006, Egypt experienced lower inflation rates and output variability than the comparator IT countries listed. Towards the end of 2007 a sharp reversal in the inflation dynamics started to emerge, as explained earlier. Therefore, it is important to distinguish between the two periods, namely 2003–6 and 2007–9. Nonetheless, these developments, while challenging, should not preclude the adoption of IT.

Central bank independence and credibility

Banking Law No. 88 of 2003 granted the CBE instrument independence and declared price stability as the overriding objective. The CBE is instrument independent (meaning that the central bank is free to set monetary policy instruments but not necessarily free to determine the ultimate inflation target), as monetary policy decisions are confidential, discretionary and the sole responsibility of the Monetary Policy Committee (MPC), which consists of nine members of the CBE Board of Directors, in accordance with Banking Law No. 88 for 2003.[9] The CBE has full operational independence to achieve the inflation target. It is important to underline that the interest rate decisions of the MPC are not known to the government and the market except on the

Table 9.1 Macroeconomic indicators

	IT adoption	Inflation rate (CPI, period average)	Inflation variability	Real GDP growth rate	Output variability	Current account/ GDP
Chile	Sep-99	5.48	0.31	4.23	0.84	−3.44
Czech Republic	Jan-98	9.29	0.10	3.76	1.66	−4.52
Turkey	Jan-06	9.34	0.80	7.05	0.20	−3.59
Poland	Oct-98	18.67	0.38	8.86	0.63	−2.30
South Africa	Feb-00	6.13	0.46	1.75	0.68	−0.97
Israel	Jun-97	10.63	0.14	5.97	0.40	−4.50
Mexico	Jan-01	12.09	0.41	3.84	0.74	−3.26
Brazil	Jun-99	6.34	0.58	1.74	0.84	−4.04
Comparator IT average		*9.75*	*0.40*	*4.65*	*0.75*	*−3.30*
Egypt						
2003–6		7.14	0.59	4.71	0.34	2.90
2007–9		12.90	0.26	6.33	0.22	0.00

Note: Numbers for the IT comparators are the four-year averages prior to the adoption of IT.

following business day through the officially published press release (MPC statement).

These institutional settings are important and provide adequate mechanisms for the CBE to decide on the target, once it makes the transition from price stability to IT. It has not been decided which entity will be responsible for eventually setting the target: the CBE or the government. In other words, whether the CBE will have target independence or not is yet to be determined. However, experience from other countries has shown that it works better if the target is set by the government, not by the central bank (Mishkin and Schmidt-Hebbel, 2001). Debelle and Fischer (1994) and Fischer (1994) make a useful distinction between goal independence, in which the central bank sets the goals of monetary policy, and instrument independence, in which the central bank controls monetary policy instruments. Instrument independence for central banks is supported by the need to insulate the central bank from short-term political pressures that may lead it to pursue time-inconsistent, expansionary policy with bad long-term outcomes. However, the argument that the central bank's long-term preferences should coincide with society's preferences suggests that a central bank should be goal dependent. Having the government decide on the

Table 9.2 Accountability in selected inflation targeting countries

Country	Instrument independence	Inflation targeting explicitly in the law	Target announcement	Hearing in parliament
Brazil	Yes	No	Set by National Monetary Council, composed of finance minister, planning minister and central bank president	No
Chile	Yes	Price stability + financial stability	Central bank	Yes
Czech Republic	Yes	Price stability	Government + Central bank	Yes
Israel	Yes	Price stability	Government	Yes
Mexico	Yes	No, price stability	Central bank	Yes
Poland	Yes	No, price stability	Central bank	Yes
South Africa	Yes	No, currency stability	Government	No
Turkey	Yes	Price stability	Government + Central bank	No

Source: Roger and Stone (2005).

long-term inflation target for the central bank is thus desirable. Table 9.2 shows that in IT comparators in emerging markets the central bank has instrument independence. However, goal independence is not granted in all cases and has varied across countries. In some instances, the government and the central bank jointly decide on the target.

Monetary policy operating targets and instruments

Under an IT regime, price instruments for the conduct of monetary policy are most commonly used by central banks. In addition, IT relies on a functioning and competitive banking system. Only in these circumstances can the interest rate channel become strong; and this is the most convenient mechanism, as the exchange rate channel should not be relied upon. Under IT, the exchange rate is abandoned as the nominal anchor and replaced by an explicit price stability objective.[10] Interest rate decisions, and therefore the interest rate transmission channel, become important because they are easy to interpret and communicate

to the public.[11] Schmidt-Hebbel and Tapia (2002) argue that central banks require a thorough understanding of the intensity and lags with which their policy interest rate affects the economy and in particular the dynamics of their policy objectives – the inflation target in the case of IT. Restoring confidence in the foreign exchange market and replacing quantitative monetary instruments with price instruments were the cornerstones of the CBE's monetary policy reform programme, and important prerequisites for launching IT. The exchange rate has been abandoned as the nominal anchor, and price stability has been declared the overriding policy objective. The CBE is committed to achieving, over the medium term, low rates of inflation, which it believes are essential for maintaining confidence and for sustaining high rates of investment and economic growth.[12] Al-Mashat (2011) provides evidence that a fixed exchange rate generates the highest output and inflation variability in the Egyptian case. Egypt made the transition to a unified, flexible exchange rate regime during 2004. The parallel market rate, which had a premium of over 15% in late 2003, converged with the banking rate in the second half of 2004 as confidence was restored, leading to strong current account inflows. In December 2004, the government abolished the surrender requirement (introduced in 2003) and formally launched an interbank market by enacting a convention governing foreign exchange trading among all signatory banks. In subsequent weeks, activity in the interbank market surged, and flexibility in rate-setting was restored. Furthermore, on 2 January 2005, Egypt accepted the obligations of the IMF's Article VIII. The CBE focused on ensuring an orderly functioning of the interbank market, including opportunistic purchases of foreign exchange. The establishment of the interbank market for foreign exchange was a milestone in Egypt's transition to a unified flexible exchange rate system, and the CBE is committed to allowing market forces to determine the exchange rate. Favourable trends in the balance of payments and increased confidence contributed to the high volume of trading in the interbank market. As highlighted above, it was important for the CBE to move from quantitative to price tools of monetary policy. On 2 June 2005, the CBE introduced an interest rate corridor. The interest rates on the CBE's two standing facilities, the overnight lending facility and the overnight deposit facility, define the ceiling and floor, respectively, of the corridor. By setting the rates on the standing facilities, the MPC determines the corridor within which the overnight rate can fluctuate (International Monetary Fund, 2005c). Table 9.3 highlights the monetary policy instruments used by the CBE. Steering the

overnight rate within this corridor is the effective operational target of the CBE. This is what defines the CBE's operational independence. Moreover, in August 2005, CBE certificates of deposit were added to the toolkit. The CBE issues its own securities as the primary instruments for liquidity management through open market operations. Since the launch of the corridor, volatility in the overnight interbank rate has declined and the rate has remained within the corridor.[13] Since the launch of the new monetary policy framework, the results of a Granger causality test indicate that the overnight interbank rate has started to assume a strong role in the interest rate channel. It Granger-causes both the interest rates on three-month deposits and new bank borrowing.[14] This supports the CBE's monetary policy strategy going forward, as the overnight rate has continued to maintain this clear signalling role.

Strengthening and developing the banking sector

A deep and well developed banking sector is also important to allow for proper transmission of monetary policy actions. Monetary policy within an IT framework is highly market oriented, and the banking sector is expected to function on the basis of market principles. The dominance of the state-owned banks in the market has tended to create rigidities in the interest rate structure in Egypt, as discussed previously. Under the banking system reform programme, the banking sector is undergoing a substantial transformation that has entailed the exit of several weak banks, large-scale financial restructuring, divestiture of state shares in private banks and privatisation of a major state bank.

Table 9.3 Egypt: monetary policy instruments

	Status (Yes/No)
Indirect instruments	
The Corridor: Standing deposit facility, Standing credit facility	Yes, used
Interbank rates stay within a corridor	Yes, used
Deposit auctions	Yes, used
Central bank securities auctions	Yes, used
Open market operations with securities	Yes, used
Derivatives in the foreign exchange market	Yes, there are swap operations
Direct Instruments	
Frequent changes to required reserves	No

Table 9.4 Financial sector indicators

	IT adoption	M2/GDP	M2 growth	Credit to the private sector/GDP
Chile	Sep-99	41.7	16.3	57.6
Czech Republic	Jan-98	61.6	11.5	59.0
Turkey	Jan-06	21.4	33.9	24.6
Poland	Oct-98	29.7	30.0	20.0
South Africa	Feb-00	49.7	12.7	58.2
Israel	Jun-97	68.7	21.6	66.8
Mexico	Jan-01	40.5	20.8	18.3
Brazil	Jun-99	25.6	11.7	38.8
Comparator IT average		*42.4*	*19.8*	*42.7*
Egypt				
2003–6		88.3	14.6	6.0
2007–9		84.8	14.5	8.4

Note: Numbers for the IT comparators are the four-year averages prior to the adoption of IT.

These actions have reduced the share of banks with state participation significantly.[15] The large stock of NPLs is being addressed through provisioning and cash settlements. The government and the CBE have been implementing programmes designed to clean up banks' balance sheets and settle the NPLs of public and private enterprises. Compared with the sample of emerging market IT countries in Table 9.4, Egypt's banking sector is reasonably well developed, as reflected in the growth rate of monetary aggregates and M2/GDP. Nonetheless, credit to the private sector as a percentage of GDP has been exceptionally low, in contrast to the IT comparators. This, however, is expected to improve as competition in the banking sector intensifies.

The fiscal position

Fiscal discipline is a key requirement for IT. Large levels of indebtedness that could be monetised by the central bank jeopardise its credibility in meeting the inflation target over the medium term. In addition, if central banks are politically pressured to finance government deficits or to avoid a policy tightening when needed to account for a rising interest rate bill, the credibility of the price stability mandate is compromised. Therefore, in many instances, the central bank legal framework in IT countries limits or prohibits financing of government spending. Moreover, instrument independence is intended to ensure that political

interests do not impair monetary policymaking. Compared with other emerging market countries that have introduced an IT framework, Egypt's budget deficit has been high, and the level of public debt has been around 95% of GDP. These comparisons are presented in Table 9.5. It is worth mentioning that a process of fiscal consolidation is currently under way in Egypt. The government has outlined a range of measures aimed at bringing the deficit down by at least 1% of GDP annually for five years. The plan involves a mix of measures that have been phased in gradually since 2006/2007. However, these key fiscal reforms have been temporarily postponed, as fiscal policy has helped to cushion the impact of the global financial crisis. The government reacted quickly by providing a sizable fiscal stimulua in the second half of 2008/2009, which focused on accelerating investment projects (about 1% of GDP) and public–private partnership (PPP) investments (1% of GDP) (International Monetary Fund, 2009). Resuming medium-term fiscal consolidation is crucial to addressing fiscal vulnerabilities and encouraging private investment. Fiscal vulnerabilities are Egypt's main macroeconomic risk. Gross public debt remains high by emerging market standards and fiscal financing requirements (arising from the rollover of existing debt as well as the ongoing deficit) have averaged around 25% of GDP in recent years (International Monetary Fund, 2010).

Table 9.5 Fiscal indicators

	IT adoption	Fiscal balance/GDP
Chile	Sep-99	0.1
Czech Republic	Jan-98	−0.4
Turkey	Jan-06	−7.0
Poland	Oct-98	−3.1
South Africa	Feb-00	−2.7
Israel	Jun-97	−2.9
Mexico	Jan-01	−5.0
Brazil	Jun-99	−7.7
Comparator IT average		−2.8
Egypt		
2003–6		−9.1
2007–9		−7.1

Note: Numbers for the IT comparators are the four-year averages prior to the adoption of IT.

Transparency of monetary policy

Transparency and open communication are key features in the adoption of a successful IT framework. In addition, public accountability is essential. The need for explicit accountability mechanisms in IT is due to the lag between monetary policy actions and inflation. The appropriateness of the monetary policy stance cannot be assessed on the basis of the latest inflation figures. Equally important to underline is that in the absence of credibility the inflation target will not be a useful guide to inflation expectations, a situation which renders monetary policy actions ineffective. In IT countries, policy actions tend to be announced immediately by a press release, and minutes of monetary policy committee (MPC) meetings are often published. Heenan et al. (2006) provide a detailed discussion on this and also supply country examples. In the Egyptian context, to enhance transparency and help anchor inflation expectations, MPC decisions are communicated to the market through a monetary policy statement, which is released on the CBE's external website after each meeting. There are plans to publish the minutes of MPC meetings. In addition, a comprehensive communication strategy has been developed and is under implementation. This strategy includes regular meetings with commercial banks, representatives of the private sector, journalists, think tanks and research institutions. In addition, designing the modalities of regular press conferences and attending academic conferences are part of the communication strategy. The blueprint for the inflation report and analytical notes on key macroeconomic variables, to inform the public about macroeconomic developments and explain the CBE's monetary policy stance, have already been prepared but have yet to be published. Compared with other IT countries, there is scope for improvement in this area for Egypt.

Data requirements and strengthening the macroeconomic database

Monetary policy under IT requires relatively high-quality, timely and high-frequency macroeconomic data. Strengthening the macroeconomic database has been a key priority in Egypt. Egypt has subscribed to the IMF's Special Data Dissemination System (SDDS), which requires the prompt posting of various macroeconomic datasets, compiled in line with best international practice and comparable across countries. Moreover, recognising the need to further improve statistics, in 2005 the CBE agreed to the publication of the IMF ROSC (Report on the Observance of Standards and Codes), which evaluates the macroeconomic datasets and provides recommendations to improve them (International Monetary Fund, 2005c and 2007).

Table 9.6 Status of forecasting and modelling

	Status (Yes/No/ In progress)	Details
CPI and core inflation		
- Construct core CPI	Yes	The CBE constructs its own core inflation measures, excluding regulated items and volatile food items. The core inflation series, including monthly inflation notes, have been published since October 2009.
- Seasonally adjusted estimates of CPI	Yes	
- Estimate sub-groups of CPI	Yes	The CPI basket has been split into sub-groups: food, non-food and service.
Modelling		
- Analysis of exchange rate pass-through	Yes	The degree of pass-through from the exchange rate to the CPI and WPI inflation rates was quantified in an empirical study, utilising a five-variable VAR model. The responses of CPI and WPI to exchange rate shocks have been obtained.
- Effect of interest, credit and exchange rate channels	Yes	VAR analysis has been conducted. The relationships between the variables and the response have been obtained.
- Inflation forecasting	Yes	The CBE carries out near-term forecasts for one quarter ahead. In addition, there are medium-term forecasts.
- Quantitative	Yes	
- Graphic and numeric	Yes	
- Stochastic	In progress	Developing this type of models is under way within the CBE.
Estimate of potential GDP	Yes	
Quarterly structural model (multi-equation)	In progress	Developing this type of models is under way within the CBE.
Other		
- Business surveys with inflation indicators (wage, profitability, capacity constraints, input and output prices, and inflation expectations)	Yes	The ECES puts out a business barometer, which surveys business confidence. However, more needs to be accomplished in this area.
- Household surveys of inflation expectations	No	

Despite data shortcomings, the CBE has strengthened its analytical and forecasting capabilities. The Monetary Policy Unit was established within the CBE to play a key role in providing objective monetary policy analysis, assessment and modalities of communication with the market through its research and other functions. Alternative models to forecast inflation have also been developed. Assessing and improving the current forecasting models used in monetary policy formulation is a continuous process. Table 9.6 highlights the status of inflation modelling and forecasting.

9.4 Conclusion

Over the last few years the CBE has taken many important steps to upgrade Egypt's monetary policy with a view to adopting IT as a monetary policy framework once the prerequisites are fulfilled. Under the new banking law, the CBE was granted more independence, and an explicit institutional framework was set up for interest rate determination. In addition, the structural reforms under way in the banking sector have led to improved efficiency and competition among banks, steps that are expected to facilitate monetary policy transmission. There are, however, a number of outstanding issues that need to be addressed before Egypt will be ready to adopt a fully fledged IT framework. In particular, efforts are needed to consolidate the fiscal position and improve the macroeconomic database.

Notes

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1. In the early 1990s, Egypt launched an Economic Reform and Structural Adjustment Program (ERSAP) to eliminate the internal and external disequilibria caused by many years of high inflation, intolerable fiscal deficits, lack of competitiveness in world markets, and soaring degrees of external indebtedness. Central to the process were three critical elements: a massive fiscal adjustment, the liberalisation and unification of the exchange system, including the adoption of an exchange rate anchor, and a supportive monetary policy comprising quantified targets in the context of successive financial programmes. Monetary policy during this period was designed primarily to defend the exchange rate, which did not conflict with achieving the country's growth objectives as well. The stabilisation programme,

launched in 1991 and completed in 1996, was successful in restoring the desired macroeconomic stability.

2. According to Banking and Credit Law No. 163 of 1957 and the amendments in decision 59 of 1993, supporting economic development in light of the government's economic plan while maintaining the stability of the Egyptian pound were the final targets.
3. Al-Mashat and Billmeier (2008) provide a unified empirical framework, combining a descriptive review of Egyptian monetary policymaking over the last decade with a baseline VAR model that describes the Egyptian economy. By adding extensions to the baseline model, they investigate specific monetary transmission channels.
4. After the liquidity problems that surfaced in the market during 2000 and 2001, the CBE supported the launch of a domestic currency interbank market. The CBE's monetary policy framework change in 2001 enhanced the degree of market determination of the short-term interest rate. Before the introduction of the overnight interbank market, the short-term policy rate moved only within a very restricted range, rendering it a rather weak signal of the monetary policy stance.
5. During this period, interest rates on treasury bills provided some indication of market conditions, as they served as a basis for open market operations and they were traded on a secondary market. But given their role in fiscal policy, it would be misleading to consider them a monetary policy instrument.
6. The empirical results in Al-Mashat and Billmeier (2008) show that the interest rate channel of monetary policy is still weak in Egypt.
7. Moursi et al. (2007) compare various strategies developed during the 1990s to identify the monetary policy stance in Egypt. They argue that the CBE, between 1980 and 2005, did not rely on a single short-term policy rate but used several interest rates.
8. Rabanal (2005) finds that the wholesale price index (WPI) reacts significantly to changes in the nominal exchange rate after six to twelve months, whereas the consumer price index (CPI) reacts after twelve to twenty-four months, but not significantly. This result is interpreted as evidence of specific structural weaknesses of the CPI measure used until 2003 – beyond the fact that a significant share of administered prices contributes to a slow pass-through.
9. In addition, Banking Law No. 88 for 2003 asserts the independence of the CBE and its Board, whose members are appointed directly by the President of the country.
10. Although a functioning exchange rate transmission channel may add to the effectiveness of monetary policy under IT, it is likely that actively manipulating the exchange rate along with inflation is likely to worsen the performance of monetary policy. See Jonas and Mishkin (2003). However, this does not imply that central banks should not pay attention to the exchange rate (Mishkin and Schmidt-Hebbel 2001).
11. As described in Schaechter et al. (2000), earlier experiences of IT countries involved a combination of exchange rate and inflation targeting. For example, Chile spent more than ten years in a transition from quasi-inflation targeting to fully fledged inflation targeting. During this period,

the monetary policy framework was based on a crawling peg exchange rate regime as well as announcements of an inflation target. The aim in announcing inflation targets was to gradually reduce inflation by providing a focal point anchor for monetary policy that was supplementary to the existing crawling exchange rate band. Similarly, in Israel the long transition to IT began with the move to a crawling exchange rate band, which necessitated inflation targets to define the upward slope of the crawl. See also Roger and Stone (2005).

12. See the CBE's Monetary Policy Statement published in June 2005.
13. Given the current liquidity within the market, the overnight interbank rate has remained close to the floor of the corridor.
14. The results are presented in Al-Mashat and Billmeier (2008).
15. The number of banks has declined from fifty-seven in 2004 to thirty-nine in 2007.

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10

The Uncertain Journey towards Inflation Targeting in Tunisia

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10.1 Introduction

The Tunisian authorities have announced that they will liberalise capital flows and move to convertibility of the Tunisian dinar (TND) by 2014 and that they intend to adopt a monetary policy of inflation targeting (IT) when the preconditions for it are met.[1] The Tunisian government has also continued to confirm that the goal of its monetary policy is to ensure price stability and to strengthen its reliance on market forces,[2] which is essential for the implementation of IT.

The history of monetary policy in Tunisia since its inception (in the early 1960s) shows that the Banque Centrale de Tunisie (BCT) has often been concerned about and rather successful with inflation control. But the BCT has not just been concerned with inflation control, it has relied more on tight quantitative control of interest rates, bank reserves, bank credit, the foreign exchange market and capital flows than on market forces. Obviously, the use of tight quantitative controls is not costless; in the case of Tunisia, it has exacted a high price in terms of the health of monetary policy and the performance of the banks.

To what extent are Tunisia's monetary authorities prepared to abandon quantitative controls, to rely much more on market forces and to undertake the reforms needed to meet the IT preconditions? Will they or not, in the coming years, shift to exchange rate flexibility, as announced, and undertake the reforms needed to strengthen the financial system and to meet sooner or later all the institutional conditions for IT? But, in any case, why IT? Is there not a more credible and appropriate alternative for Tunisia?

This chapter addresses this set of questions; the purpose is first to understand why Tunisian policymakers have announced their interest

in IT and then to provide an assessment of the probability that they will actually switch to it. In order to provide insights into this probability, the history of Tunisia's financial system and the fiscal and monetary policies adopted since the early 1960s are examined with a focus on the current dynamics. Our hypothesis is that the government is more likely to maintain a flexible and hybrid framework. It will keep targeting not only price stability but also the exchange rate and perhaps real output and, instead of relying exclusively on the interest rate, will keep using other available policy instruments. In other words, a strategy of a sort of managed float with multiple targets seems to be more consistent with the current and expected orientation of Tunisian fundamentals, and hence more plausible. Such a flexible regime is even more consistent with the latest trends in monetary theory and policy design. The historical overview indicates that the need and the willingness for a regime change, and more specifically for a move to IT, do not clearly exist at this time in Tunisia.

IT is increasingly popular and has become the monetary policy framework of choice for an increasing number of both developed and developing countries, consistent with mainstream monetary theory. Under IT, price stability is the central bank's single main objective, and the interest rate is its main instrument. However, it is also becoming more and more evident, based on the lessons learned from the 2007–8 financial crisis and the experiences of (implicit or explicit) IT countries, that the central banks of these countries have not always targeted exclusively the inflation rate and have not always relied exclusively on interest rates. Many financial institutions in many developed countries would have collapsed without the quantitative interventions undertaken by their central banks, including massive infusions of freshly created money.

Although, according to many assessments, IT is credited with achieving lower inflation with no (extra) loss in terms of growth and employment (Freedman, 2006; International Monetary Fund, 2005, 2006; Roger, 2010; Schmidt-Hebbel, 2010), the debate is not yet over and many new voices are advocating more flexible or hybrid frameworks (Dai, 2010; García et al., 2009), which would allow for more weight to be given to other targets. More specifically, a consensus is building in favour of making the central bank responsible (or at least partly responsible) for financial stability in addition to price stability, which would require using more instruments. These new developments are likely to push the Tunisian authorities away from IT.

The chapter is organised as follows. After this introduction, Section 10.2 examines the conduct of Tunisian monetary policy since the early

1960s, with a detailed review of policy tools and issues in the most recent decade. The purpose is to understand Tunisia's gradual transition to a more flexible and more coherent regime and to assess the probability of a further move to IT. Section 10.3 addresses more directly the following question: 'Is the transition to IT credible and is not a more flexible, even hybrid, framework a sounder and more credible option?' This section also tries to learn from past policies elsewhere, and from the ongoing theoretical debate on monetary policy. Section 10.4 concludes.

10.2 Monetary policies in Tunisia: a historical overview

The creation of Tunisia's central bank and of the Tunisian currency dates back to 1958, that is two years after the country's independence from France. This put an end to the short-lived agreement according to which Tunisia would remain in the French franc monetary zone and would become a member of a customs union led by France and including its former colonies. It was evident that political independence was not enough (it did not mean independence from poverty or financial independence) for the newly created Tunisian government, which wanted to show its determination to ensure economic independence and to face major economic development challenges: high unemployment and poverty rates, illiteracy, high expectations by the people of a better standard of living, and a dwindling stock of foreign reserves (which were mostly French francs) due to capital flight. This was the original context of Tunisian macroeconomic and monetary policy.

The initial development strategy was in favour of state planning and state intervention in all sectors and domains, not only in order to provide the public services and infrastructure that were lacking but also to promote new industries and create new enterprises. This strategy had ambitious objectives and projects but was not sustainable. Ten years later, in the early 1970s, major reforms had to be undertaken and more power was conceded to the private sector. However, the true liberalisation process started much later, in 1986, following a balance of payments crisis. With this 1986 regime change a more coherent monetary policy started to emerge but government dominance has persisted. The following brief presentation of monetary policy in Tunisia from a historical perspective shows how the central government, despite the commitments taken, remains reluctant to transfer more power to autonomous agencies such as the central bank.

Fiscal and monetary policies under state development planning: 1960–86

In the early 1960s, the government adopted state economic development planning as a strategy and started preparing long- and medium-term development and investment plans with ambitious goals. During the 1960s, little power was left to market forces and private initiatives. Although private investment was later rehabilitated, the role of the central government and of the public sector would remain predominant and unquestioned until today, but much less so since the late 1980s reforms.

Right after independence, the banking system was composed mainly of subsidiaries of French banks, which were not interested in national plans and in providing medium- and long-term lending to finance economic development projects and new enterprises created by Tunisian nationals, nor in the savings and investments of small enterprises belonging to Tunisian artisans and farmers. Consequently, the Tunisian government decided to take control of the banking and financial sector and to create national banks, mainly the two large universal banks (Société Tunisienne de Banque, STB, and Banque Nationale Agricole, BNA) but also an investment bank. These banks' capital was provided primarily by the government. Moreover, the former private French-owned banking institutions were restructured. For instance, one Tunisian bank (Banque de Tunisie) controlled by French banks absorbed the subsidiary of another French bank (Société Générale). Another subsidiary of a French bank merged with another small bank to form a new Tunisian bank (Union Internationale de Banques, UIB) in which the Tunisian government retained majority control and invited other foreign banks to take minority participation.

This extensive reform allowed the Tunisian government to gain complete control of the banking system as early as 1964. More than 80% of deposits were held by the government-controlled banks, and it was established that the primary objective of these newly created banks, especially the large national public ones, was to serve the government's development plans and to promote investment in priority sectors: manufacturing and major industrial projects, agriculture and, later, tourism. All loans, except for small ones, had to obtain BCT approval (Bistolfi, 1967: 311). The BCT also had a monopoly on the management of foreign currency. The BCT was invested with the powers of supervision and regulation of the banking system, but with no precisely stated monetary policy. The 1958 law (Tunisian law 58–90 of 1958) that created the BCT assigned to it two goals: control of the circulation of money, and

control and distribution of credit. These objectives were meant to be vague enough to accommodate the government's investment plan and to support its economic policy.[3]

The government intended initially to rely substantially for its financial needs on foreign aid but foreign governments' and international institutions' actual contributions were less than 30% of the total investments envisaged by the first development plans, well below the 58% projected. As a result, in order to implement the planned projects, domestic bank credit and money creation were increased at a fast rate. The treasury then had to borrow heavily from the BCT in various ways in order to pay for its investment expenditures (Bistolfi, 1997: 308–9). The government also instructed the BCT to issue bank regulations forcing all banks to invest 20% to 25% of their resources in government long-term bonds (*bons d'équipement*); it was then able to use the powers of the BCT to direct credits to the priority sectors specified in its economic plan. This would continue until the end of the 1980s.

Between 1960 and 1964, this lax lending supervision and the eagerness of the government to achieve its investment objectives caused a rapid expansion of credit and money supply and consequently rising inflation and a balance of payments problem.

Given this strong inflationary pressure and the lack of appropriate supervision of the banking system and its modus operandi, the increase in the discount rate decided by the BCT in 1964 did little to slow down credit and money creation. The BCT then used its power to control the volume and distribution of credit. The government also decided to extend price controls to all products and to wages. This was the beginning of the policy of widespread price and wage controls, which would remain in effect until the late 1980s and, partly, up to the present day. Thanks to this policy, the inflationary pressure was suppressed, but the foreign trade imbalance and the lack of foreign currency reserves remained.

Consequently, in September 1964, the government had to face its first balance of payments crisis and had to devalue the TND (by 20%). It also scaled down selectively some of its investment programmes (mainly in housing and infrastructure) and made a commitment to reduce its overall deficit and no longer to resort to money creation to finance its deficit. On the banking side, the required reserve ratio was raised to 10% of all deposits, and banks also had to invest 10% of their deposits in medium-term credits. This is how, as early as the mid-1960s, inflation control was de facto introduced and the BCT started acquiring the instinct to care about price stability, but in a very loose sense and relying mainly on quantitative controls.

Although no banking law was legislated until 2001 and monetary policy did not have clear goals, inflation control did matter for the BCT and for the government. This would be more explicitly stated in the sixth national development plan (1982–6), which specified that the government planned to contain the money supply growth rate within limits compatible with the growth rate of real GDP in such a way as to avoid the build-up of inflationary pressures.[4]

However, between 1972 and 1987 the real discount rates on loans to priority or non-priority sectors, including exporting enterprises, were most of the time negative. Obviously, these negative rates created a high demand for loans and maintained a pressure on the BCT to expand the money supply rapidly.[5] It is precisely during the period 1972–86 that the money supply growth rate and inflation reached their peaks.

To deal with these distortions, the BCT had continued to use its authority to control the amount and distribution of credit. It was also decided that every bank must invest 20% of its deposits in long-term government bonds (*bons d'équipement*), 12% in private medium-term securities and 2% in loans to a government-owned financial institution that financed housing investment.[6]

Borrowers not only enjoyed low or negative interest rates but also had incentives to default on their loans: contract enforcement was not imposed on them, and the rights of the banks were not protected by the judiciary. In a sense, banks had to provide the funds required by the government and to finance firms investing in the priority sectors and, in return, their management would not be accountable for failure to screen out risky and low-return projects, as long as they acted according to the national plan and government directives. In a sense, the BCT's quantitative control of credits was not designed to act against poor management and to reject bad loans.[7] As a result, a lot of loans in all sectors went unpaid and banks had to write them off, which ultimately had to be covered by the BCT. The government finally admitted in the early 1980s (in the sixth plan) that the direct and continuous intervention in the credit market represented a heavy burden on the human and financial resources of the BCT.[8] It promised to enact prudential rules that banks must follow to improve the performance of their loans and solve the problem of forced lending. However, the government reaction was rather late; soon afterwards, at the end of 1985, the country faced its second balance of payments crisis.

By 1986, despite price and wage controls, the pro-growth policy followed by the government and by the BCT since its inception had consistently led not only to a high money supply growth rate and

inflation but also to high national foreign debt and external imbalance. The BCT's credit to the economy had increased 28 times between 1971 and 1986, from TND 30 million to TND 850 million, that is at an annual compound rate of 25%. As Figure 10.1 shows, the growth rate of real GDP was also fairly high but unstable. This state of affairs was partly the result of the negative BCT real discount rate. Given a fixed exchange rate between Tunisia and its main trading partners, the higher domestic inflation rate (Figure 10.2) hurt the competitiveness of Tunisian exports. It also increased pressures on imports and the interest rates on borrowing from international financial markets.

We may conclude that, over the period 1960–86, in trying to comply with the government's growth policy, the BCT allowed the demand for loans to drive the growth of money supply, output and prices upwards, but whenever inflation threatened to get out of control the BCT clamped down on the money supply growth rate, reversing some of the inflation surge but also some of the output gains. That is, this policy generated a cycle involving periods of high nominal and real instability.

Reforms and liberalisation, Phase 1: 1986–2006

In 1986, the government had no choice but to implement a stabilisation programme and a series of reforms in agreement with the World Bank and the IMF, in order to regain domestic and external macroeconomic

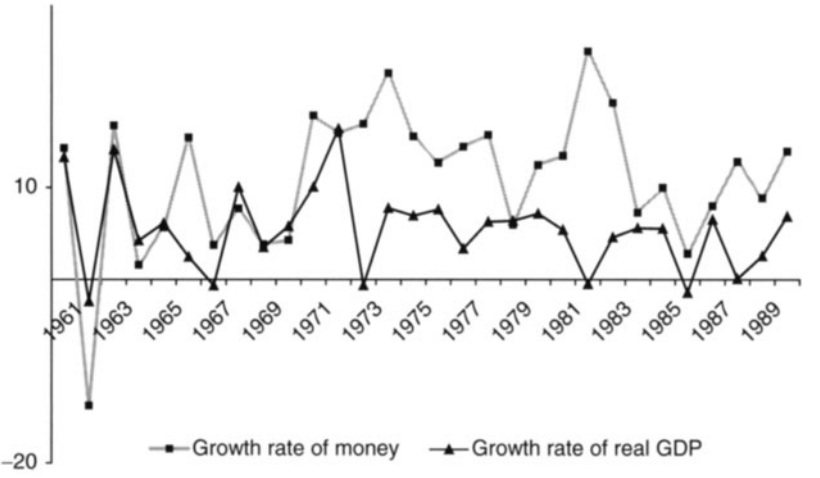

Figure 10.1 Money and output 1961–90

Source: International Financial Statistics, various issues.

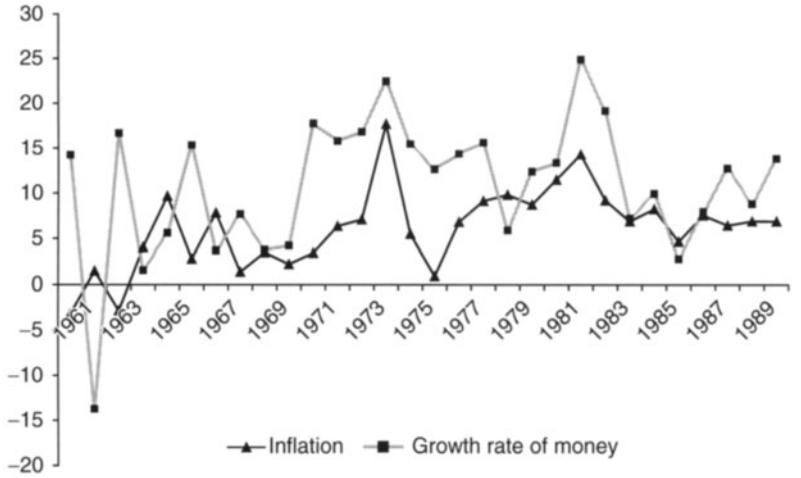

Figure 10.2 Money and inflation 1961–90
Source: International Financial Statistics, various issues.

stability and to contain inflationary pressures. The devaluation of the dinar was the first major action, followed by a series of reforms emphasising, in principle, the shift from direct control of credit (and also of investments, trade, and prices) to control through interest rates, and more generally the shift to less state planning and more reliance on market forces. In practice, this process was slow, especially in the financial and monetary area. As illustrated in Figure 10.3, interest rates were adjusted and, in the late eighties, the real discount rate on credit granted to priority sectors became slightly positive; long-term interest rates and some short- and medium-term interest rates were liberalised but other interest rates were not and a large number of interest rates remained strictly controlled by the BCT. The BCT continued to fix short- and medium-term interest rates on credit granted to the so-called priority sectors, such as agriculture, exports, and small and medium-sized enterprises (SMEs). Furthermore, all credits granted to these sectors could be automatically rediscounted at the BCT. As most credit is short- and medium-term, liberalising long-term rates had little impact.[9] Despite the proclaimed aim of the reform – to allow market forces to determine interest rates and the volume and distribution of credit – in practice the BCT continued to control the distribution and volume of credits, but less strictly than in the previous period.

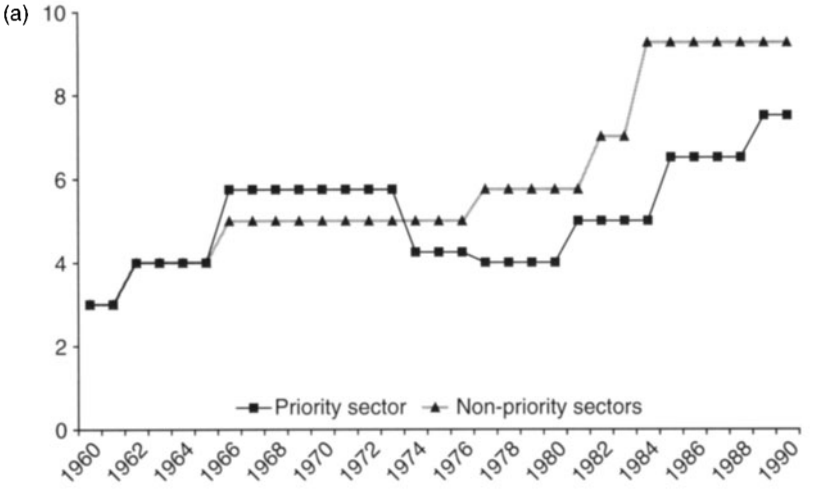

Figure 10.3a BCT nominal discount rates 1961–90

Source: International Financial Statistics, various issues.

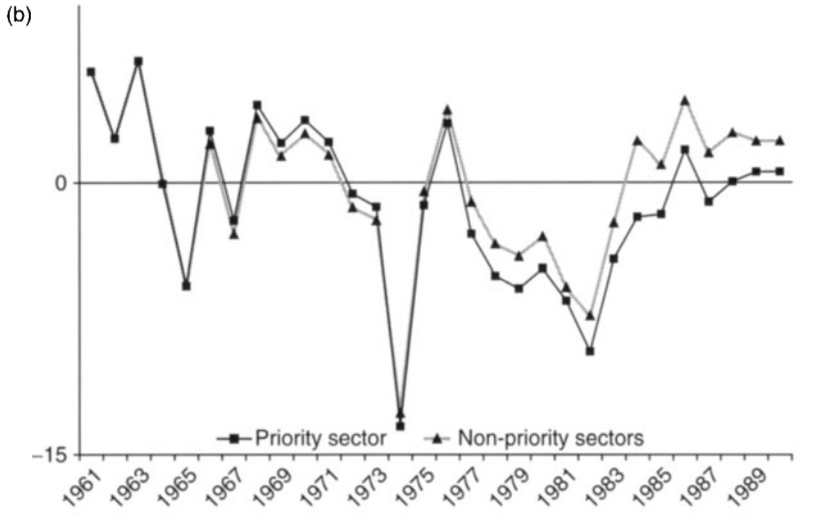

Figure 10.3b BCT real discount rates 1961–90

Source: International Financial Statistics, various issues, and authors' calculations (real rate = nominal rate – actual inflation rate).

However, in the spirit of the financial liberalisation policy, the requirement for prior approval of loans was lifted, and the maximum credit a bank could make to a single borrower without the approval of the BCT was raised from TND 1 million to TND 10 million. The maximum credit that a bank could discount without authorisation of the BCT was also raised, from TND 100,000 to TND 200,000. On the other hand, the maximum a bank could access through discounting during a given year was reduced from 17% to 13.5% of deposits. As a result, total BCT credit to the economy decreased from TND 850 million in 1986 to TND 587 million in 1990.

The third component of the reform was the activation of the interbank money market, which helped the BCT indirectly control the volume of credit by controlling the liquidity in the banking system. Furthermore, banks were now required to hold 20% of their assets in government long-term bonds, 18% in medium-term loans to the private sector and 2% in loans to the construction sector.[10]

The seventh plan (1987–91) invested the BCT with the responsibility of ensuring that the distribution of credit was consistent with the investment priorities established in the plan. As a consequence, agriculture, food processing industries and industries transforming local natural resources retained the privilege of direct access to the BCT discount window. This implies that the BCT provided free insurance against bank failures and therefore continued to control the volume as well as the distribution of credit. To help the BCT in its new mission of liquidity supply, the government endowed it with two new instruments, the *appel d'offre* and the *prise de pension*, two procedures borrowed from the French system.

The *appel d'offre* is an auction of funds made available by the BCT on the basis of the liquidity needs of the banking system. On Friday, the BCT announces the amount of funds to be auctioned, the banks respond on Monday, and on Tuesday they receive the funds. The loan is extended for seven days. There are three methods of allocating the auctioned funds. The first method allows for multiple interest rates. Starting with those banks offering the highest interest rate, each bank's demand is satisfied in the descending order of the interest rate offered until the amount of the funds to be auctioned is exhausted. The second method allows for a unique interest rate. All loan applications offering an interest rate higher than (or equal to) the policy rate fixed by the BCT obtain funds proportional to the amount of the application. The third method is a mixture of the two. All methods require collateral in the form of credit bills or treasury bills determined by the BCT.

The second instrument, the *prise de pension*, is really a discount window that allows banks to borrow reserves for seven days at an interest rate fixed by the BCT. This interest rate is higher than the interest rate fixed in the market for *appels d'offre*. The margin between the two interest rates is determined by the BCT depending on the liquidity of the market. Again, the BCT determined not only the interest rate but also the amount and distribution of the credit it granted to the banks through the *prise de pension*.

This does not mean that inflation did not matter. In fact, during this period, a gradual but clear shift in policy towards inflation control was implemented. BCT credit to the economy levelled off in 1987, for the first time ever, and even declined in the following few years. In 1989, for the first time, inflation control started to appear more explicitly as a goal of monetary policy in BCT Annual Reports.

In the seventh plan (1987–91), the government laid down the principles of new monetary and fiscal policies in order to control inflation and reduce its debt. In 1986, the government had committed itself to reducing the growth rates of its operational expenditures, excluding debt service (Titre I of the budget) and its capital expenditures (Titre II), to 3.8% over the period 1987–91, compared with 17% in the previous period.[11]

Henceforth, the BCT had to maintain the growth rate of money supply M_2 at 10% in order to maintain the M_2-to-GDP ratio at or below 44.5%, and the government's economic development plan required the BCT to make sure that the growth rate of credit matched the growth rate of the economy. The monetary policy was better focused and there were now specific targets for M_1 and M_2 and for credit. Nevertheless, the banking system still had to provide long- and medium-term credit and/or acquire interest in non-financial institutions for a total of 26.5% of the value of the investment programme specified in the seventh plan of economic and social development.

This means that despite the improvement in the design of monetary policy, the managers of some financial institutions remained unaccountable and did not have to comply with any clear standard in terms of the return on and risk of the investments they were financing. Starting in 1987, banks had to increase their lending to SMEs from 7% to 10% of their deposits. Clearly, the proliferation of such requirements exposed banks to higher risks and encouraged their managers to continue to shift responsibility for non-performing loans (NPLs) to the BCT.[12]

The emphasis on inflation control appeared more clearly in the government's eighth development plan (1992–6). The whole banking

system, not just the central bank, now had to strive to reduce the inflation rate; although no inflation target was explicitly set, the government had in mind an inflation rate of 4% – similar to that of its European trade partners, members of the European Union (EU).[13] Government policymakers recognised in the eighth development plan that, other things being equal, the competiveness of Tunisian products depended on the real exchange rate, for which they had fixed a target as well.

This new emphasis on the real exchange rate and on improvement of the competitiveness of domestic products was consistent with the new trade liberalisation policy and the outward reorientation of the economy.[14] During the same period, price control became much less comprehensive; by 1996, 60% of the prices of products at the retail stage were left to be determined freely in the market. Price control was to be limited to basic products.

Inflation control now had to be achieved by means of reining in government budget deficits, controlling the growth rate of money supply and controlling the growth rate of nominal wages, with the help of a perpetual entente with the single labour union (UGTT) and the employers' union (UTICA). The government also stopped the practice of forcing banks to invest a certain percentage of their deposits in special government bonds and committed itself to financing its deficits henceforth by issuing government bonds of various maturities and to paying the 'market interest rate'. Theoretically, this commitment should have freed monetary policy from fiscal dominance. Having learned from its experience in the previous three decades, in the eighth development plan the government fixed the target growth rate for the monetary aggregate M_2 at 11.1% in order to reduce the money supply-to-GDP ratio from 48% in 1991 to 46% in 1996. In line with IMF doctrine, the eighth development plan declared that the way for the banking system to reduce inflation was to mobilise more resources to finance productive investments and to keep under control the growth rate of the money supply.

In practice, starting in the early 1990s, the BCT predicted or set a target for the real GDP growth rate and the inflation rate, which it used to calculate the growth of nominal GDP. For some reason, it anticipated that the velocity of money would increase at the rate of 2% per year. Accordingly, it set the target growth rate for the monetary aggregate M_2 at 2% below the target growth rate of nominal GDP. The day-to-day procedure of controlling the money supply growth rate was based on competitive tenders for liquidity and credit lines as described above.

It is worth noting that the procedure applied to competitive tenders from the mid-1990s had generally been such that the BCT maintained

the previously applied interest rate and asked banks to specify only their demand for liquidity. Banks were quite dependent on the resources of the BCT, which usually satisfied their demands for liquidity. In this way, the BCT was able to keep interest rates from changing, which amounted to a de facto stabilisation of short-term interest rates, in contradiction with the BCT's claim that interest rates were set freely in the money market.

How successful was the BCT in controlling inflation through money targeting? In practice, the BCT often missed its money target. Figure 10.4 compares the actual and target growth rates of M_2 and shows clearly the gap, which exceeded two percentage points more than 60% of the time and eight percentage points during the years 1988, 1996 and 1999. This suggests that BCT money targeting was not credible (Boughrara, 2006). The main reason for this was that the BCT had to accommodate government budget deficits. Formally, the government was to finance its deficits by selling bonds in the financial market or borrowing at the 'prevailing market rate'. In fact, whenever new bonds were issued, the BCT continued to meet the banks' requests for liquidity indirectly generated by the government deficit. This accommodation operated mainly through a tacit agreement between the BCT and the Ministry of Finance, which has prevailed at least since the mid-1980s, according to which every time the Ministry of Finance decides to issue and sell additional government bonds, the BCT systematically launches a competitive tender for a corresponding additional injection of liquidity in the money market. The point here is not so much to question the existence of a harmonisation procedure, which is to some extent necessary, but that the additional liquidity is large enough for all the banks to get

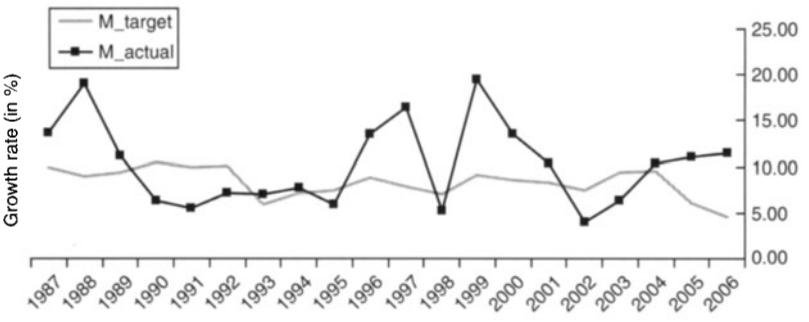

Figure 10.4 Comparison of the BCT target and actual value of the growth rate of M_2

Source: Boughrara, 2006.

the liquidity needed to buy (through their affiliates acting in the financial market) the new government bonds, with no increase in the money market interest rate.

Figure 10.5 shows the rigid relationship that prevailed until 2006 between the BCT policy interest rate (*taux d'appel d'offre* or TAO) and the other two major interest rates, the average money market rate (TMM) and the maximum interest rate on bank overdrafts (TMD).

As Figure 10.6 shows, from the early 1990s, the government and the BCT have been more successful in reducing the inflation rate than in targeting the money supply growth rate. The inflation rate was reduced from a peak value of 14% in 1982 to 4% in 1995 and was maintained between 2% and 4% from 1995 to 2002. This performance was not, however, exclusively the outcome of monetary policy and credit control;

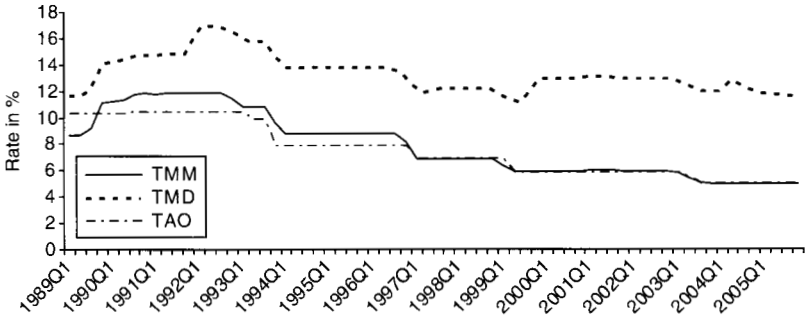

Figure 10.5 Key interest rates in Tunisia 1989–2006
Source: BCT.

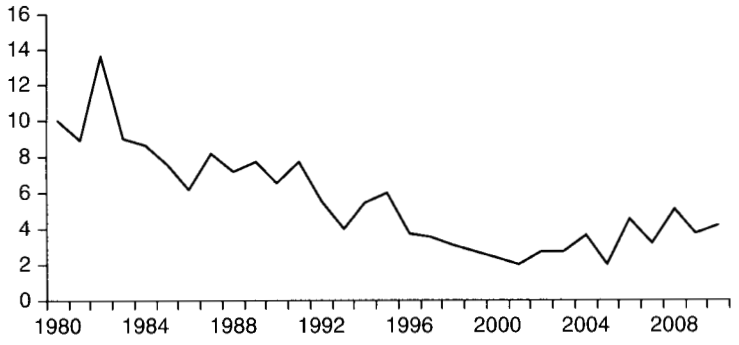

Figure 10.6 Inflation rate, average consumer prices, 1980–2010
Source: http://www.imf.org/external/ns/cs.aspx?id=28.

other factors counted too, namely price control, the reduction of tariffs and the increase of imports, the absence of major terms of trade shocks, and the maintenance of strict capital controls (except for foreign direct investors).

From 1986 to 1995, in spite of the relative fall in the inflation rate, the exchange rate policy of targeting the real exchange rate resulted in a continuous depreciation of the Tunisian dinar. Afterwards, as Figure 10.6 shows, the inflation rate was brought down below 4% and fell as far as 2%; consequently, the nominal exchange rate of the Tunisian dinar against the euro was stabilised but not fixed.

It is clear that the reduction in the inflation rate from the early 1990s to the early 2000s reflected a deliberate monetary policy of inflation control, which helped to stabilise the real exchange rate; but monetary policy was not focusing on price stability only, and a variety of monetary and non-monetary instruments were used to control inflation.

The government planned to remove its control on interest rates and credit through the BCT, to strengthen market forces and to carry on with financial reforms. It encouraged banks to take over some of its role in financing non-traditional ventures,[15] and it promised to finance its budget deficits at market rates. The government was aware of the deteriorating financial condition of the main banks and also of insurance companies, but, since it still owned a majority stake in many of them, it continued to rely on them whenever it underwent financial stress.[16] Many public corporations, some of them with heavy debts, also depended on these public banks, and the government itself guaranteed their debts.

Under these conditions, the banking system remained fragile and it was impossible for the BCT to conduct its monetary policy using only its ability to influence the short-term market nominal interest rates. Actually, the BCT had its hands tied and did not even use its power over short-term interest rates frequently enough for fear that it would increase the government burden and aggravate the financial difficulties of many government enterprises and banks. In effect, it needed the agreement of the government to change its interest rate. This is consistent with the observation that the TMM did not change freely, as shown in Figure 10.5.

The Tunisian government also had important contingent liabilities in the form of arrears during the 1980s and 1990s. The published fiscal deficit is calculated on the cash basis and not on the accrual basis. Thus, only completed transactions are accounted for and arrears do not appear. In some years, these arrears built up and had to be settled

through central bank financing. For instance, between 1996 and 1999, the BCT had to refinance important government arrears, which led to a fast growth of M_2, well beyond its target. More recently, some measures have been taken to deal with this arrears issue and to avoid off-budget transactions. Significant progress has been achieved but the system does not seem totally immunised against this sort of risk yet. Thanks to the fiscal reforms implemented during the 1990s (described above) and to the adoption of more transparent and more market-based debt management instruments, fiscal discipline has been strengthened significantly.

Figure 10.7 shows that the government reduced its overall budget-deficit-to-GDP ratio from 5.5% in 1986 to 3% as early as 2000. Since then, it has maintained its overall budget deficit ratio around 3% and often below. It reduced the tax burden from 25% of GDP in 1990 to 21% in 2000, and reduced its expenditure, excluding interest on debt, from 25% in 1996 to 24% in 2000.

Clearly, public enterprises, many banks and other financial institutions such as insurance companies, and government budget deficits all constituted burdens on monetary policy. This contradictory situation prompted further reforms. The government sought to impose prudential rules on banks to improve their management and their asset portfolios, and to bring them in line with the principles of the Basle Committee on Banking Supervision. It also planned to improve the management of its own enterprises with a view to privatising many of them and cleaning up the insurance sector. More broadly, the increasing international economic integration of the Tunisian economy forced the government to accept deeper change in its strategy.

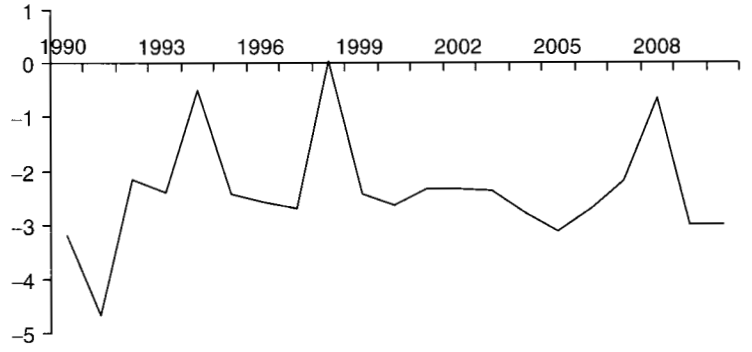

Figure 10.7 Central government fiscal balance 1990–2009 (% of GDP)
Source: IMF Article IV 2010 consultations for Tunisia, and World Bank indicators.

The progress to more coherent macroeconomic policies was gradual and was accelerated by a series of impulses. Trade liberalisation, the implementation of the free trade agreement with the EU and the new mainstream wisdom in terms of monetary policy – notably the principles advocated by the International Monetary Fund – led the government to assign less ambiguous goals for its monetary, fiscal and exchange rate policies.

In early 2002, the government amended the law that created the BCT and added a new article 33, which stated that the general mission of the BCT was to defend the value of the domestic currency and to ensure its stability. This was one step in an ongoing process.

10.3 Moving towards inflation targeting or away from it?

In 2006, the government amended this same article 33 to assign more explicitly to the BCT, as its primary objective, the responsibility for maintaining price stability, and it removed previous explicit references to exercising direct quantitative control over credit and its distribution. The tenth development plan (2003–7) made the notion of price stability clearer by setting a goal of 3% for the inflation rate, but this target was not well defined and the BCT did not commit itself to it. Shortly afterwards, the BCT published a much more far-reaching statement to the effect that Tunisia would adopt an IT framework as soon as the preconditions for it were met. This section is about these IT preconditions.

The decision was consistent with Tunisia's previous reforms and anti-inflation policy and also with the authorities' willingness to be among the first to set up modern institutions, but it was also clearly admitted that Tunisia was not ready for IT and that its government had not expressed an unambiguous determination and commitment to move to it. It is true that some reforms have been implemented consistently with IT, notably in the financial and fiscal domain, but no transition plan and no time frame have been defined, and not enough has been done to remove the uncertainty surrounding the future monetary policy agenda. Serious doubts remain with respect to the government's willingness to fulfil some of the main conditions for IT concerning the soundness of the financial system, the institutional framework and the transition to exchange rate flexibility and capital account liberalisation.

Financial reforms and financial soundness

The first condition for a successful transition to IT is to have a sound financial system and fiscal policy.

a) The financial system

In Tunisia, the securities markets are still small and securities constitute only a small portion of the assets in the financial system. Despite a sharp increase in the volume of trading and capitalisation since the implementation of the 1989 and 1994 reforms, market capitalisation represented only 8.8% of GDP in 2007, while the annual value of trading amounted to only 1% of GDP, which was low in comparison with other emerging markets. Moreover, the bond market is dominated by government securities, which represent over 85% of the outstanding bond instruments, and the secondary market is in its infancy. Finally, non-bank financial institutions (insurance companies, pension funds, collective investment institutions and investment companies) play a relatively small role in the Tunisian economy. Their assets represent only 22% of GDP.

Banks dominate the Tunisian financial system. Since most banks were government created and owned, the government continues to appoint directly or indirectly the top officials of most of them. These officials are expected to follow government objectives and directives. Consequently, they lack the incentive for good governance and are encouraged to take excessive risks, which make the system even more fragile.

The banking system, currently composed mainly of twenty-one commercial banks and eight offshore banks, remains the backbone of the Tunisian financial system. A few European banks have majority control of some of the recently privatised banks. The eleven largest banks, each of which has total assets greater than half a million Tunisian dinars, accounted in 2007 for 93% of the total assets of all banks. The three largest are state controlled and dominate the banking sector with 40% of all bank assets in 2007.

However, in compliance with the principles of the Basel Committee on Banking Supervision and under pressure from the IMF and the World Bank, many reforms have been implemented to change and modernise the Tunisian financial system. A banking law passed in 2001 introduced prudential rules that a bank's management must observe. The government has privatised many of its financial (and non-financial) enterprises, including banks, but it has maintained majority control in the three largest banks along with the power to influence the functioning of the private banks, including the more recently created ones.

Banks are no longer required to invest various proportions of their deposits in support of economic development; this has changed radically. The new legislation removed most of the previous qualitative and

quantitative restrictions on bank lending. However, not all Basel II principles are yet satisfied. The BCT has announced that it is implementing a plan over the years 2009 and 2010 in order to comply with Basel II more fully.

The BCT is legally entitled to obtain any information about any aspect of the financial situation of any credit institution. It can request any credit institution to provide it with information on any of its activities or its financial position, and can also demand to examine the books of any credit institution on the spot and audit any bank.

However, this did not prevent banks from accumulating non-performing loans without adequate provisions. In fact, both private and public banks have high ratios of NPLs (see Table 10.1 and Figure 10.8). Obviously, the BCT has not been using all its legal powers and instruments to enforce prudential rules in order to avoid such a performance.

Nevertheless, as the IMF article IV consultation reports confirm, the government has been clearly aware of the seriousness of the NPLs problem. Consequently, actions have been taken by the government, including accepting responsibility for a share of the non-performing loans to

Table 10.1 Banking system profitability and solvency indicators

	2003	2004	2005	2006	2007	2008	2009
Solvency ratio	9.3	11.6	12.4	11.8	11.6	11.7	12.4
Private banks	8.4	12.4	13.5	12.1	9.7	11	11.6
Public banks	10.8	10.1	10.0	9.3	9.9	9.6	10.9
Former development banks	54.3	55.3	50.3	46	38.5	36.2	31.6
Non-performing loans (% of total liabilities)	**24.2**	**23.6**	**20.9**	**19.3**	**17.6**	**15.5**	**13.2**
Private banks	21.6	20.4	20.0	19.0	18.1	15.3	12.5
Public banks	26.7	27.4	22.1	19.7	17.3	15.9	14.1
Former development banks	29.6	21.5	21.0	19.6	16.0	15.0	12.7
Provisions (% of NPLs)	**44.1**	**45.1**	**46.8**	**49.0**	**53.2**	**56.8**	**58.3**
Private banks	39.9	43.5	45.9	48.4	52.0	55.0	59.2
Public banks	46.2	47.6	49.1	50.2	55.0	58.1	57.1
Former development banks	62.3	23	28.5	42.9	48.1	63.1	60.2
Return on assets	0.5	0.5	0.6	0.7	0.9	1.0	1.1
Return on equity	4.6	4.8	5.9	7.0	10.1	11.2	11.9

Source: IMF Tunisia 2009 and 2010 Article IV Consultations.

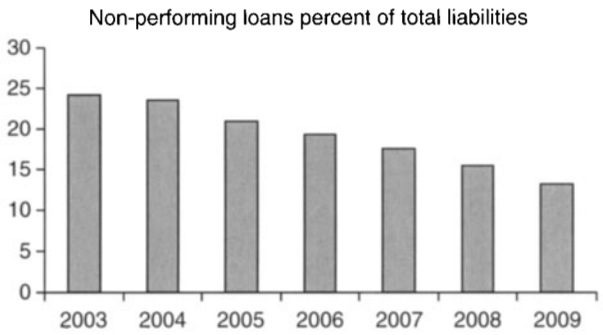

Figure 10.8 Non-performing loans in Tunisia
Source: BCT, http://www.bct.gov.tn/bct/siteprod/english/politique/index.jsp.

government-owned enterprises, creating institutions to take over the NPLs of banks, and making a significant effort in terms of risk management and improvement of the banking information system. These actions explain the significant reduction in the rate of NPLs held by banks to 13.2% in 2009.

Despite this progress, the financial system remains rather shallow and fragile, and more needs to be done in order to prepare it for a policy based on market forces and IT.

b) Fiscal policy

One of the important steps taken by the government of Canada when it decided to adopt IT, as in many other IT countries, was to commit itself to turn its budget deficits into budget surpluses in order to produce a cyclically balanced budget and to reduce its debt-to-GDP ratio to 40%. An important reason for this commitment was to convince economic agents to anchor their expected inflation rate at the target inflation rate assigned to the central bank, since monetary policy was going to be totally free from fiscal pressure. When a government runs a high budget deficit relative to its GDP, it may be tempted either to convince banks to lend it more, which may lead the central bank to provide it with extra liquidity and create more money in order to prevent the government from defaulting, or to solicit directly the money from the central bank. This was the case in Turkey in the 1990s and in Tunisia during the period 1960–2000, as well as in many other countries all over the world. The recent Greek crisis, which caused a depreciation of the euro and shook the credibility of the European Monetary Union (EMU), is another example and confirms once again that high and

persistent budget deficit and debt ratios are a threat to the independence of monetary policy.

The fiscal policy of the Tunisian government and its performance during the recent past seem to be more encouraging. The data show that the overall government budget deficit has decreased further since 2006, from 3.8% of GDP in 1998 to 2.9% in 2007[17] – a reduction achieved despite the significant loss of income from customs duties due to the implementation of the free trade agreement between Tunisia and the EU. This improvement led to an increasing primary budget surplus (defined as the difference between government total revenues, excluding foreign aid and the proceeds of privatisation, and government expenditures excluding debt service).

Clearly the debt-to-GDP ratio should fall due to the high growth rate of real GDP compared with the average real interest rate on its debt. A high growth rate of real GDP also contributes to a fall in the debt-to-GDP ratio by helping tax revenues to grow faster. The debt-to-GDP ratio will continue to fall if the interest rate does not increase, expenditures remain under control and the Tunisian economy can maintain a relatively high growth rate of real GDP. The government can then maintain a ratio of overall budget deficit (not including interest charges) to debt of below 3%. A falling debt-to-GDP ratio improves the credit rating of the Tunisian government's debt, which enables it to borrow at lower interest rates, which reduces the debt-to-GDP ratio further. A falling GDP ratio is a virtuous circle that would help the Tunisian government avoid a financial crisis and/or inflationary spiral. The government's objective is to reduce public debt to 40% of GDP by 2014 – an ambitious yet achievable objective.

Owing to the government's recent fiscal reforms, it seems that non-fiscal dominance, a major condition for the success of IT in any country, basically applies in Tunisia. There is currently no serious risk that fiscal policy will cripple monetary policy and prevent it from gaining enough independence to focus on inflation control, anchor expectations, stabilise the nominal interest rate and the nominal exchange rate, and thus attract foreign direct investment. Thus, fiscal dominance no longer explains the cyclical behaviour of the inflation rate, as a comparison of Figures 10.7 and 10.9 shows.

Institutional challenges and uncertainty about financial liberalisation

The lack of transparency and the absence of an irrevocable commitment to IT constitute an important source of uncertainty about Tunisia's monetary policy.

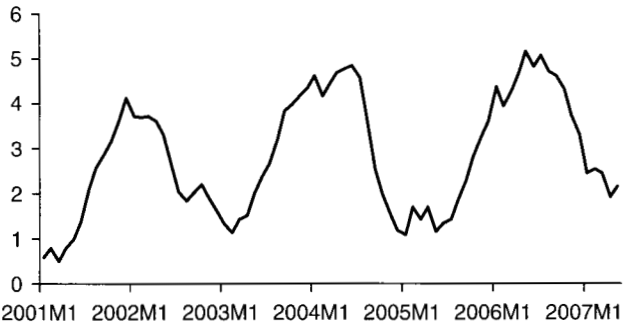

Figure 10.9 Inflation rate, consumer price index, 2001–7
Source: Statistiques Financières, BCT.

The BCT's current monetary policy reveals that it is simultaneously facing in opposite directions: towards IT and away from it. Commitment to IT, or to any other framework, cannot be confirmed simply by statements issued by the central bank or in other official documents. It is essential to build support for it within the country and among government and non-government institutions. What is noticeable in the case of Tunisia is that the debate about IT remains within a small circle, and little information is disseminated about its requirements and consequences. Wide ownership by the government authorities of such a policy choice has not been clearly expressed.

It took a crisis for Turkey to decide to move to IT, and most countries that have adopted it went through severe macroeconomic difficulties before making the same decision. Tunisia undertook significant regime changes, mainly in 1964 and 1986, following periods of balance of payments crisis and severe macroeconomic imbalances. Currently, the situation is expected to remain relatively calm in the medium term, as long as capital flows remain under control, inflation relatively moderate and exchange rate volatility limited. However, if by 2014 the capital account has been liberalised and significantly more exchange rate flexibility allowed, then the country will be more exposed to foreign financial shocks, and the need for a more rigorous monetary regime might become more urgent.

a) Exchange rate flexibility and the fear of floating the exchange and interest rates

The BCT continues to concern itself not only with inflation control but also with maintaining a stable interest rate and a stable exchange rate, mainly in real rather than nominal terms.

The stabilisation of the real exchange rate remains an important objective, and the BCT continues to intervene in the foreign exchange market at a steady pace. It does so while maintaining that it intends to switch in the medium term to a floating exchange rate and to rely on the interest rate as a main instrument. This is a source of uncertainty because no plan seems to have been drawn up in order to gradually reduce this intervention in the exchange market and to prepare for the management of a free float regime.

The BCT also maintains monetary targeting, as it continues to set goals for the growth rate of M_3 (without revealing what actions it takes to correct for differences between the target growth rate and the actual growth rate of M_3). Furthermore, although explicit references to quantitative controls on the volume of credit and its distribution are no longer published, the government reiterated in its development plans the need to establish an appropriate schedule of interest rates to guide the choices of borrowers and savers. In all this, price stability remains in effect a major objective but, as Figure 10.9 shows, the official notion of price stability remains vague in view of the strong recent cyclical behaviour of the inflation rate.

It took the world financial crisis of 2008 and thirty months from the previous change for the BCT to effect a substantive change in the money market interest rate by lowering it by fifty basis points (0.5%) in January 2009, as Figure 10.10 shows. The reduction was not made in anticipation of a fall in the inflation rate; rather, it was meant to counter the negative effects of the fall in exports due to the slowdown of economic activity in the economies of the main countries of the Eurozone.

Even though the fiscal burden is not so constraining, the BCT remains reluctant to change the TMM as required by its own commitment to

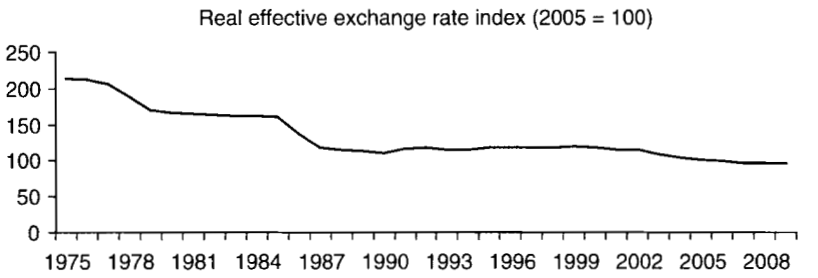

Figure 10.10 Real effective exchange rate 1975–2009

Source: World Bank indicators.

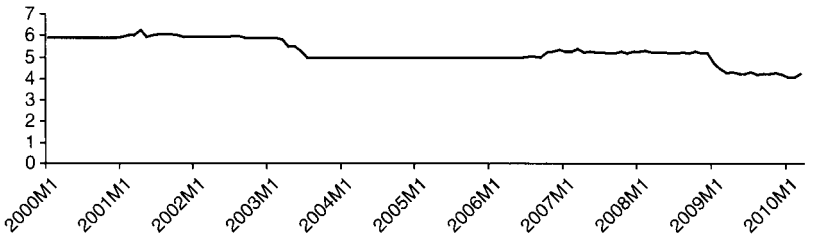

Figure 10.11 Average monthly money market rate (TMM) (%)
Source: BCT.

using market forces in conducting its monetary policy, for fear that this would drive some financial institutions into hardship and create serious debt service problems for the government (Figure 10.11).

b) BCT governance and independence

The ability of a central bank to implement an IT framework, or any market-based monetary policy, depends strongly on the soundness of the country's financial sector. It also depends on its ability to conduct an independent policy. The main pillar of central bank independence is its ability to choose and use its instruments. As to the targets, they may be decided jointly by the central bank and the government.

There is serious doubt about BCT independence. Its governor, who is responsible for the management of all its affairs, is appointed by government decree. He is assisted by a council composed of nine members, who are also appointed by the government. Six of the council members, including the governor himself and the vice-governors, are government officers. The other four are chosen according to their professional experience but again by the government. The composition of the board clearly gives the government a monopoly power over decision-making. Given this institutional and governance framework, the BCT has only limited autonomy in the choice and use of instruments. In practice, the BCT governor is accountable only to the head of state and behaves as a member of the government. There is only a vague notion of accountability of the BCT to the public and there are no explicit benchmarks to measure the BCT's performance in terms of the achievement of its goals.

There are auditors whose role is to check the accounting practices of the central bank, and the auditor general is empowered to make proposals to the board. Every year, he writes an annual report on the conduct

of the bank's affairs for the minister of finance, but it is so far (as of mid-2010) a routine auditing procedure that provides little information about monetary policy and is insufficient to anchor expectations. Tunisian law requires that the council publishes a statement every month, but the amount of information provided to the public concerning monetary policy in this statement has been limited to some vague comments on financial and monetary aggregates, prices, economic growth and exchange rates. The BCT's decisions about the interest rate, which is rarely adjusted, do not clearly respond to predictable changes in the economic indicators. The BCT does not feel any obligation to be more transparent.

One may argue that this may change and new practices will emerge when IT is adopted. Actually, such a major change is not likely in the medium term. As in many other countries of the region, Tunisia's government and political system are highly centralised, and it is hardly conceivable today that the central bank could be allowed to move outside the government's tight circle. It would be more realistic to design the desired monetary policy under the assumption of limited central bank independence. Under such an assumption, monetary stability and, more generally, the credibility of monetary policy would be contingent mainly on fiscal discipline.

c) Financial liberalisation and integration

The Tunisian authorities are maintaining their commitment to strengthening the money and foreign exchange markets, to allow for greater flexibility of interest rates, and to achieve the convertibility of the Tunisian dinar, the liberalisation of the capital account and more flexibility of the exchange rate by 2014. It is clear that important prerequisites have to be met before these goals can be achieved, notably ensuring the soundness of the financial system, high and sustainable growth and a healthy balance of payments. As explained above, significant progress has been achieved in terms of financial soundness (e.g. lower NPL rates and a plan to comply with Basel II rules and standards) and more actions are scheduled to this end, but a coherent action plan designed to achieve these prerequisites is not yet available.

Actually, the current financial crisis has added even more uncertainty about this and made the government more reluctant to implement radical change in its monetary and exchange rate regime. Because the countries that have been internationally more financially integrated are those most affected by the financial crisis, the Tunisian authorities seem even more persuaded that they ought to be prudent with respect to any

regime change. Hence, they are likely not only to maintain strong safeguards but also to delay the financial liberalisation process they have announced.

Will the strong shocks due to the crisis lead the government to revise more radically its previously announced commitments about financial integration and IT? The BCT has indeed released some messages signalling a likely change of attitude, maybe even a step away from IT. The BCT published in 2010 a new statement about its monetary policy[18] that strongly confirms price stability as its main objective but drops all reference to IT, which was explicit in the previous statement. It also indicates that the current framework is based on a set of aggregates, including money supply and the volume of credit. It emphasises the current effort made by the BCT to strengthen its analytical and forecasting capacities (which is required for the conduct of monetary policy under IT but is not a major precondition), while no further commitments are made with respect to the rest of the IT preconditions.

This statement sounds more realistic and more consistent with the country's institutional set-up, and may reflect a long-term stance instead of defining the current phase on the way to IT. This pragmatic attitude is, after all, not clearly in disagreement with recent and emerging ideas and wisdom regarding monetary policies as a result of the crisis, notably for developing countries.

Lessons from the ongoing theoretical debate on monetary policy: is a more flexible and hybrid framework a sounder solution?

The debate about the need for the central bank to be concerned not only with price stability but also with other objectives – mainly financial and exchange rate stability – is not new, even though for quite a long time mainstream economists have considered it obsolete and have insisted that monetary policy should focus on only one objective, price stability, and use one instrument, the interest rate – which implies that only a flexible exchange rate regime is acceptable. The current crisis is casting doubt on this wisdom. In particular, an interesting recent literature is arguing that 'the reliance on interest rates as the main policy instrument is not sufficient' (Blanchard et al., 2010). A new consensus is building in favour of paying more attention to the financial system and adequately integrating it in a new macroeconomic framework. New models are proposed to this end (see, for instance, Gray et al., 2009). The purpose is to elaborate new approaches to deal with financial crises and to ensure financial stability. Within this framework, more responsibility should then be assigned to the central bank. The crisis has made it

clear that monetary policy may have many targets requiring additional instruments (Blanchard et al., 2010; Pisani-Ferry and Weizsäcker, 2009). Financial regulation and the use of the central bank's role and power as a lender of last resort are possible instruments. Using a model with imperfect money and credit markets, it has been shown (Dai, 2010) that an IT central bank would have a better chance of hitting its target if it used a monetary aggregate along with the interest rate as two independent instruments. Combining monetary targeting and IT can lead to more macroeconomic and price stability.

Tunisia's financial integration in foreign markets is limited and its domestic financial market is rather shallow; consequently, it has not been hard hit by the global financial crisis. The issue for Tunisia is probably that its current regulation provides too much, rather than too little, protection against foreign financial shocks. There is a need for better regulations, and the BCT will have to be involved in their design and implementation. The BCT will have to take into account the state of the financial market and any expected disturbances in its functioning when deciding about its policy, which may lead to a trade-off between price stability and financial stability.

In the case of countries like Tunisia, this trade-off between price stability and exchange rate stability is another challenging issue. In an IT framework, strictly speaking, the price level should be the only nominal anchor and there is no room for any second nominal target, including the exchange rate. Given the financial risks due to financial globalisation, some old and some recent research (Faia and Iliopulos, 2010) nevertheless shows that optimally designed monetary policy calls for exchange rate stabilisation, and that a more appropriate policy may require a trade-off between price stability and exchange rate stability. Likewise, using a stochastic dynamic general equilibrium model, García and González (2009) show that the exchange rate must be included in the central bank's policy reaction function.

Stiglitz (2010) takes a broader view when he argues that, because globalisation is likely to cause global contagion and to amplify the negative impact of a crisis that takes place in one country, government intervention is needed to avoid contagion and systemic risk. A well designed system requires circuit breakers to prevent contagion from the failure of one part of the system to other parts. The government should impose temporary capital controls whenever the signs of a crisis and the risk of contagion appear. Full financial integration is thus not optimal. This would also involve central bank responsibility and intervention, and requires an adaptation of the IT framework.

Nevertheless, central bank credibility and accountability, as well as price stability, remain important and have to be reconciled with having more than one objective. Communication and transparency thus become even more crucial for guiding expectations, and may be the basis for a future solution to the accountability and credibility problems.

The Tunisian government is likely to use this type of reasoning to maintain some restrictions in the area of international capital movements and financial integration.

10.4 Conclusion

A review of monetary policy in Tunisia reveals that, although the BCT has been concerned with inflation control since its inception, it has allowed periods of significantly high inflation rates under unsustainable budget deficits and/or excessive government pressures on the banking system to support development programmes. The BCT has extensively used quantitative and administrative controls of interest rates, credit, bank management and supervision, exchange rate, foreign exchange market, and capital inflows and outflows, but in recent years it has been moving towards more market-based instruments, and inflation control is becoming more clearly the main goal of monetary policy.

Tunisia undertook significant regime changes, mainly in 1964 and 1986, following periods of balance of payments crisis and severe macroeconomic imbalances. However, overall, we can say that a new economic policy is only now – slowly and gradually – taking shape. Trade liberalisation, along with the entry of Tunisia into a free trade agreement with the EU, required a stable exchange rate and an inflation rate close to that in the EMU, in order for Tunisia to attract foreign direct investment to increase its competitiveness. The government has also been successful in reducing its own deficit and debt burden. However, more remains to be done to strengthen the financial sector and to improve banking supervision and financial stability.

Some important IT preconditions have been met and others are well under way. However, the lack of an irrevocable commitment to IT constitutes an important source of uncertainty about Tunisia's transition to IT. The BCT's current monetary policy reveals that it is simultaneously moving towards IT and away from it. It is likely that the BCT will continue for years to come to concern itself not only with inflation control but also with other objectives, primarily maintaining a stable exchange rate and a stable interest rate. The current situation is rather calm, with inflation relatively under control and a fairly stable exchange rate. The

need for a more solid and rigorous monetary policy will be strongly felt when the capital account is liberalised and more exchange rate flexibility is allowed as announced (by 2014, but this is not certain).

The current crisis is casting doubt on the accepted wisdom and principles that should guide monetary policy, and a growing literature is arguing in favour of more flexible and hybrid regimes. The reliance on a single instrument, the interest rate, as the main policy instrument to target a single main objective, price stability, is no longer sufficient. The Tunisian authorities' preference for a less stringent and more flexible regime is likely to be reinforced by this new way of thinking and of designing monetary policy and the role of the central bank. Given the Tunisian fundamentals, our analysis shows that a flexible and hybrid regime is arguably more appropriate for Tunisia and more consistent with its institutional and political set-up. Nevertheless, price stability remains and should remain a major objective and the need for a coherent regime and more transparency remain essential for the credibility and the effectiveness of the conduct of monetary policy.

Notes

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1. IMF article 4 negotiations, 2009.
2. Eleventh economic development plan (2007–11), Ministry of Economic Development, Government of Tunisia.
3. The statute of the BCT gave it powers to discount securities representing short-term credit to agriculture and other sectors and medium-term credit to develop production or to finance certain types of export. The BCT also had the power to discount government bonds or provide credit to the government for a total amount during a given year not exceeding 5% of government revenues during the previous year. It could also underwrite government bonds without limit.
4. Sixth economic and social development plan, p. 120.
5. Sixth economic and social development plan, pp. 246, 251.
6. This was the Caisse nationale d'épargne logement (CNEL). The government created the CNEL in 1974 and transformed it in 1989 into a government majority-owned bank called the Banque de l'Habitat.
7. Sixth economic and social development plan, p. 250.
8. Sixth economic and social development plan, p. 250
9. The volume of short- and long-term credit in 1990 was TND 1.3 billion, while the volume of long-term credit was TND 0.335 billion, or 20% of total credit.

10. The ratio of the total credit granted to these sectors to the total assets of a bank is called the development ratio.
11. Seventh economic and social development plan, p. 105.
12. Seventh economic and social development plan, pp. 149–55.
13. Eighth development plan, pp. 125–6. See also p. 186.
14. Eighth development plan, pp. 125–6.
15. Eighth development plan, p. 190.
16. Eighth development plan, p. 193.
17. The ratio increased again because of the crisis, as a result of the stimulus package, but it is expected to return to below the 3% level in the medium term, by 2014.
18. http://www.bct.gov.tn/bct/siteprod/english/politique/index.jsp.

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11

The Journey towards Inflation Targeting in Morocco

Lahcen Achy and Adel Boughrara

11.1 Introduction

For more than two decades Morocco has been opening up to trade and to foreign investment and undertaking various reforms, mainly in the monetary and financial area. More recently, the Moroccan monetary authorities have been preparing for the adoption of an inflation targeting (IT) framework and for the transition to a more flexible exchange rate regime.

The purpose of this chapter is to examine the rationale, the soundness and the risks of these recent strategic decisions. To this end, we review the major structural reforms and changes in the banking sector, exchange rate regime and monetary policy that have taken place in Morocco since the 1970s. We provide a tentative evaluation of the policy shifts recorded and explain why policymakers are now moving towards IT, with detailed accounts of the changes that have taken place in the more recent period. The chapter then sets out the legal, regulatory and technical steps that have been taken prior to the introduction of IT and provides an assessment of the changes that have been made or are under way as part of the journey towards IT. Based on the literature on IT pre-requisites, to which the paper refers, we assess the likelihood that Morocco's monetary authorities will effectively introduce IT in the near future.

Special attention is paid to the risk due to business cycle fluctuations and to exogenous shocks. Indeed, coping with the wide business cycle fluctuations characterising the Moroccan economy is a major challenge that the central bank has to face. Morocco is frequently hit by major exogenous shocks, including climate irregularities and price volatility. Thus, under IT, in hard times the central bank would be

likely to come under very strong pressure, and might have to deviate from its target.

The chapter is organised as follows. Section 11.2 presents an overview of Moroccan monetary policy since the 1970s with a focus on the most recent decade. Section 11.3 assesses the extent to which Morocco has the pre-requisites for the transition to IT, and how it has been preparing to move towards IT. Section 11.4 investigates empirically the nature and magnitude of Morocco's business cycle shocks and asymmetries and analyses the risks associated with supply shocks under an IT regime, as economic downturns may force the government to rely more on seigniorage, which could undermine the credibility of IT. Section 11.5 concludes with the main policy implications.

11.2 Historical overview of Morocco's monetary policy

The current policy is the outcome of a gradual process that started four decades ago. Since 1970, Morocco has witnessed four main episodes in its monetary policy in line with the changing economic and financial conditions, corresponding to the periods 1970–82, 1983–95, 1996–2005 and finally the current episode, 2005–10.

Period 1: 1970–82

Monetary policy since Morocco's independence from French domination in 1956 has generally been prudent except for a few short periods. For example, between 1979 and 1984 the rising budget and balance of payments deficit required direct government intervention in monetary policy. External debt (as a percentage of GDP) and debt service (as a percentage of export proceeds) reached alarming levels, and there was a chronic balance of payments deficit throughout the period 1979–84. Economic growth slowed significantly, while inflation and unemployment soared to double-digit levels. As the largest price increases were those in foodstuffs, transport, and housing, the poor were the hardest hit.

Period 2: 1983–95

The magnitude of the financial imbalances led to the exhaustion of the foreign exchange reserves in the early 1980s, and the government of Morocco was obliged, in 1983, to ask for a partial rescheduling of its external debt and to implement a structural adjustment programme (SAP). Supervised and financed by the IMF and the World Bank, this programme was designed to restore the fundamental macroeconomic

balances, and to gradually establish a monetary policy based on market mechanisms. The reform plan had two components: a general stabilisation programme under the supervision of the IMF and a sectoral and structural adjustment programme under the World Bank. The IMF programme, which extended over a period of five years, and which was divided into three eighteen-month duration stand-by arrangements, was aimed primarily at reducing both current account and fiscal deficits from more than 10% to 4% of GDP by 1986. Annual GDP growth targets were set at 3% and the country had to avoid external borrowing in order to prevent further pressure on its internal and external balances. On the other hand, the World Bank programme covered a wider range of sectors and had as one of its primary objectives to liberalise prices and eliminate price subsidies, including those in the area of interest rates. Trade liberalisation was also on the World Bank's agenda, which hastened the devaluation of the Moroccan dirham.

As far as monetary policy is concerned, Morocco has always been keen to curb inflation. To this end, a target for annual growth in the money supply was fixed by the monetary authorities (Table 11.1). This resulted in a monetary discipline sustained by the fact that the government limited its reliance on special advances from the central bank. Moreover, the Public Treasury financed its needs exclusively from domestic market

Table 11.1 Selected macroeconomic indicators (before reform) %

Year	GDP growth rate	Inflation rate	Monetary growth (M2)	M2 target	Budget deficit[a]
1983	−0.6	6.21	17.7	n.a	−7.8
1984	4.3	12.45	10.2	n.a	−6.0
1985	6.3	7.73	13.2	n.a	−7.3
1986	8.3	8.73	16.9	16	−7.7
1987	−2.5	2.70	9.9	10	−4.5
1988	10.4	2.37	15.2	13	−3.2
1989	2.4	3.14	12.2	11	−5.1
1990	4.0	6.91	21.5	10	−2.2
1991	6.9	7.99	16.8	7	−2.1
1992	−4.0	5.74	9.3	6	−1.4
1993	−1.0	5.2	8.7	8.2	−2.61
1994	10.4	5.1	10.2	8	−3.19
1995	−6.6	6.1	7	5	−4.39

Source: Authors' computation from the World Bank Indicators database (2001) and various issues of the Bank Al-Maghrib report.

Note: [a] % of GDP.

sources. Overall, monetary policy was decisive in controlling inflation in Morocco and keeping the value of the dirham relatively stable. The monetary authorities succeeded to a large extent in keeping the money supply under control except in 1990 and 1991, when the gaps between the targeted and the effective rates were significant. The widening of the gap was mainly due to the effect of the phasing out in 1990 of the credit ceiling system.

During this episode, the hierarchy of objectives of monetary policy was reversed, giving priority to restoring fundamental macro balances rather than growth. Structural financial reforms were not the first priority either. The primary role of the financial sector at this time was to respond to the financing needs of the government and of public sector enterprises, as well as to grant credit at preferential rates to government-defined priority sectors. Credit to the private economy was tightly controlled by the government through the central bank. Monetary policy was subjected to the government's needs through mandatory holdings of government securities by banks and other financial institutions.[1]

Period 3: 1995–2005

In 1993, the financial sector was incorporated into the adjustment process and interest rate and credit liberalisation were integrated into the main reform programme. The monetary authority therefore lifted the credit restrictions and adopted indirect control instruments, and the role of monetary policy was reshaped. Economic growth became the government's priority concern. Monetary policy sought to ensure that the productive sector enjoyed adequate funding.

The central bank (the Bank Al-Maghrib, BAM) reformed its monetary policy framework in June 1995. The purpose of the reform was to provide the BAM with market-based tools to manage liquidity, and by doing so limit inflation risks. Monetary policy itself is aimed at maintaining price and nominal exchange rate stability. Hence, more than one objective is pursued; this is done through an informal quantitative framework, using indirect instruments (Figure 11.1). The BAM started to target M3 instead of M2.

During 2001–4, the country witnessed a surge of liquidity brought about by an exceptional growth in foreign reserves, which resulted in an almost 50% growth of the money supply. The liquidity management of the BAM proved to be inadequate, as available monetary policy tools set out in 1995 were focused on preventing liquidity shortages rather than addressing situations of excess cash on the money market. Banks that needed to adjust their liquidity position to face unforeseen fluctuations

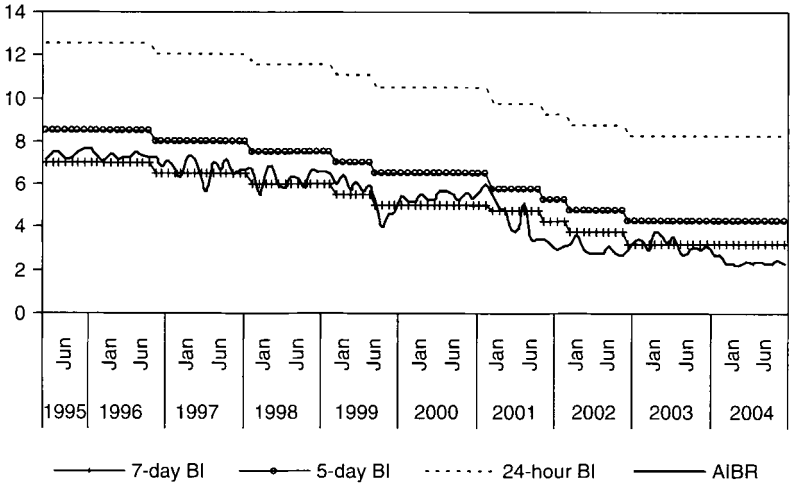

Figure 11.1 Central bank intervention (BI) rates and average interbank rate (AIBR)
Source: Bank Al-Maghrib Report, various issues.

Table 11.2 Selected macroeconomic indicators (after reform) %

Year	GDP growth rate	Inflation rate	Monetary growth (M3)	Credit to private sector[a]	Budget deficit[a]
1995	−6,6	6,1	7,0	45.7	−4,39
1996	12,2	3,0	6,6	44.4	−3,01
1997	−2,2	0,9	16,2	47.5	−3,4
1998	6,8	2,9	6,0	48.7	−2,5
1999	−0,7	0,7	10,2	53.1	−4,3
2000	0,9	1,9	8,4	57.7	−6,5
2001	6.3	0.62	14.2	54.5	−5.3
2002	3.2	2.8	6.3	54.4	−4.3
2003	6.1	1.2	8.7	55.9	−3.3
2004	5.2	1.5	7.8	56.7	−3.0
2005	2.4	1.0	14.0	62.1	−4.0

Source: Authors' computation from the World Bank Indicators database (2001) and various issues of the Bank Al-Maghrib report.
Note: [a] % of GDP.

were penalised through the very high interest rate applied to overnight central bank lending. This rate was 500 and 400 basis points above the repo and repurchase rates, respectively. As a consequence, banks tended to rely more on the interbank money market. For instance, interbank interest rates were permanently below the central bank policy rate over

the period 2001–4 (Figure 11.1) while normally, in an appropriately designed system, the interbank rates should be located between the central bank policy rates (repo and repurchase rates), and this hampered the operation of the monetary transmission mechanism.[2]

During this period, Morocco was pursuing a fixed exchange rate policy, with the dirham pegged to a currency 'basket', whose composition was revised in 2001 by limiting it to two prominent international currencies, namely the euro and the dollar. The respective weights of each currency are no longer kept secret; the BAM stated publicly that the weights were 80% for the euro and 20% for the US dollar (USD).[3] The Moroccan authorities also announced in March 2006 that a more flexible exchange rate regime (a crawling peg) would be introduced by 2010, but the question remained open as to whether this deadline would be met, particularly in the light of the unsettled international environment. By and large, Morocco succeeded in implementing tight demand management policies to contain the rise in prices of non-tradable products. The capital account restrictions allowed the authorities to maintain a pegged exchange rate in combination with an independent monetary policy. Monetary policy was also constrained by current fiscal policy. Fiscal dominance is not at present a serious concern because of the proceeds from privatisation, but the structural fiscal deficit may become a serious challenge in the near future.

The package of monetary policy tools introduced in 1995 was skewed toward the central bank as a 'liquidity provider' and no regular instruments were established to allow the central bank to fulfil its role as a 'liquidity absorber' in case of excess cash on the money market. Moreover, banks that needed to adjust their liquidity position through overnight operations were penalised. Moreover, no overnight deposit instrument was offered by the central bank for banks with excess liquidity. On another front, the excess liquidity had brought about a significant increase in non-performing loans (NPLs) (Table 11.3), although

Table 11.3 Non-performing loans of Moroccan banks[a]

	2000	2001	2002	2003	2004	2005
Banking system	17.5	16.8	17.4	18.1	19.4	15.7
Specialised banks	36	34.8	37	38.5	43	39
Commercial banks	11.4	10.3	12	13	13.8	9
Provision[b]	47.8	52.9	54.7	54.9	59.3	58.6

Notes: [a] in percent of gross assets; [b] in percent of NPLs.

Source: IMF.

evidence indicates that a significant part of the NPLs in the banking sector in Morocco was accumulated over the 1990s, when economic growth was low and extremely volatile (BAM, 2004) and credit risk assessment practices were not rigorous.

In spite of this, real GDP volatility was much lower in the period 1995–2005, when growth was slow but less volatile, even though the country remained overly dependent on the agricultural sector. The latter is extremely dependent on climatic conditions and accounts for between 14% and 20% of GDP.

Given all these difficulties, the Moroccan monetary authorities decided to launch a second reform of monetary policy in 2005.

Period 4: 2005–10

In order to adequately manage liquidity, the monetary authorities launched a second reform of monetary policy instruments. The centrepiece of this reform was the new statutes of the central bank, which explicitly stipulated 'price stability' as its main objective (in cooperation with the Ministry of Finance), and granted broad autonomy to the BAM's operations. A second wave of reforms took place from 2006 with the promulgation of a new legal framework for the banking sector. The aim was to create a unified legal corpus applicable to all credit institutions including non-bank financial institutions, and to provide the central bank with full supervisory autonomy in issuing licenses, prudential regulation, sanctions for non-compliance, and management of troubled credit institutions. The law stipulated that to achieve price stability, it was up to the BAM to determine and use the most appropriate monetary policy instruments.

To be able to exert some control over the overnight rate, the central bank introduced a 24-hour deposit facility in 2004. The purpose of this instrument was to offer a 2.25% return for banks with excess liquidity and to limit the downward trend of the overnight rate on interbank operations. The central bank also introduced swap operations on foreign exchange and raised the reserve requirement ratio from 14% to 16.5%. The operational framework continues to be based on the BAM's interventions on the money market to keep the overnight rate at a level compatible with the Board's decisions. To meet this objective, the central bank uses a set of intervention instruments, consisting mainly of: 1) seven-day operations on calls for tenders, the rate of which is currently set at 3.25% for liquidity advances and ranges between 2.50% and 3.25% for liquidity withdrawals, with fine-tuning operations to manage the interbank rate – in particular repurchase operations of treasury

bonds – carried out on the central bank's initiative; 2) 24-hour advance and deposit facilities – tools that allow the central bank to limit the effects of unforeseen fluctuations of liquidity supply and demand on the behaviour of the overnight rate (Figure 11.2). Finally, the new statutes granted the central bank the authority to issue its own debt instruments in order to regulate the money market. So far, the Board has decided not to use this instrument.

Thus, starting from 2006, the broad aggregate M3 has become the new reference for monetary policy. Its increase has been fixed for most of the recent years within a range of 6% to 7%, on the assumptions that the real GDP growth rate was 3.5% to 4.5%, the inflation rate 2% to 3% and the velocity of money constant. Although the monetary authorities' official target is to preserve the stability of the currency, monetary targeting and price stability have been identified as main policy objectives, which suggests that the BAM had multiple objectives. The new approach allows the BAM to identify various factors that contribute to inflationary pressures and to monitor a set of real and financial indicators

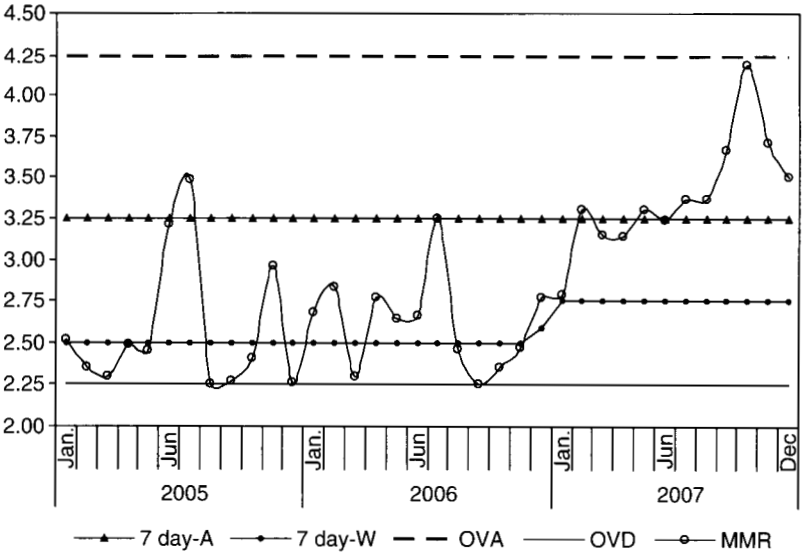

Figure 11.2 Central bank intervention rates and money market rates, 2005–7

Notes: **7-day-A = rate on seven-day advance auctions; 7-day-W = rate on seven-day withdrawal auctions;** OVA = overnight interest rate on BAM's advances; OVD = overnight interest rate granted by BAM on banks' deposits; MMR = monthly average of interbank interest rate (money market rate).

Source: Bank Al-Maghrib Report, various issues.

Table 11.4 Selected macroeconomic indicators (%)

Year	GDP growth rate	GDP Deflator inflation	CPI inflation	Monetary growth (M3)	Credit to private sector[a]
2005	2.98	0.98	1.46	14.34	46.15
2006	7.76	3.29	1.53	17	48.65
2007	2.71	2.04	3.88	16.1	58.41
2008	5.57	3.71	5.92	10.8	63.80
2009	4.9	1	0.62	4.6	66.13

Source: Authors' computation from the World Bank Indicators database (2001) and various issues of the Bank Al-Maghrib report.

Note: [a] % of GDP.

constructed on the basis of a forward-looking approach. This exercise leads to the construction of inflation forecasts and a balance of the risks that may threaten price stability.

Moroccan fiscal performance has improved considerably in recent years, especially during the 2005–8 period. The budget was close to balance in 2007 and 2008 (0.4% of GDP), significantly lower than the deficit of 2% of GDP recorded in 2006. This outstanding performance was chiefly due to strong growth in tax receipts, which were 3 percentage points of GDP higher than in 2006, although the higher receipts were partly offset by increased expenditure, in particular on subsidies for petroleum products and staple foods, and on investment spending. Outstanding public debt was reduced to 57% of GDP in 2009 (government debt represented 47% of GDP in 2009), compared with 58% in 2006 and 62% in 2005. In addition, the Treasury repaid in full the cash advances that the BAM had granted it before the 1980s. This improvement in Morocco's public finances is reflective of its efforts to abide by a fiscal consolidation strategy. Consequently, greater fiscal prudence has augmented private sector confidence.

The Moroccan authorities have started to examine the options for further opening of the capital account through progressive elimination of the remaining restrictions on residents' transactions. This move is expected to deepen the foreign exchange market, improve economy-wide risk management, and contribute to liquidity management in the medium term. The central bank is also preparing the transition to a more flexible exchange rate regime and the possible adoption of an IT framework. In this context, the BAM had to adapt the strategic framework of its monetary policy by implementing a set of criteria for assessing inflationary risks. Meanwhile, the bank put

special emphasis on understanding the transmission mechanisms of monetary policy.

In 2008, the BAM started developing and operating different models to forecast the dynamics of the main macroeconomic and monetary variables. The BAM uses theoretical frameworks such as backward, forward and hybrid models of the Phillips curve, as well as P-star models. It also uses agnostic/statistical models such as univariate ARIMA models and VAR models. The BAM publishes the output of the forecasting exercises in its quarterly monetary policy reports. Since January 2007, the BAM has been conducting a monthly business outlook survey to collect data from industrial firms on output, capacity utilisation, order books outstanding and inventory holdings. Such data help the central bank to assess the short-term economic outlook in an accurate and timely way.[4] The results of such surveys have been published since 2008. The central bank also initiated an ambitious survey on real estate prices in cooperation with the National Agency for Land Registration, but the results of that survey have not yet been disclosed.

The BAM has started in cooperation with other government departments to produce quarterly data on GDP. These data are now downloadable from the IFS-IMF website over a large span of time. In addition, it has constructed a modified version of the consumer price index (CPI), which excludes regulated prices and serves as a measure of core inflation. From the monetary policy point of view, the modified index is more relevant for IT than the CPI index. The BAM publishes on its website a large set of financial and monetary data on a regular basis.

The new statutes of the BAM (Law no. 76-03, implemented in 2006), which replaced the provisions of 1959, have strengthened its independence. They granted the BAM complete autonomy in selecting appropriate financial instruments to meet its monetary objectives. The BAM's Board has been changed by the removal of government officials from its composition. The only exception is the director of the Treasury and External Finance Department within the Ministry of Finance, who continues to act as a member of the council but does not enjoy any voting powers during meetings related to monetary policy decisions. Again in order to avoid any conflict of interest regarding its supervisory functions, the central bank has sold its capital shares in all the credit institutions in which it was previously involved. Under the revised Banking Act, the National Credit and Savings Council is no longer consulted on the direction or implementation of monetary policy, nor is the Credit Institutions Committee asked for its opinion on the technical aspects of policy instruments. The new statutes also amended the

bank's organisation structure. The BAM has since been endowed with a research department,[5] whose main mission is to forecast prices and inflation. The output of the research department is used in the analysis of the quarterly and annual reports. The department is staffed by highly qualified economists and econometricians and is expected to release a series of research papers on the macroeconomic, financial and monetary modelling of issues relevant to Morocco's economy.

The BAM is continuing to strengthen its analytical capacity, and has already fleshed out its analytical toolkit, including its understanding of the monetary policy transmission mechanism. The publication of its monetary policy reports,[6] which each present inter alia an assessment of economic developments and an inflation forecast based on a risk-balance approach, demonstrates the progress achieved in modernising the BAM's analytical and forecasting framework, together with the hope that the strengthening of the BAM's communication strategy has helped to increase the transparency of monetary policy and contributed to the better anchoring of inflation expectations.

11.3 Is Morocco ready for the transition to inflation targeting?

The purpose of this section is to assess the readiness of Morocco to adopt an IT framework and the set of pre-requisites to be met. These pre-requisites can be organised in three broad categories: institutional, economic and technical. Institutional pre-requisites include the central bank's operational independence, its accountability and its public transparency. Economic pre-requisites involve the absence of fiscal dominance, the depth of the financial sector and the flexibility of the exchange rate. Finally, technical pre-requisites include the ability of the central bank to forecast inflation and have a reasonable understanding of the mechanisms through which monetary policy decisions affect the economy.

Institutional prerequisites

Operational independence

The first prerequisite for any country considering the adoption of IT is that the central bank has a considerable degree of autonomy or independence (Bodart, 1990; Debelle and Fischer, 1994). There is a difference between 'goal independence', when the central bank is mandated to determine the final objective of its monetary policy, and 'operational independence', which refers to the central bank's ability to choose freely

its monetary policy tools. Operational or instrument independence is in practice the more relevant prerequisite.

In Morocco, the BAM Act, in force since 2006, endows the BAM with the required autonomy in selecting the appropriate monetary policy instruments to meet its objectives. Article 6 stipulates: 'In order to maintain price stability, the Bank defines and implements the monetary policy instruments'. Moreover, the members of the BAM Board are subject to the incompatibility rule that guarantees their independence and impartiality. They are not allowed to have any responsibility in financial institutions or in the general government. The Treasury and External Finance Director is a member of the board as Ministry of Finance representative but does not enjoy any voting rights in monetary policy decisions.

Accountability to the public

Independence is a key precondition for the adoption of an IT regime. But an independent central bank needs to be held accountable for its performance and be prepared to answer to the public, including through presentations to its elected representatives.

In Morocco, the governor of the BAM is appointed by royal decree and is accountable to the king. The governor can be required by parliamentary commissions to report on monetary policy issues, and might address parliament on his own initiative, should a possible amendment to the BAM Act be approved. There is, however, no specification in the BAM Act on the term, conditions or causes for dismissal of the governor.

Transparency and communication

Transparency and the communication of information on decisions made are part of the central bank's accountability to the public. Transparency is desirable as it can reduce uncertainty, guide expectations, and cut the cost of achieving the inflation target. A transparent monetary policy means that changes in short-term interest rates should not surprise the market (see, for example, Eijffinger and Geraats, 2002; Faust and Svensson, 2001).

In Morocco, a press communiqué presenting the decisions made is released immediately after each BAM board meeting. The governor of the BAM holds a press conference at the beginning of each year to inform the public about his assessment of the economic situation and the direction of monetary policy. The central bank has also been publishing annual reports on its supervision activities since 2005. Other monthly and quarterly reports on monetary statistics and monetary

policy are regularly communicated to the public. The quarterly *Monetary Policy Report*, for instance, provides inflation forecasts and detailed explanations of the reasons for monetary policy decisions (see BAM 2007; 2009a; 2009b; 2010a; 2010b). It offers economic agents a solid basis for their expectations.

Economic prerequisites

Absence of fiscal dominance

Fiscal dominance refers to the presence of excessive fiscal pressures on monetary policy. It can be triggered by a shallow capital market or a fragile banking system. Fiscal dominance impedes the conduct of an independent monetary policy, as the central bank is constrained to implement accommodative policies. The absence of fiscal dominance requires three conditions: 1) the burden of the government's borrowing on the financial system should not be excessive; 2) there must be no direct borrowing by the government from the central bank; 3) the government should not rely on seigniorage revenues. If one or more of these conditions are violated, inflation will have fiscal roots, which undermines the effectiveness of the monetary policy (Blanchard, 2004).

In Morocco, total public debt and domestic government debt have accounted for less than 60% and 40% of GDP, respectively, since 2008. Such debt levels are sustainable[7] and do not represent a burden on Morocco's financial sector. The provisions of the BAM Act prevent it from granting any financial subsidies to the government or state-owned enterprises, except for 'cash advances' which are subject to strict conditions. Cash advances, set at a maximum of 5% of the former year's fiscal revenues, can be used for up to four months per year[8] and are subject to interest. The BAM can stop cash advances to the government

Table 11.5 Fiscal policy indicators, 2004–9

	2004	2005	2006	2007	2008	2009
Inflation	1.5	2.0	3.3	2.0	3.7	1.0
Seigniorage	3.3	2.7	1.8	2.4	0.9	0.7
Public debt/GDP	67.1	71.0	66.1	62.6	56.8	57.0
Fiscal balance/GDP	−4.9	−5.5	−1.8	0.3	−0.4	−2.2

Notes: Inflation is measured by the change in the CPI. Seigniorage is measured as change in monetary base as percentage of nominal GDP. Public debt includes government and public sector debt.

Source: Authors' calculations based on IMF data.

should money market conditions require it to do so. These provisions, embedded in the BAM act, ensure a clear separation between fiscal and monetary operations.

The reliance on seigniorage, which reflects the net revenue derived from money creation, has been modest over recent years. The level of seigniorage in Morocco stood below 1% in 2008 and 2009. This reflects the fact that Morocco's government is not using seigniorage revenues to close the transitory gap between revenues and spending flows. Fiscal resources, which represented 23% of GDP in 2009, are the key source for financing public spending. The contribution of privatisation revenues and foreign grants has been marginal over recent years. Moreover, the government meets its funding needs through the market. The budget posted a surplus of 0.3% in 2007, significantly lower than the deficit of 5% of GDP experienced over the period 2000–5. The 2009 budget deficit of 2.2% of GDP, caused by the impact of the global economic crisis on Morocco's economy, remains manageable and does not represent any threat to an independent monetary policy operated by the BAM.

Deep financial sector

Deep financial markets stand as an important condition for the adoption of IT and the pursuit of an independent monetary policy. A lack of deep financial markets impedes the proper operation of transmission mechanisms and reduces the effectiveness of monetary policy in curbing inflation.

In Morocco, bank lending to the private sector represented two-thirds of GDP in 2009 and market capitalisation has approached 80% of GDP over the period 2007–9. The share of NPLs in total credits decreased from 19.4% in 2004 to less than 6% by the end of 2009. Moreover, banks are increasingly complying with provisioning rules on NPLs. The share of provisions in total NPLs soared from 46% to 75% over the last three years (Table 11.6). Compared with banking sectors in other emerging and developing countries, Morocco's banks are healthy.

The depth of the financial sector in Morocco has substantially improved over the last decade. It still has to overcome a number of

Table 11.6 Non-performing loans (NPLs) of Morocco's banks, 2004–9

	2004	2005	2006	2007	2008	2009
NPLs (% of total loans)	19.4	15.7	10.9	7.9	6.0	5.5
Provisions (% of NPLs)	59.3	58.6	71.2	75.2	75.3	74.1

Source: IMF and BAM.

weaknesses, however. The private bond market is very shallow, and only a very few non-financial private companies raise money there. The stock market, despite its high share in GDP, has not attracted many companies: fewer than eighty[9] are listed, although there are more than 500 companies that meet the stock market's listing criteria.

Exchange rate flexibility and pass-through

The choice of exchange rate regime influences the capacity of the central bank to conduct an independent monetary policy. Morocco has adopted a basket peg regime since 1973. Under that regime, the external value of the dirham has been set on the basis of a basket of currencies that has evolved over time to reflect Morocco's foreign trade structure. The objective of the Moroccan authorities was to stabilise nominal and effective exchange rates, and prevent abrupt variations in the value of the dirham associated with any single currency. Three main revisions of the basket have taken place in the last three decades. The first occurred in 1990 through an increase of the weight of European currencies in the basket to reflect Morocco's greater economic partnership with Europe. In 1999, with the launch of the European single currency, the structure of the basket was amended. The former national currencies of European countries were replaced by the euro. Finally, the last revision took place in 2001. The composition of the basket was limited to two prominent international currencies: the euro and the US dollar. Recently, the central bank made the composition of the basket public. The weights are 80% for the euro and 20% for the dollar.

The BAM is preparing its transition to a more flexible exchange rate regime. So far, no specific date has been set for such a transition. In order to assess the exchange rate pass-through, the central bank had to separate the CPI changes caused by exchange rate and/or international price shocks from changes arising from domestic supply and demand conditions. The BAM proceeded to break down the CPI into tradable and non-tradable goods and services. Tradables are goods imported or sensitive to international price competition. Non-tradables consist of goods and services not affected by international price competition. But food products, although their prices are mainly determined by domestic supply shocks, fall under tradables. To deal with this issue, the BAM constructed a sub-index of tradables (CPIXT) that excludes food products. This sub-index serves to measure the magnitude of international price transmission and exchange rate movements on domestic tradable prices.

The index (CPIXT) allows the BAM to better capture the correlation and adjustment lags between the inflation of tradables in Morocco and

price changes in trade partners. On the basis of the BAM's estimates, more than 84% of Morocco's trade partners' price changes are reflected in the CPIXT.

Finally, capital account transactions are now unconstrained for non-residents. Morocco's authorities have taken a number of measures with the objective of gradually relaxing the remaining restrictions. For example, the authorities recently allowed insurance companies and pension funds to invest up to 5% of their reserves and assets overseas. Mutual funds, on the other hand, can invest up to 10% of their assets on the foreign markets. Moroccan companies can invest abroad up to €3 million a year without authorisation from the foreign exchange office and exporters can retain up to 50% of export revenues in foreign currency.

Technical prerequisites

Technical ability to forecast inflation

From the technical point of view, the central bank's effectiveness in conducting monetary policy is conditional on its ability to anticipate future movements in inflation. This in turn depends on the capacity of its staff to develop appropriate models to forecast the inflation dynamics (de Haan et al., 2007). Since December 2006 the BAM has been issuing a quarterly monetary policy report with an entire chapter on inflation forecasts. These forecasts are based on a number of models, the analysis of macroeconomic indicators and the opinions of experts.

The BAM has developed a large number of statistical and economic models. First, ARIMA models are used for monthly and quarterly inflation forecasts. These models can generate inflation forecasts based on previous trends without any explicit information on macroeconomic variables. Second, P-Star models are used for quarterly and annual inflation forecasts. The P-Star model is built on the general theoretical framework of the quantity theory of money and accounts explicitly for the linkages between inflation, economic activity and monetary variables. In addition, the BAM uses the VAR-X model, the Markov regime model, the Bayesian VAR and the hybrid-expectations-based Philips curve model of inflation. The forecasts are obtained on the basis of the most likely assumptions. However, there are many sources of uncertainty related either to the models used or to the assumptions made on the future of exogenous variables.

The credibility of inflation forecasts, however, is often assessed by comparing them, ex post, to observed rates of inflation. In recent years the

absolute forecast error (AFE) has ranged between 0 (the third quarter of 2007) and 2.5 points (the fourth quarter of 2009). Most of the difference in 2009 stemmed from the strong volatility of fresh produce prices triggered by supply shocks, especially climate-related ones (BAM, 2009a).

Because the inflation trend in Morocco has recorded structural breaks over recent decades due to internal and external factors, the BAM has developed a new model of the inflation trend taking into account structural shifts. The model consists of three equations specifying the trend, the fluctuations and the variance of inflation. Its estimation is based on a fifty-year observation sample, using monthly and quarterly data. The model makes possible forecasts of the level and the variance of inflation, which contribute to a better assessment of uncertainty. A statistical evaluation of this model over a sufficiently long period indicates that it has a high forecast performance.[10]

The regular publication of quarterly monetary policy reports shows the progress achieved by the BAM and its technical capability in modelling and forecasting inflation.[11] The reports have also strengthened the BAM's communication strategy and increased the transparency of its monetary policy. Finally, the reports have contributed to better anchoring of inflation expectations.[12]

Knowledge of the monetary policy transmission mechanism

The success of an IT regime depends not only on the decisions made by the central bank but also on the responsiveness of the other components of the financial system. To this end, the central bank needs to rely on its knowledge of the monetary transmission mechanism (MTM). In Morocco, the BAM has substantially improved its understanding of the MTM. Figure 11.3 portrays the key channels through which monetary policy decisions, such as changes in the key central bank rate, are transmitted to the rest of the economy.

Technically, the BAM has developed three models to assess the impact of policy decisions on the economy: the first is a simultaneous equations model, the second is an error correction model (ECM) and the third is a VAR-X model. The last consists of twelve variables divided into three blocks. The first block consists of completely interactive endogenous variables, on which there are no restrictions. The second block is made of partially interactive endogenous variables subject to restrictions on the links of causality and instantaneous interdependence. The third block includes strictly exogenous variables. The strength of this type of model is that it is possible to impose restrictions on the interactions between the variables on the basis of an a priori rationale regarding the

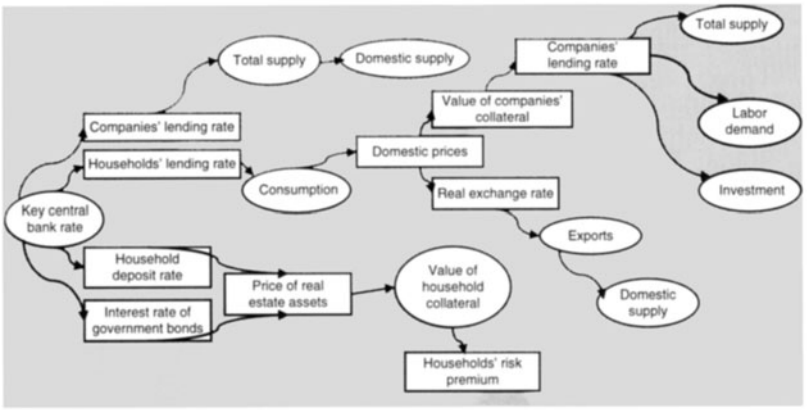

Figure 11.3 Overview of the monetary policy transmission mechanism
Source: El Aynaoui (2008).

functioning of the economy, in contrast to models using only statistical relationships between the variables (El Aynaoui, 2008).

Table 11.7 and Figure 11.4 illustrate the results provided by the error correction model (ECM) and the VAR-X respectively. Table 11.7 shows the pass-through of the interbank interest rate to the key deposit and treasury bills (TB) rates. For instance, 60% of an increase in the interbank rate is instantaneously reflected in the 52-week TB rates. The magnitude of the pass-through reaches 92% in less than two quarters. The same change in the interbank rate translates into a change of 2% in deposit rates in the short term and more than 70% some quarters later.
In addition, the figure represents the pass-through of the BAM key refinancing rate (variable Y_6) to inflation (variable Y_2) and 52-week T-bills rate (variable Y_3).

In conclusion, the central bank of Morocco largely meets the pre-requisites for adopting an IT regime. The BAM is operationally independent, accountable, and transparent in communicating its decisions and their underlying justifications. The Bank has no fiscal obligations and the public finance outlook seems favourable with the budget deficit contained and sovereign debt sustainable. The financial sector is characterised by a large and healthy banking system, and a growing stock market. The BAM also fulfils the technical preconditions for adopting an IT regime. It has developed significant expertise in modelling and forecasting inflation and seems to have a deep understanding of

Table 11.7 The pass-through of the interbank rate to deposit rates and the treasury bill rate (quarterly data 1996–2007)

	Short-term impact	Long-term impact	Average terms (quarterly)
Weighted average rate of 6- and 12-month deposits	0.02	0.73	4.9
Weighted average rate of 6-month deposits	0.02	0.73	3.6
Weighted average rate of 12-month deposits	0.03	0.70	6.9
Weighted average rate of 52-week TB rates	0.60	0.92	1.8

Source: El Aynaoui (2008).

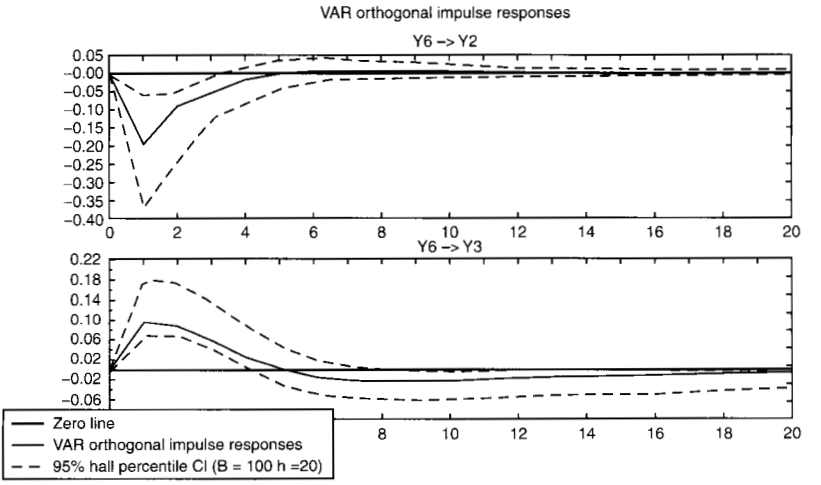

Figure 11.4 Pass-through of the BAM key refinancing rate to inflation and to 52-week treasury bills

Source: El Aynaoui (2008).

the mechanisms through which monetary policy decisions affect the economy. The private bond market, however, remains underdeveloped and the number of listed companies has stalled. The exchange rate pass-through appears to be high and domestic prices are strongly affected by commodity prices on international markets. Finally, the fear of floating remains dominant among policymakers, who need to develop a more flexible exchange rate framework.

11.4 The Moroccan business cycle and the characteristics of supply and demand shocks

Cycles and shocks

It is very helpful for central bankers to have sufficient knowledge of the magnitude of the shocks and asymmetries that characterise the business cycle, especially when IT is adopted. The reference cycle chronology for the case of Morocco will be established here using the 'growth rate' cycle definition, which delineates periods of cyclical upswings and downswings around an underlying trend. The procedures used to identify peaks and troughs in the growth rate cycle are analogous to those used in identifying classical business cycle turning points, the only difference being that they are applied to the growth rates of the same time series, rather than their levels. Identified turning points are selected using a minimum amplitude rule, which requires the amplitude from peak to trough and from trough to peak to be at least as large as one standard error of the cyclical component of output.

More precisely, the criteria used here to date the Moroccan business cycle include the following: 1) peaks always follow troughs and troughs always follow peaks; 2) the turning point is the most extreme point between upswings and downswings; 3) the length of time over which the change from upswing to downswing (or vice versa) takes place is required to be at least three months; 4) the size of the change, namely the absolute difference between a trough and a peak, cannot be smaller than 1.5 percentage points; 5) where there are two or more turning points with equal values, we select the most recent point. The results of this exercise are reported in Table 11.8. It is clear from the table that over the 1990Q1–2009Q4 period five complete cycles are identified. It is worth noticing that there are significant differences in amplitude between the cycles. Finally, the duration of the cycles varies sharply, and asymmetries between upswings and downswings are evident. The duration characteristics are useful for computing asymmetric indicators such as steepness and deepness. The length or duration of a recession (expansion) is defined as the number of quarters from trough to peak. Table 11.8 shows also that recessions and expansions do not have on average the same duration, which might indicate that the Moroccan cycle is rather asymmetric.

The results reported in Table 11.9 emphasise the asymmetry evidence by distinguishing two types of asymmetry that might exist separately or simultaneously. The first occurs when contractions are steeper than expansions; this type of asymmetry is referred to as steepness. The

Table 11.8 Turning points, durations and amplitudes

Trough		Peak		Duration		Amplitude	
No.	Dating	No.	Dating	Recession	Expansion	Recession	Expansion
T1	1990-Q4	P1	1991-Q2	–	2 quarters	–	6.19
T2	1992-Q1	P2	1994-Q1	3 quarters	8 quarters	12.24	10.22
T3	1995-Q1	P3	1996-Q4	4 quarters	7 quarters	16.32	24.71
T4	1999-Q1	P4	2001-Q1	9 quarters	8 quarters	19.5	7.19
T5	2007-Q1	P5	2009-Q2	24 quarters	9 quarters	5.94	1.88
			Average	10 quarters	6.8 quarters	13.5	10.04

Source: Authors' calculations.

second occurs when troughs are deeper than peaks are tall; this type of asymmetry is referred to as deepness, and it pertains to relative average levels of peaks and troughs and refers to the characteristics that troughs are further below trend than peaks are above. It is clear from Table 11.9 that these two types of asymmetry are present in the Moroccan business cycle. Indeed, the level of peaks and troughs is not identical, and there are significant differences in the distances from peak to trough and from trough to peak. Furthermore, the steepness of the recessions is significantly different from the steepness of the expansions (2.64 versus 1.48), while recessions are on average less deep than expansions (1.66 versus 2.24). Likewise, expansions and contractions do not have the same duration (10 quarters for recessions versus 6.8 quarters for expansions). These findings lend support to the hypothesis that the Moroccan business cycle is rather asymmetric.

The previous results indicate that recessions are rather steep and long-lasting when compared with expansions. This finding might have serious policy implications when it comes to pursuing IT. For instance, it implies that focusing on the inflation target may become intolerable for the government and for public opinion. In such a case, the central bank might have to overlook its inflation target and to redirect its policy towards real targets. The government might also come under pressure and be forced to use a fiscal policy relying more on seigniorage, which might undermine the credibility of IT.

The most challenging issue when it comes to pursuing IT in Morocco is how to deal with non-policy shocks, namely supply and demand shocks. Supply shocks have a permanent effect on output, whereas demand shocks have only transitory effects. Furthermore, both supply

Table 11.9 Steepness and depth

Trough		Peak		Steepness		Depth	
No.	Dating	No.	Dating	Recession	Expansion	Recession	Expansion
T1	1990-Q4	P1	1991-Q2	–	3.10	–	7.31
T2	1992-Q1	P2	1994-Q1	4.08	1.28	1.94	2.63
T3	1995-Q1	P3	1996-Q4	2.17	3.53	2.05	2.96
T4	1999-Q1	P4	2001-Q1	0.25	0.90	1.19	2.29
T5	2007-Q1	P5	2009-Q2	2.11	0.21	1.46	1.08
			Average	2.64	1.48	1.66	2.24

Source: Authors' calculations.

and demand shocks have permanent effects on the price level. A supply shock depresses the price level, whereas a demand shock increases it. The widely used methodology to separate supply and demand shocks is the one suggested by Blanchard and Quah (1989, 1993) and Bayoumi and Eichengreen (1993), which supposes that the economy is hit by two types of shock, namely demand and supply shocks. In what follows, we briefly describe this methodology.

Real GDP and prices are supposed to be generated by a bivariate VAR that can be expressed under an infinite moving average process representation of supply and demand shocks:

$$\Delta x_t = A(L)\varepsilon_t \tag{1}$$

where Δ is the first-difference operator, $\Delta x_t^T = [\Delta y_t, \Delta p_t]^T$ where y stands for the real output and p for the price level, and $A(L)=A_0+A_1L+A_2L^2+...$ is the matrix polynomial in the lag operator. The A_i are 2×2 matrices that propagate the effects of shocks to the key variables. ε is a vector of demand and supply shocks $[\varepsilon_{dt}, \varepsilon_{st}]^T$. It is assumed that the structural shocks are orthogonal and their variances are normalised to unity.

The structural shocks in equation (1) are not observable, and consequently the model in equation (1) cannot be estimated empirically. Its dual VAR representation can instead be used to recover the supply and demand shocks. The stationarity of the variables allows the VAR to be rewritten under the so-called Wold moving average representation:

$$\Delta X_t = D(L)u_t \tag{2}$$

where $D(L) = D_0+D_1L+D_2L^2+...$ $u_t = [u_{pt}, \varepsilon_{vt}]^T$ is a vector of reduced form disturbances with $E[u_t] = 0$ and $E[u_p, u_y]^T = \Omega$. It is worth noting that the VAR residuals in equation (2) are often correlated across equations, reflecting their joint dependence on common underlying shocks as well as the direct contemporaneous dependence of the variables on each other. Thus, to identify the structural (fundamental) shocks, it is necessary to purge from the residuals of each variable of the VAR the shocks which are derived from the other variables. To do so, it is helpful to have recourse to long-term restrictions in the tradition of Blanchard and Quah (1989, 1993). The basic idea of the identification process is straightforward. A close look at equations (1) and (2) reveals that the relationship between the two representations is $u_t = A_0\varepsilon_t$. The knowledge of the elements of the matrix A_0 enables us to compute the supply and demand shocks. The restrictions used are the following: 1) the two normalisations of the shocks; 2) the assumption that demand and supply shocks are orthogonal; 3) the assumption that the long-run response of output to demand shocks is zero ($A_{11}(1) =0$). Once A_0 is identified, it is therefore possible to retrieve the supply and demand shocks from the residuals of the estimated VAR.

The data used are real GDP and the CPI. These variables are quarterly and sourced from the IMF's *International Financial Statistics* (IFS) CD-ROM. They cover the period 1990Q1–2009Q4. The VAR lag length was selected using the Akaike information criterion (AIC). Many lag lengths were tested, and the one that turned out to be relevant is three lags. Consequently, the VAR with three lags has been estimated in order to uncover the supply and demand shocks in the case of Morocco over the last three decades. To this end, the 'real time' historical decomposition is calculated. These functions simulate the responses of the key variables to one standard deviation in each of the structural shocks (supply and demand) on average (i.e. over the whole sample period). After mapping the reduced form residuals into the structural (fundamental) shocks, accumulated impulse response functions (IRFs) were calculated and plotted showing the effects of the shocks.

The results of the accumulated IRFs are reported in figures 11.5 to 11.8. They seem to be fully compatible with the theoretical predictions above. For instance, Figure 11.5 indicates clearly that the long-term impact of a demand shock on output is zero. On the other hand, Figure 11. 7 shows that supply shocks have a permanent effect on output.

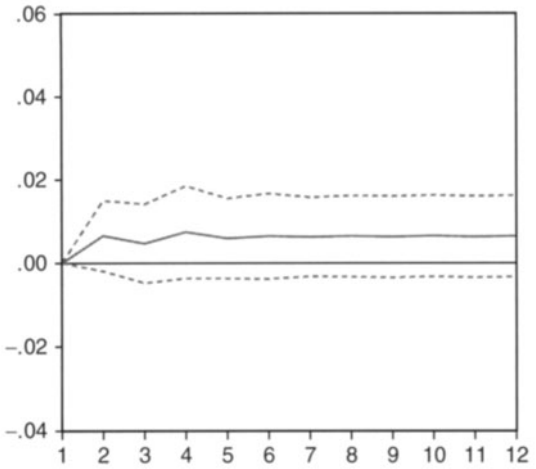

Figure 11.5 Response of DY to one standard deviation of demand shock

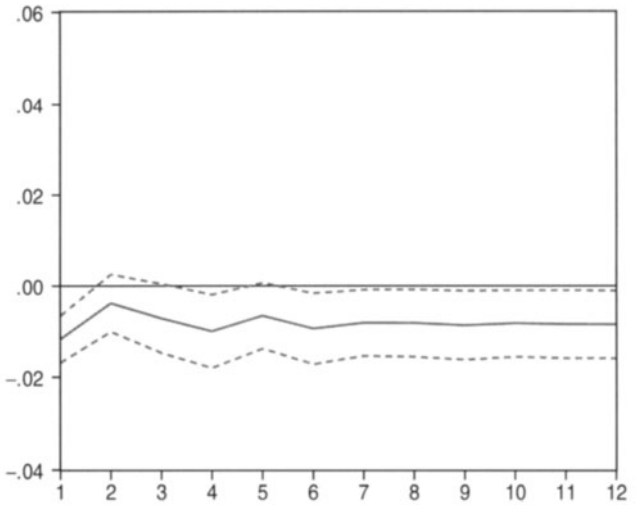

Figure 11.6 Response of DP to one standard deviation of supply shock

In addition, Figures 11.9 and 11.10 present the distribution of the supply and demand shocks. It is clear from these figures that negative supply shocks are dominant. Supply shocks used to be more severe and more volatile during the 1990s than they have been over the last decade. The relative excessive volatility of Moroccan output might be

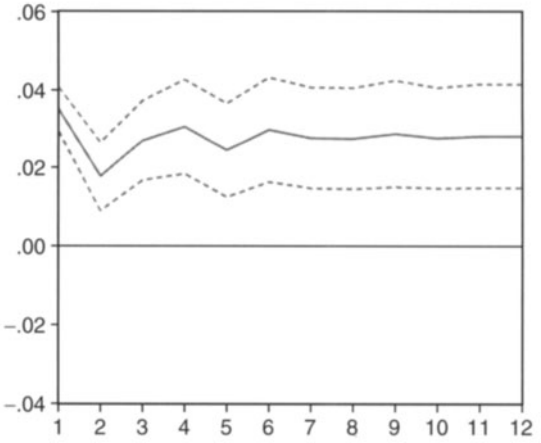

Figure 11.7 Response of DY to one standard deviation of supply shock

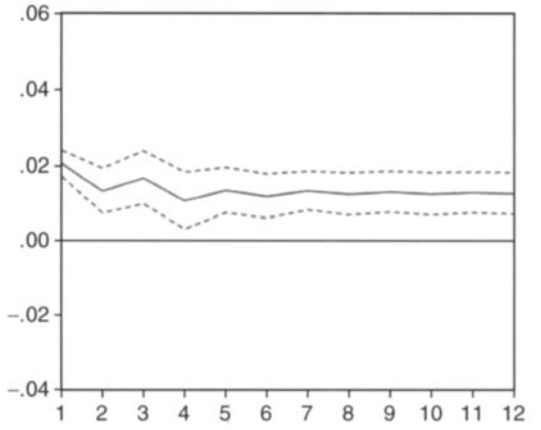

Figure 11.8 Response of DP to one standard deviation of demand shock

explained by the very frequent (negative) shocks that have hit its agricultural sector.

As for the demand shocks, their dynamics seem to be less pronounced when compared with those of the supply shocks. However, Figure 11.10 indicates that demand shocks were larger during the period 2006–8, probably because of the surge in commodity prices and/or the impact of the global financial crisis.

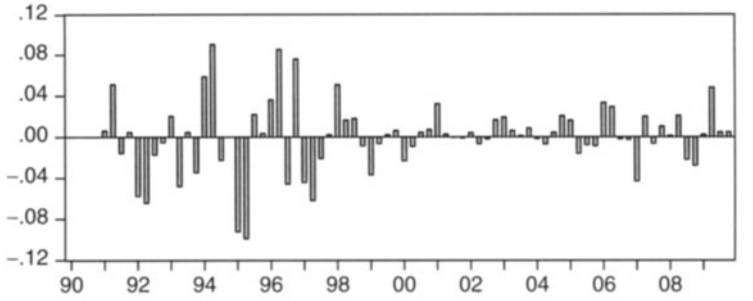

Figure 11.9 The distribution of supply shocks

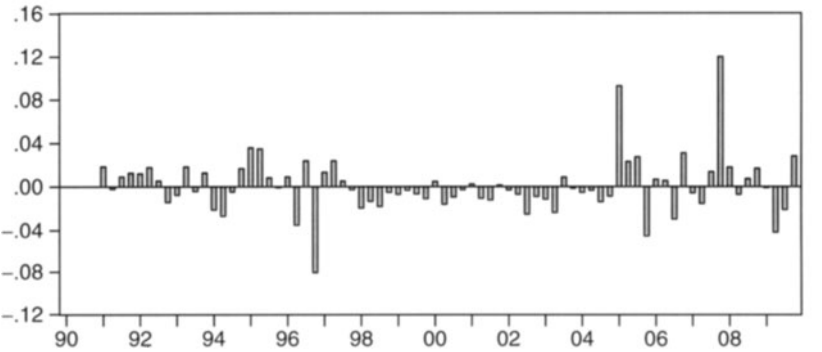

Figure 11.10 The distribution of demand shocks

This section has show that Moroccan real GDP is subject to many external shocks, especially supply shocks, both negative and positive. How can IT address these types of shock?

Can IT tackle nominal shocks?

A positive demand shock brings about both a decrease in price and an increase in output by moving the economy upwards along a rising supply curve. The policy response under IT is a higher interest rate. The higher interest rate has a direct negative effect on demand and leads to an exchange rate appreciation, which shifts demand away from domestically produced goods. However, the most challenging task is how to deal with supply shocks under IT.

In the case of positive supply shocks, IT can stabilise the cycle without triggering any unwanted effects. For example, subsequent to

a positive supply shock hitting non-traded supply (i.e. the agriculture sector), prices decrease and production increases. Under IT, the central bank wants to hit its announced target, so it cuts the policy rate. As a consequence, the currency depreciates, which boosts the traded output as well. The combined effects of the interest rate cut and high traded goods prices shift the non-traded sector demand curve to a new equilibrium where the output is higher than before and prices are lower. In the case of a positive shock hitting the traded sector (manufacturing or tourism), on the other hand, an IT central bank should not react, since such shocks do not trigger any domestic price movements.

In the case of a negative supply shock (e.g. oil price surge, food prices increase, drought or flood), an IT central bank would face serious difficulties in accomplishing its mission. Negative supply shocks cause prices to increase and output to decline. An IT central bank will systematically react to such a situation by increasing the interest rate; however, by doing so, it reduces demand, which adds to the initial contraction caused by decreased supply, thereby exacerbating the business cycle and delaying the recovery. Thus, it is not optimal policy to respond to negative supply shocks with a rise in the interest rate. More specifically, it is inappropriate to fight the surge of inflation, which is primarily caused by exogenous forces of rising energy and food prices on the international market, by raising interest rates. A pre-emptive central bank should, however, increase interest rates – not to control the exogenous price factors, but rather to control the second-round effect of inflation expectations, where rising inflation (in this case caused by exogenous factors) has the effect of creating an expectation of continued rising inflation, which economic agents (producers, consumers and investors) automatically build into their future pricing structures, thereby generating continued inflation based on perceived inflationary pressures rather than real price pressures. By doing so, the central bank is therefore trying to prevent a relative rise in prices from becoming entrenched in expectations of inflation. The interest rate is appropriate to check what is called the second round of inflation – the expected inflation that automatically gets factored into prices. To accomplish such a mission, it is indispensable that the central bank should be insulated from political pressure; and for that to be so, it has to be independent.

Demand shocks move inflation and output in the same direction, so that stabilisation of one leads to stabilisation of the other; but supply shocks move output and inflation in different directions, highlighting the fact that supply shocks are magnified by IT, and place the bur-

den of stabilisation on complementary fiscal policy. Consequently, IT in the presence of major supply shocks exacerbates the business cycle.

In bad times – that is, when the economy faces a recession or simply slows down – fiscal revenues tend to decline and it is likely that government expenditure does not fall in the same proportion or at the same speed. Consequently, the fiscal deficit tends to be amplified, which leads to an increase in the country risk premium, given the lower capacity of the country to repay external debt. Again, the recent experience of emerging markets with flexible exchange rates has shown that an increase in country risk premium may lead to a change in the portfolio of private investors and, consequently, to the depreciation of the domestic currency. Depreciation, in turn, impacts on the expectations of inflation in the following periods, due to increases in the price of tradable goods. In the case of Morocco, this impact is likely to occur through increases in prices of capital goods and intermediate goods (such as oil), which affect the production costs of many sectors of the economy. An IT central bank is expected to react to the rise in inflation expectations by tightening monetary policy (i.e. increasing interest rates), which would intensify the decline in economic activity, especially by reducing private spending. The interest rate increase would also depress public spending, since higher interest rates imply higher interest payments on existing public debt and the necessity for the government to generate a higher primary surplus

Likewise, in good times, higher fiscal revenues induce a decrease in the country risk premium and may bring about the appreciation of the domestic currency, which is not always desirable. In addition, when the domestic currency is depreciating, prompt reaction is needed if the inflationary effects of depreciation are to be offset. However, when the currency is appreciating, the deflationary effects are not counterbalanced with the same force and speed. There may be two reasons for this strategic behaviour: first, in such a case the central bank may find it helpful to achieve the target for inflation in periods of disinflation; second, when the economy is hit by negative supply shocks, responding promptly and vigorously by tightening policy will not help to achieve the goal and may in contrast exacerbate the recession. In short, the central bank under IT and a flexible exchange rate would in general react more strongly to exchange rate depreciations than to exchange rate appreciations, implying thereby that monetary policy is characterised by rather asymmetrical behaviour under these conditions; this may generate a downward

bias to aggregate demand, which in turn impacts negatively on output and employment in the long run.

11.5 Conclusion

The IT strategy has many benefits. The most important of them are certainly the enhancement of transparency and the reduction of price variability. Morocco has made a lot of effort to meet the preconditions for IT. The BAM has made substantial progress in enhancing public understanding of monetary policy, increasing central bank accountability, recruiting skilled staff and reforming the statutes of the central bank. It has also developed significant expertise in modelling and forecasting inflation and seems to have a deep understanding of the mechanisms through which monetary policy decisions affect the economy.

Despite all the progress made by the Moroccan monetary authorities, however, the question of whether or not it should adopt the IT strategy remains open. While the Moroccan financial sector is characterised by a large and healthy banking system, and a growing stock market, the private bond market remains underdeveloped. The exchange rate pass-through appears to be high and domestic prices are strongly dependent on commodity prices in international markets. Moreover, the data indicate that Morocco has been subject to frequent demand and supply shocks, and supply shocks were especially severe and volatile during the 1990s. More specifically, negative supply shocks have been found to be dominant. And the relatively high volatility of Moroccan output might be well explained by these frequent shocks to its agricultural sector. Such negative supply shocks might undermine the effectiveness of the central bank's policy actions, especially under an IT strategy.

In the case of a negative supply shock, a central bank committed to an inflation target has no option but to increase the interest rate. Obviously such a policy would reduce demand, which would add to the potential initial contraction caused by decreased supply, thereby exacerbating the business cycle and delaying the recovery. Thus, it is not optimal policy to respond to negative supply shocks with a rise in the interest rate. In brief, it would not be sensible and rational for a central bank hit by negative supply shocks to try to contain the surge of inflation brought about by rising energy and food prices on the international market by raising interest rates.

In sum, Morocco is in a position where it could move quite easily to IT. But it is not clear that it would be in its interest to do so.

Notes

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1. With the 1993 banking law, banks started to fulfil more effectively their role as providers of funds to private agents. Credits to the private sector rose from 31.5% of GDP in 1983 to 40.7% in 1993 and more than 60% of GDP in 2006. The monetary authorities increased their use of indirect instruments to manage the money supply through reserve requirements and to allocate liquidity to banks through auctions on money market and open market operations.
2. To accommodate excess liquidity, the central bank had to reduce its intervention rates: its auction rate was reduced (by six successive cuts) from 6% in January 1999 to 3.25% in December 2002, its ceiling rate from 7.5% to 4.25% over the same period.
3. See BAM (2006).
4. There is general agreement among economists and central bankers that decisions about monetary policy should be made on the basis of the most extensive information set available, including indicators of private sector perceptions about the future path of economic variables, information about variables outside the model, information about leading indicators, as well as any other judgmental knowledge that will help in predicting inflation.
5. See the BAM website.
6. The BAM started publishing quarterly monetary policy reports in 2006. They are in three languages – Arabic, French and English – and are downloadable from the bank website.
7. The BAM ran a sustainability scenario in the 2009 annual report and found that Morocco's public debt was sustainable.
8. Article 27 of the BAM Act.
9. The number of listed companies in Jordan approaches 300. In Egypt the number is much higher.
10. See the BAM's *Monetary Policy Report*, September 2009. This sophisticated model uses SCARMA- EGARCH: Structural Change ARMA with Exponential GARCH component.
11. Inflation forecasts are presented in a fan chart in which the forecast from the baseline scenario and confidence intervals ranging from 10% to 90% are shown. Each interval addition of the same colour, on both sides of the central scenario, raises by 10% the probability that inflation will fall within the range delimited by these intervals. For instance, the range delimited by the fifth interval around the central forecast represents the equivalent to a 50% probability that inflation will fall within that interval in the following quarters. For more details, refer to the BAM *Monetary Policy Report*, March 2007, at http://www.bkam.ma/wps/wcm/resources/file/ebafe6011498b8c/RPM_mars2007.pdf.
12. Bank Al-Maghrib, *Annual Report*, 2009.

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