FEMISE RESEARCH PROGRAMME

2010-2011

Macroeconomic and Financial Crisis Managementin the Southern and Eastern Mediterranean: Diagnosis And Prospects

Research n°FEM34-24
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December 2013

Ce rapport a été réalisé avec le soutien financier de l'Union Européenne au travers du Femise. Le contenu du rapport relève de la seule responsabilité des auteurs et ne peut en aucun cas être considéré comme reflétant l'opinion de l'Union Européenne.

This document has been produced with the financial assistance of the European Union within the context of the FEMISE program. The contents of this document are the sole responsibility of the authors and can under no circumstances be regarded as reflecting the position of the European Union.

MACROECONOMIC AND FINANCIAL CRISIS MANAGEMENT IN THE SOUTHERN AND EASTERN MEDITERRANEAN: DIAGNOSIS AND PROSPECTS

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This report was produced with financial assistance from the European Union within the FEMISE programme 2010-11 (reference FEM34-24). Established in June 2005, the Forum Euroméditerranéen des Instituts de Sciences Économiques (FEMISE) is a Euro-Mediterranean network consisting of more than 80 economic research institutes, representing the 37 partners of the Barcelona Process.

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ISBN 978-94-6138-365-5

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EXECUTIVE SUMMARY

The global financial crisis, which started in the summer of 2007 and deepened in the aftermath of the failure of Lehman Brothers in September 2008, has led to a virtual collapse in economic activity and increased financial volatility worldwide. For the developing countries, the main channel of transmission has been a drop in external transactions, such as trade, financial and capital flows, and remittances.

While on average the economic slowdown has been modest, the emerging economies in the southern and eastern Mediterranean countries (SEMCs) are likely to experience a slow recovery, further hampered by the regional political instabilities brought on by the Arab spring. Limited external financing, little space for fiscal stimulus, a real appreciation of most domestic currencies, sluggish receipts from tourism and remittances, and increasing food and energy prices in the future will all continue to be a drag on growth for some time. Thus, the weaknesses in the short term are likely to persist, largely affected by the slow improvement in the world economy.

On the external sector. A slowdown in exports is expected to continue as long as growth and unemployment figures for trading partners remain gloomy. Tourism and remittances have proved resilient so far, but with the global recession continuing and wealth effects settling in, countries in the region might not be able to sustain higher GDP growth. Similarly, global foreign direct investment (FDI) flows fell sharply and SEMCs are expected to continue to be directly affected by this trend. Competition to attract FDI will become even tougher as countries in the region continue to experience a downgrading trend as a result of political instabilities.

On the real sector. The repercussions of the crisis continue to reverberate from the balance-of-payments to the real economy. Since external demand declined sharply, enhancing domestic demand remains the only way to increase growth, at least until trading partners show sustainable economic recovery. The lack of modern infrastructure to raise the region's competitiveness and take full advantage of the growing global manufacturing and services trade can also pose a risk for investments and growth.

On the monetary sector. With the decline in interest rates and inflation worldwide and also the decline in inflation in all the sampled countries, there seems to be room for adopting an expansionary monetary policy through decreasing interest rates to stimulate domestic demand.

On banking and capital markets. Most of the SEMCs have been spared the negative impacts of the crisis during its initial phase in 2007-08. Banks in the region had little direct exposure to the toxic products that weakened the balance sheets of many banks in the US and the EU. Indeed, the impact of the financial crisis on the banking systems assessed by pre- and post-crisis comparisons of the liquidity, performance, efficiency and fragility showed divergent impacts between countries. Overall, the results underline that the impact of the financial crisis on the banking sectors in the SEMCs was very limited.

The more developed banking sectors of Israel and Turkey were the only exceptions. In Israel both performance and efficiency deteriorated, while the system became more fragile. In Turkey both liquidity and performance worsened and the banking system became more fragile. The impact of the financial crisis on capital markets varied from country to country. In particular, as of November 2012, the Israeli, Tunisian and Turkish stock exchanges had outperformed the US Dow-Jones index during the global crisis. At the same time, the Egyptian, Jordanian, Palestinian and Syrian indices remained below their January 2007 levels.

The correlation coefficients between the region's stock markets and commodity indices highlight several interesting findings. The results show that the correlations clearly increased in Israel, Turkey, the US, and Europe after the crisis (up until the ousting of Mubarak). The same is also true only for grains in Egypt, especially after the onset of the Arab spring uprisings. The correlation with grains also increased in the post-crisis period, up until January 2011, for Palestine. The correlation of the market returns with Brent oil increased in Jordan, but only weakly so. The correlation of the market returns with the US and EU markets highlights a close relationship between these economies. Clearly, the correlation with the US and EU is extremely strong for Egypt, Israel and Turkey. The results show that the relationships have not increased after the crisis for most cases, except for Egypt (with the US only), Tunisia (only weakly) and Jordan (relatively strongly so). Even though Israel's and Turkey's stock markets display the closest interdependence with both the EU and the US, the relationship has not become more sensitive after the crisis or the ousting of Mubarak.

Much like developing countries elsewhere, the economies in the region have implemented various initiatives to respond to the crises. To a

large extent, fiscal measures have been the preferred instrument of choice, owing partly to the limited policy space that the authorities have in these countries. While these policies appear to have been successful, they have also put additional strain on existing and future fiscal pressures.

On fiscal sustainability. The research reveals several vulnerabilities of the Tunisian and Egyptian economies that clearly undermine their debt sustainability. One important conclusion from the debt sustainability scenario analysis performed is that political instability has significant implications on debt sustainability. Political stability is crucial for investments – both domestic and foreign – in Egypt and Tunisia. With political uncertainty, investments tend to decline, remain low and take time to pick-up. This means lower production (lower GDP), which might also translate into higher unemployment (as the population and the labour force increase every year). Lower production also means lower profits for investors and lower income for workers, leading to lower revenues for the government. As seen from their budgets, tax revenues are forecasted based on highly optimistic assumptions that do not really take into account the possibility for a lower level of private investment and therefore lower level of tax revenue. The direct implication of such an optimistic assumption is an increase in the budget deficit and in the debt ratio, beyond the level the government expected.

Another implication of the political instability is the loss of trust on the part of the international community in political transitions. This can lead to downgrades of the countries' credit ratings and an increase of their interest rates for borrowing on the international markets. This can also make it much more difficult for the government to finance its deficit or to refinance its existing debt, putting further pressure on debt sustainability. A second important conclusion is related to expenditures. Indeed, the revolutions demanded more social justice and more employment opportunities, but increasing current expenditures would be a big mistake. Any government that is freshly elected, and seeks re-election or more power, would be tempted to increase wages and increase hiring in the public sector to satisfy the population. Such an action, however, would have dramatic implications for the future and would be a heavy weight to carry for years to come. The situation in Tunisia is much better than in Egypt, where the deficit and the debt ratio are already very high, but the implications for debt sustainability are the same.

Finally, it is clear that the exchange rate could be a factor in debt sustainability. On the one hand, maintaining a fixed exchange rate at an overvalued level is harmful for the whole economy and is obviously

unsustainable. On the other hand, the devaluation of the currency can lead to serious implications for debt sustainability. The case of Egypt is worth mentioning, the sharp decline in the official reserves, combined with an appreciation of the real effective exchange rate over the past 10 years, reflect the urgent need for an exchange-rate correction. The recent depreciation is a step in the right direction, but the continuous interventions from the Central Bank can be harmful. The Gulf countries' deposits in the Egyptian Central Bank are absorbed by the market right away, leading to the need for more borrowing. The mismanagement of the exchange rate in Egypt is only leading to higher debt without any stabilisation of the market. Therefore, and in the absence of alternatives, the Central Bank should allow the exchange rate to float and depreciate. This will increase the debt ratio, indeed, but it will avoid accumulating more and more foreign debt, and ultimately having to devalue the currency, resulting in an even higher debt.

On monetary policy. There appears to be homogeneity in the operational framework followed by central banks, despite some differences in the specificities. Although price stability was announced as the final objective of the unconventional measures, errors in the monitoring and controlling of the interest rate forced monetary authorities to shift the intermediate objectives to targeting money supply and credit aggregates. The specificities are mainly visible in the oil-exporting countries (i.e. Algeria and Libya) that followed restrictive monetary policies controlling the monetary base to absorb the structural excess liquidity in the banking system. In the other countries, monetary authorities have adjusted their key policy interest rates to maintain positive real interest rates. In general, the low interest rates in combination with a broad range of monetary policy instruments revamped economic growth in most of the countries, except for the crisis countries (i.e. Tunisia and Egypt).

Low operational independence and a slow adjustment characterise the formal procedures that central banks in the region, with the exception of Turkey and Morocco, use to target inflation. Excessive use of subsidies and price controls seem to be the main obstacles to adopt explicit inflation targets. Turning to exchange rate policy, monetary authorities in a floating exchange rate regime in general target the real effective exchange rate, whereas they aim at a constant nominal exchange rate, if the currency is pegged or linked for example to the dollar or SDR.

While inflation in these countries usually depends on international energy and food prices as well as domestic tensions and demand, thorough econometric analysis suggests that inflation is determined by a combination of the items above and the monetary transmission channels.

However it appears that the adjustment mechanism of the interest rate is relatively weak, or the interest rate is slightly volatile in response to price fluctuations. In turn, active control offsets inflation corrections. Hence, the central bank interest is thus more important for exchange rate stability than the real stability.

To conclude we recommend the establishment of a (systemic) risk management system. In this context, an early warning system (EWS) and effective early prevention system was implemented in Tunisia to prevent systemic risks and crises. The system allows to: i) decompose the impact of shocks on the real economy and financial markets and ii) identify early warning indicators or estimate a binomial Probit model. These leading indicators have been grouped into three blocks related to i) macroeconomic resilience factors, ii) factors weakening bank (CAMELS accounting ratios) and iii) macro-prudential factors indicating the soundness of financial systems.

The results of the econometric analyses have generally shown that the early warning system clearly indicates that, in addition to the actual obvious effects, the probability of a negative impact of international financial crisis seem explained by the mechanisms of monetary contagion,: i) the risk of deteriorating terms of trade, ii) the risk of over-appreciation of the real effective exchange rate, iii) the swelling of compromised bank accounts and incidentally iv) excessive use of central bank refinancing.

On banking policy. The collective assessment of the regulatory and supervisory structures of the SEMCs in comparison with the EU-MED standards pre- and post-crisis gives a mixed picture. Despite some improvements, key weaknesses remain in deposit insurance, entry obstacles and legal rights. Moreover, some disparities have also become more apparent, especially in the potential for political interference and private monitoring.

The deposit insurance index has failed to improve between 2007 and 2013, because the Egyptian, Israeli, Palestinian, Syrian and Tunisian authorities have chosen not to put in place an explicit insurance scheme. Implicit schemes may enhance risk-taking through a blanket government guarantee for the leading institutions. In addition, in Algeria, Jordan, Lebanon and Morocco, no effort has been made to align the banks' incentives by implementing risk-based premiums or co-insurance schemes, which would help internalise some of the costs to the deposit guarantee schemes that stem from excessive risk-taking.

Another major issue, the presence of entry obstacles, continues to be a key weakness in the regulatory structures of the region. Although the

licensing requirements exhibit similarities in all countries bordering the Mediterranean, other indicators point at substantial barriers to entry. Government ownership, which is widespread in the region, gives undue advantages to incumbent banks and restricts entry incentives. In Algeria, Egypt and Syria as well as to some extent Morocco, Tunisia and Turkey, government ownership remains significant. Although government ownership may have some benefits, the authorities have to ensure that such roles are well-defined within a national strategy with clear objectives and instruments, and that they do not represent an obstacle to the development of the financial system. The rates of foreign denials are also still very high, further supporting the idea of substantial entry barriers and competitive advantages enjoyed by domestic incumbent banks.

In addition to the two key weaknesses summarised above, the 2011 survey points at three new concerns. Poor accounting practices have contributed to an increasing disparity in private monitoring indices. Furthermore, political interference has become a significant possibility, potentially undermining supervisory authority and reinforcing the governments' direct control – an additional concern for the competitiveness and efficiency of the banking sector (Casu & Ferrari, 2013). As the eruption of public discontent in Tunisia and Egypt in early 2011 clearly attests, the region's governments have attempted to maintain a tight grip on their countries' political and economic systems. It is exactly such forms of interference that may conflict with the objectives of the financial and competition authorities.

In contrast, the SEMCs have implemented a number of reforms to improve the availability and use of credit information by financial institutions. Egypt, and more recently Morocco, established private credit bureaus in 2006 and 2009, respectively. Algeria, Israel, Jordan, Lebanon and Tunisia continue to rely solely on public registries, three of them meeting all the criteria except collecting credit information on retail stores or utility companies. The same applies to Turkey, which has both public and private credit bureaus. Although the literature provides little guidance, private credit bureaus have better access to new technologies and know-how to ensure that information-sharing mechanisms work effectively.

1. INTRODUCTION

The global financial crisis, which started in the summer of 2007 and deepened in the aftermath of the Lehman bankruptcy in September 2008 led to a virtual collapse in economic activity and increased financial volatility worldwide. For the developing countries, the main channel of transmission has been a drop in external transactions, such as trade, financial and capital flows, and remittances. The emerging economies in the Mediterranean basin have also faced declining economic activity, although there seems to be considerable variation in the relative magnitudes and timing. Most of the economies in the southern and eastern Mediterranean countries (SEMCs) have taken a delayed but more durable response to the crisis, largely driven by their trade and investment ties with the EU and the Gulf Cooperation Council (GCC) countries.

Further to the potential effects of the global financial crisis, the Arab uprisings in several of the countries in the region and the resulting political instabilities have added to the socio-economic and financial woes of these countries. The simultaneity of the global financial crisis and the Arab uprisings makes it especially challenging to disentangle the effects of one on the other.

Much like their counterparts elsewhere, the economies in the region have implemented various initiatives in response to the crises. To a large extent, fiscal measures have been the instrument of choice, owing partly to the limited room for manoeuvre that the authorities have in these countries. While these policies appear to have been successful, they have exacerbated existing and future fiscal pressures.

These observations invite various questions on the effect of the crisis and the future of the Mediterranean basin countries. What are the economic and financial implications of the crisis, considering the different trade, fiscal, monetary and financial aspects of the economies? Has the crisis changed the focus of the reforms from undertaken in the pre-crisis era? What are the exit strategies and key challenges in the region in the post-crisis era? How will the new thinking on economic policy impact the future of reforms in these countries?

In answering these questions, the main aim of the study is to explore the fiscal, monetary and financial effects of the crisis in the region and to

provide in-depth analyses of the fiscal, monetary and banking policies in the post-crisis era, the viability of exit strategies and the prospects of macroeconomic and financial reforms in the region. These analyses will not only offer a comprehensive comparison between the countries but will also create a solid basis for assessing future economic and financial developments and policies in the region. A fresh, updated round of analyses in the post-crisis era is essential to produce an informed assessment of the future Euro-Mediterranean relationship and regional integration.

In order to comprehensively evaluate the impact of the crisis and crisis-management practices in the southern and eastern Mediterranean countries, the study examines a relatively broad sample of countries – comprising Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, the Palestinian Autonomy, Syria, Tunisia and Turkey – and uses a number of state-of-the-art methodologies, both quantitative and qualitative. The impacts are placed in the broader Euro-Mediterranean context. This approach allows us to contrast the different experiences of these countries and their relationships with the EU and other regions, such as the GCC countries when relevant, providing a rich set of observations, subject to the availability of data. Additionally, it helps researchers to draw lessons and develop case studies on policies that work and others that fail to produce the desired outcomes.

The study is composed of two mutually reinforcing parts. The first part provides an in-depth analysis of the impact of the financial crisis on the macroeconomic and financial conditions in the region, using a comprehensive framework of crisis-transmission channels. The second part, moving away from the analysis of the impact of the crisis, focuses more on the policy responses employed (or recommended) by each country and analyses future challenges and prospects.

Chapter 2 provides a comprehensive analysis of the macroeconomic and financial impacts of the financial crisis in the southern and eastern Mediterranean countries. The third chapter delves more specifically into banking and capital markets by assessing the potential contagion effects on the region of the global financial crisis. Chapter 3 also provides a novel and comprehensive analysis of the fiscal response and an assessment of different scenarios of fiscal sustainability, applied to the cases of Egypt and Tunisia, followed by a critical assessment of their policy responses to the financial crisis and political transitions. After outlining the monetary policy responses pre- and post-financial crisis, the fourth chapter provides an early warning system to prevent future crises. The fifth chapter assesses the

regulatory responses in the areas of banking and finance pre-and post-financial crisis. The final chapter offers conclusions.

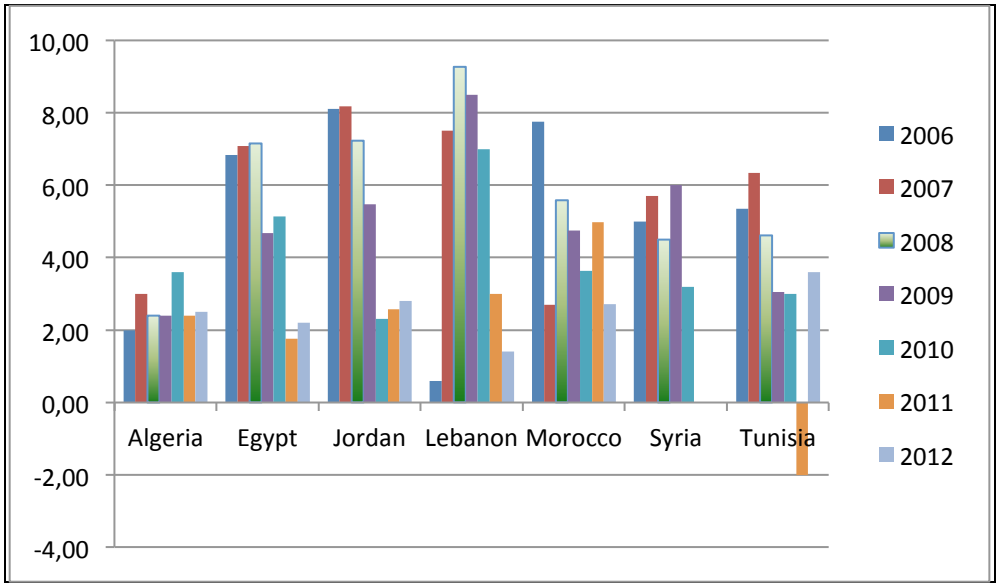
2. A MACROECONOMIC AND FINANCIAL OVERVIEW ON THE IMPACT OF THE CRISIS

DAMYANA BAKARDZHIEVA AND BASSEM KAMAR

While the global economic crisis has led to recession and negative economic growth in many parts of the world, its impact on the southern and eastern Mediterranean countries (SEMCs) was relatively mild. For those countries, the effect in 2009 and 2010 has been limited to a slowdown in growth rather than severe economic decline. Even though some economies in the region experienced negative growth for one or two quarters in early 2009, for the year as a whole, their economic growth rates were lower but remained positive (Habibi, 2009).

These initially encouraging signs could be explained by the fact that diversified economies with strong trade and tourism linkages with Europe and the OECD (e.g. Morocco, Tunisia and Egypt) entered the crisis in a relatively good macroeconomic position, which initially limited the effect of the crisis on their financial systems. However, most countries in the region later saw a significant impact on their real economies as recession deepened in their major export markets (Habibi, 2009). Furthermore, the protests that led to the political changes in Tunisia and Egypt have significantly disrupted their economic activity and have caused the IMF to revise downwards its 2011 growth forecasts and place them 2½–4 percentage points lower than in 2010, with the actual data standing at 1.6% and 1.9%, respectively, for the region for 2011 and 2012. Tunisia has recorded the only recessionary episode so far with -1.9% growth in 2011. The prolonged turmoil and insecurity in Egypt, exacerbated by the insecurity in Libya and Syria, are still undermining the region's capacity for economic rebound, and the mid-2013 IMF (2013) forecasts are for 2.7% growth for this year, with an optimistic projection of 3.7% for 2014 (Figure 2.1).

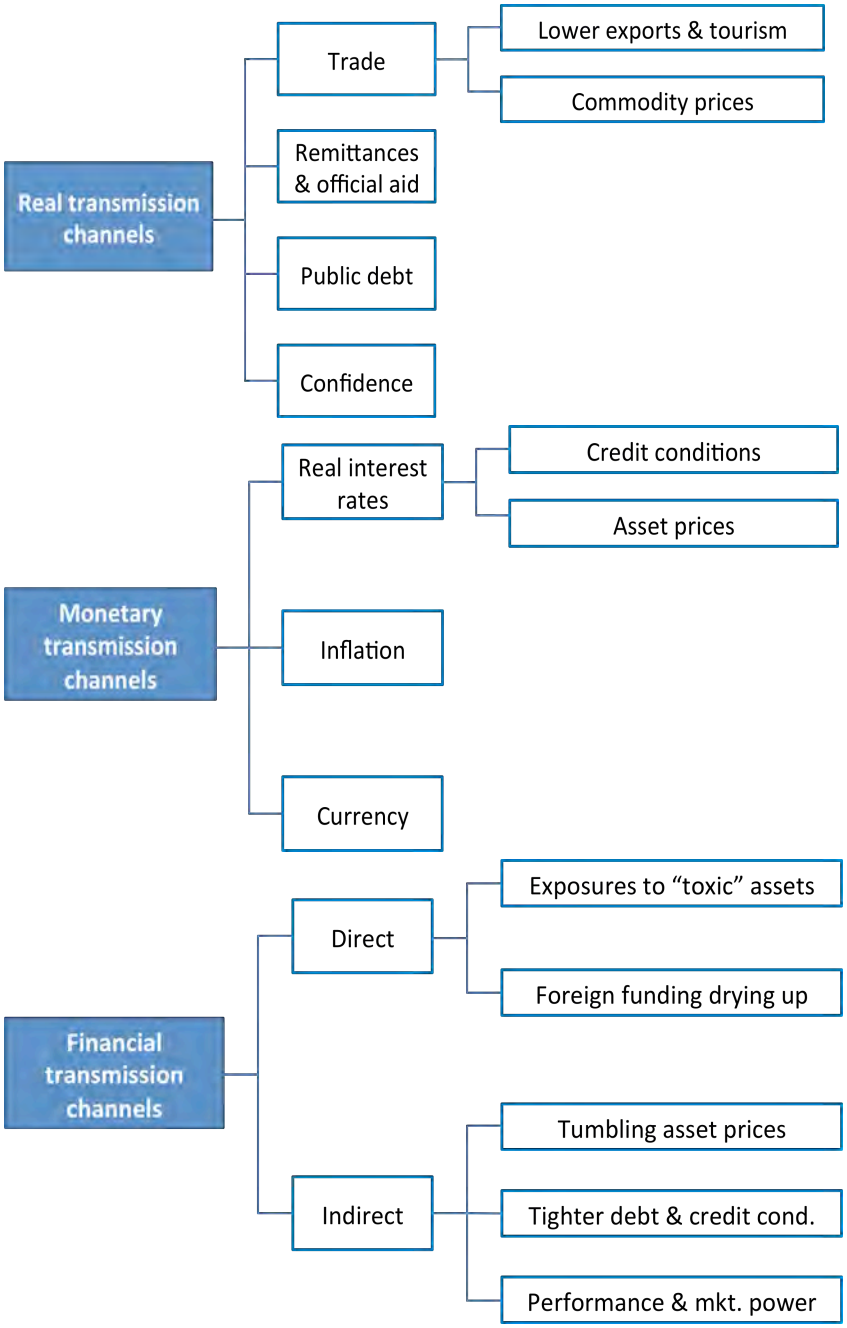
Figure 2.1 Real GDP growth rates for selected SEMCs, 2006-12 (%)



Sources: World Bank, World Development Indicators (WDI) and IMF World Economic Outlook (WEO) databases.

At the country level, the economic impact of the global slowdown has varied, depending on the degree of economic and financial integration. The relatively closed financial systems of most SEMCs protected them from the direct effects of the financial crisis. Their low level of international integration is also particularly apparent in their limited engagement in advanced manufacturing (IMF, 2009a). This sector relies on a highly specialised and intricate supply chain across the globe – which is extremely efficient, but also vulnerable to turmoil. In addition, much of the sector's output consists of capital goods and machinery, for which demand tends to be cyclical. Thus, the sector has become among those most affected by the global crisis. Its minor role in the region (except in Egypt and Tunisia) helps explain why these economies were initially relatively unharmed by the global crisis. Additionally, the countries' ability to attenuate external shocks has depended upon their available fiscal space as well as their institutional capacity to implement sound macroeconomic and structural policies.

Figure 2.2 Three crisis transmission channels



Source: Ayadi & De Groen (2013).

The purpose of this chapter is to use descriptive statistics to analyse the different transmission mechanisms through which the 2008 international financial crisis spread from its origins to the developing SEMCs. The channels have been grouped into three broad categories, including real transmission channels (i.e. trade, transfers, public finances, trade and commodity prices), monetary transmission channels (i.e. money supply, target interest rates and inflation) and financial transmission channels (i.e. capital markets and financial intermediation) (see Figure 2.2).

Although we don't aspire to cover in detail every single element of these channels, we will try to highlight the most important parameters of each one and track their development after the crisis.

2.1 Real transmission channels

As a result of the weakness in global demand, the tourism and export sectors have suffered, but government stimulus programmes have partly limited this decline. In fact, after enjoying solid economic growth for the period 2004–08, the SEMCs' economies grew at a slower but steady pace in 2009 and 2010, with the most affected countries being Egypt, Lebanon and Jordan and in 2011, Tunisia (IMF, 2009a).

2.1.1 Growth

The region's oil-exporting countries (Algeria and Libya) were initially expected to see a sharp deterioration in their fiscal and external balances while avoiding recessionary growth in 2009–10. According to IMF (2011) data, Algeria's real growth rate was 2.4% in 2009 and 3.3% in 2010, and prospects were increased to 3.6% for 2011 based on higher oil prices. The political and social unrest in Libya clearly led to adverse investor sentiment, lower domestic economic activity and higher external financing costs, causing the country's growth to slump 62.5% in 2011. But the economy vigorously rebound in 2012 with growth of 104.5% and expected an additional 20% increase in economic output in 2013 (Figure 2.1).

The Libyan revolution is also having important spillover effects in the economies of neighbouring Egypt and Tunisia through the channel of reduced remittances. More than 100,000 expatriates are estimated to have returned home since the beginning of the conflict.

Non-oil exporting countries with strong economic linkages with the GCC (Gulf Cooperation Council) countries and/or a dependency on aid (Jordan, Syria and Lebanon) faced stagnation of financial flows from the GCC countries and needed to mobilise aid because the source countries

were affected by crisis. Real GDP growth had fallen by 43% on average during the period 2009-11 in Lebanon and 63% in Jordan. The real growth rate for the group of oil-importing MENA (Middle East and North African) countries had declined from 4.9% in 2009 to 4.3% in 2010, and then even further to 1.6% in 2011 (excluding Syria, for which data are unavailable from 2011 onwards).

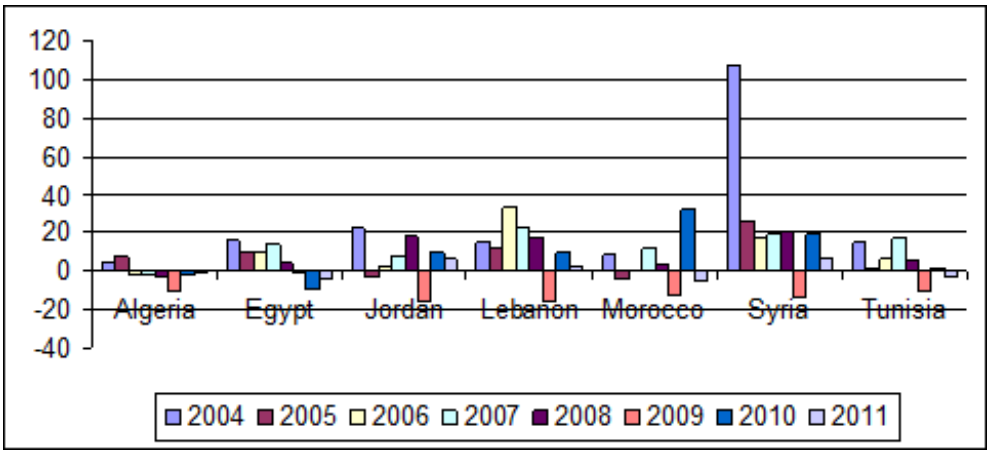
In 2012 and 2013, political uncertainty, continued social unrest and declining investor confidence decreased trade and investment, and increased unemployment, borrowing costs and capital outflows, providing altogether for weak growth, averaging about 2.7% (again excluding Syria).

2.1.2 Trade

The turmoil in international markets caused by the economic crisis has given rise to a significant decline in SEMCs' exports in 2009. Their foreign trade was unable to resist the adverse impact of the severe worldwide economic recession, and the drop in demand in Europe, the United States and Asia.

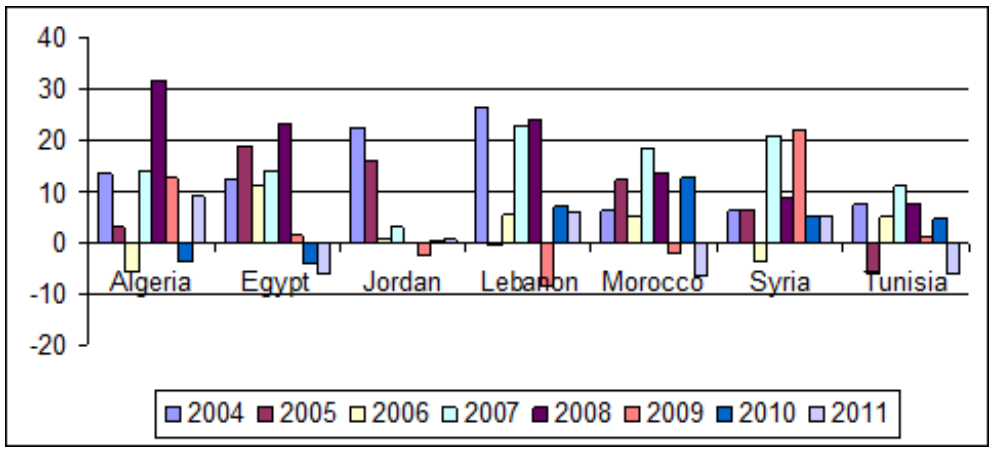
The decline in goods exports did not cause a deterioration in the current account balances of Tunisia, Jordan and Morocco in 2009. For these countries, the decline in oil-import costs was able to offset the decline in export revenues, and consequently their current account deficits were moderately smaller in 2009 as compared to 2008 (Figures 2.3 and 2.4).

Figure 2.3 Export of goods in selected SEMCs, 2004-11 (% change)



Sources: World Bank WDI and IMF WEO databases.

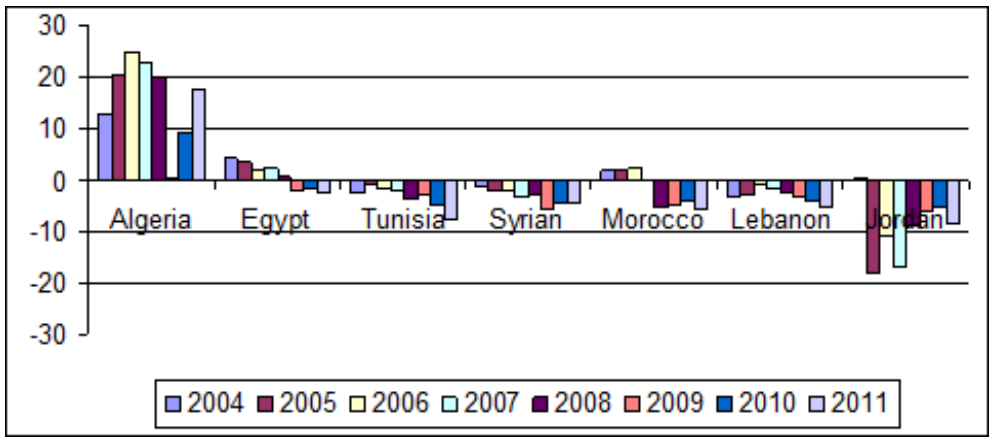
Figure 2.4 Import of goods in selected SEMCs, 2004-11 (% change)

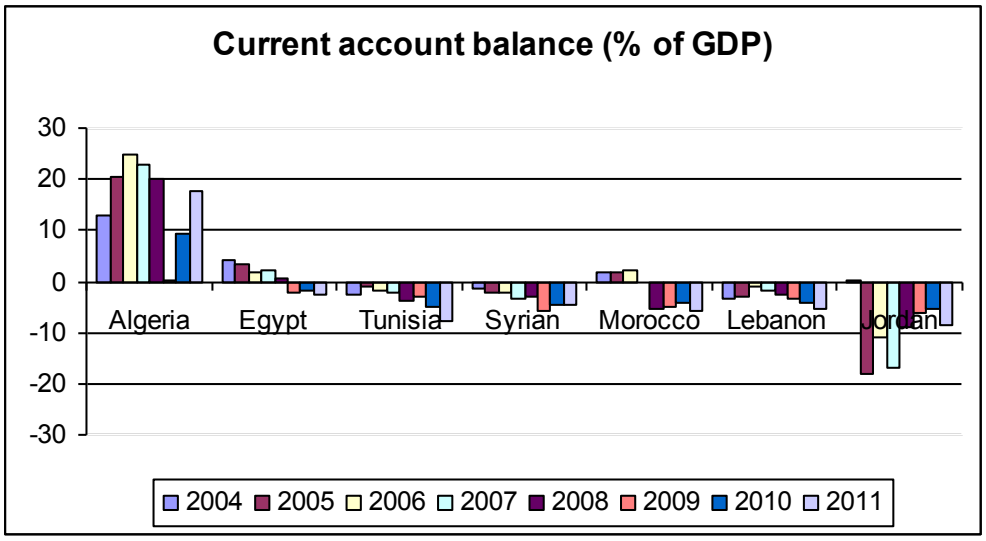


Sources: World Bank WDI and IMF WEO databases.

However, for these and the other SEMCs (except Algeria, which runs a surplus, and Syria), current account deficits increased in 2011 due to a larger decrease in exports as compared to imports (Figure 2.5). The increase in oil prices in 2011 generated an improvement in the current-account surplus of oil-exporting Algeria, but it has significantly increased the import bill in the other SEMCs.

Figure 2.5 Current account balance in selected SEMCs, 2004-11 (% of GDP)



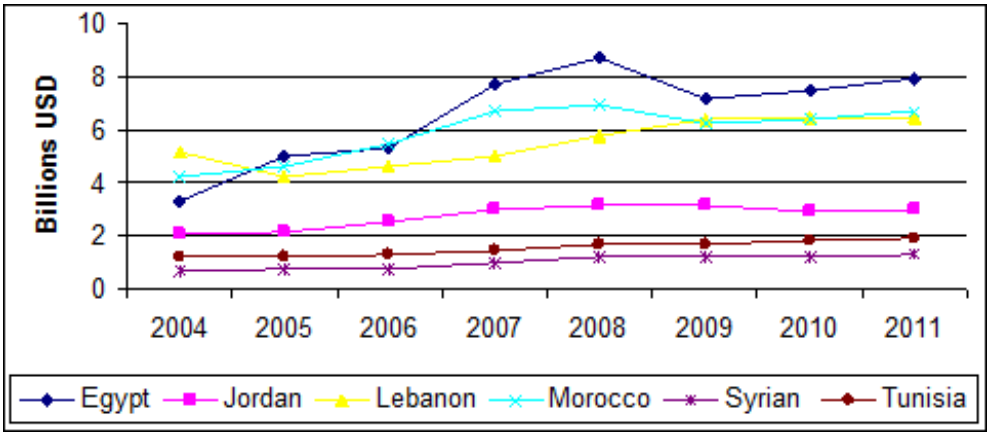


Source: World Bank WDI and IMF WEO databases.

2.1.3 Remittances

Remittances have also declined in 2009, but not as much and with significant variations across countries. For example, they have fallen by 24% in Egypt, while they only fell by 12% in Morocco (Figure 2.6). Migrant workers who still have a job continue to send money back home, and those who have lost their jobs are returning to their home countries with the stock of their accumulated savings. However, as already noted, the situation is particularly adverse for Egypt and Tunisia in 2011, due to the events in Libya and their own political crises.

Figure 2.6 Remittances inflows in selected SEMCs, 2004-11 ($ bn)



Source: World Bank WDI and IMF WEO databases.

The impact of the global recession on the Palestinian economy was also initially limited. While the global recession lowered growth in Israel, its impact on the West Bank and Gaza was limited by the small share of its exports in GDP. For now, donors decide when and whether to disburse payments based on domestic and political factors, rather than the global recession, and there are no indications of a significant decline in remittances from the Palestinian diaspora (IMF, 2009b).

2.1.4 Tourism

In 2009 tourism remained stable or was even growing in Jordan, Lebanon, Tunisia and Syria (Table 2.1). This fact reflects country specificities, such as the recovery from the 2008 unrest in Lebanon and the increased tourism from neighbouring oil-exporting countries (such as the GCC). The region's tourism industry has also benefited from the global trend among tourists to switch away from higher-cost destinations. Proactive policies oriented towards stimulating tourism demand have also proved useful. For example, in early 2009, Egypt adopted a set of measures aimed at invigorating tourism: hotels have been exempted from paying contributions to the country's Tourism promotion authority, and charter flights face lower fees (World Tourism Organization, 2009).

Table 2.1 Tourism receipts in selective SEMCs, 2000–2011 ($ bn)

Country	2000–2006 average	2007	2008	2009	2010	2011
Algeria	0.2	0.3	0.5	0.4	0.3	0.3
Syria	1.4	3.0	3.2	3.8	6.3	0.0
Lebanon	4.3	5.8	6.3	7.2	8.2	7.1
Egypt	5.6	10.3	12.1	11.8	13.6	9.3
Morocco	4.2	8.3	8.9	8.0	8.2	9.1
Tunisia	2.3	3.4	3.9	3.5	3.5	2.5
Jordan	1.4	2.8	3.5	3.5	4.4	3.9

Source: World Bank 2013 WDI database.

In 2011, however, due to political instability, tourism collapsed in Egypt and Syria, and the sector receipts declined by 40% in Tunisia. Although past experience suggests that the region's tourism recovers relatively quickly, the setback led to lower receipts more generally in the balance of payments and higher unemployment.

2.1.5 Unemployment

High unemployment indeed remains a major challenge in the region, averaging around 12% – the highest regional rate worldwide in 2008. The increased growth over the past decade did not generate enough jobs, nor was it inclusive, leaving youth unemployment at 25-30% in Egypt, Tunisia and Morocco. The young are also the ones most affected by unemployment among the different age groups, with up to 60% of unemployment being youth unemployment in countries like Egypt and Syria. Unemployment in SEMCs is mainly structural, due to the high growth rate of the population and subsequently of the labour force, lack of flexibility of the labour market, skill mismatches and low labour-force participation ratios (especially for women, as was stressed by Ayadi & El Mahdi, 2013). Recent data for unemployment remain scarce, but for 2012 the IMF estimates unemployment in Egypt and Jordan at above 12% and above 16% for Tunisia. All of these elements conspire to keep social discontent well nourished.

2.1.6 Public deficit and debt

As the economies of the SEMCs were affected by the global crisis, governments used a variety of measures, similar to those adopted by other governments worldwide, to attenuate the adverse consequences. In most

countries, this involved a mix of monetary and fiscal stimuli along with stricter financial regulations (Table 2.2).

Table 2.2 Key responses to the crisis in selected SEMCs

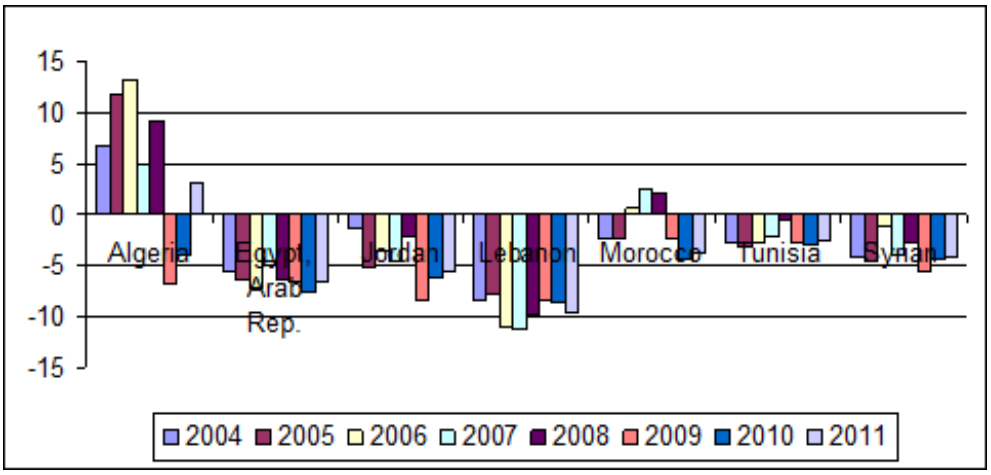
	Financial sector		**Macroeconomic**	
Country	**Deposit guarantee**	**Liquidity support**	**Monetary easing**	**Fiscal stimulus**
Algeria			*X*	*X*
Egypt	*X*		*X*	*X*
Gaza/West Bank				
Jordan	*X*	*X*	*X*	
Lebanon		*X*		
Morocco	*X*	*X*	*X*	*X*
Syria		*X*		*X*
Tunisia		*X*	*X*	*X*

Source: Authors' own compilation.

SEMCs have many fiscal challenges in the areas of deficit, debt reduction and the maintenance of fiscal discipline. However, most countries in the region face some specific fiscal issues, such as relatively high public debt,[1] dependency on some form of aid and financial concession, exposure to fluctuations in hydrocarbon prices, high defence expenditures and weak tax bases (Ben Slimane & Ben Tahar, 2010).

[1] Although, of course, there is a difference between countries whose debt is mostly domestically held and those whose debt is mostly external.

Figure 2.7 Central government fiscal balance in selected SEMCs, 2004-11 (% of GDP)



Sources: World Bank WDI and IMF WEO databases.

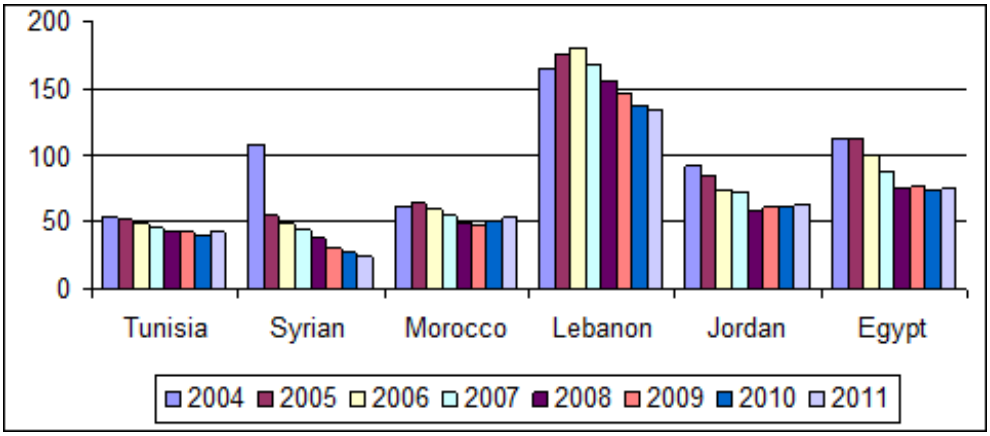
The general government-balance-to-GDP ratio in SEMCs has improved on average, even though some countries continue to exhibit large deficits (like Lebanon). This improvement is mainly explained by the positive development in the region's oil-producing economies (notably Algeria), which have accumulated large fiscal surpluses in the wake of higher oil prices (Figure 2.7).

Morocco, Tunisia, Algeria and Egypt had successfully accomplished their budgetary consolidation programmes and entered the crisis with a sound fiscal situation. Those countries were able to use their fiscal policy to smoothen the negative effects of the global crisis (stimulating internal demand through the increase in public expenditures). Creating fiscal space before the crisis allowed those countries to implement countercyclical macroeconomic policies by running fiscal stimulus programmes and the operation of automatic fiscal stabilisers.

Algeria and Jordan experienced significant fiscal growth in 2009. Egypt, Morocco, Lebanon and Tunisia, on the other hand, adopted smaller fiscal budgets for 2009 and 2010 in comparison with 2008. This is partly due to revenue constraints and high sovereign debt, which has discouraged additional borrowing. In general, fiscal stimulus programmes result in budget deficits – which, in oil-importing countries, must be financed by additional borrowing as no sovereign wealth funds are available. According to IMF estimates, Morocco's 1.8% fiscal surplus of 2007 and 2008

was replaced by fiscal deficits of 2.1% and 4.2% in 2009 and 2010, respectively, arriving possibly at 4.9% of GDP in 2011 (Figure 2.7).

Figure 2.8 General government gross debt in selected SEMCs, 2004-11 (% of GDP)



Sources: World Bank WDI and IMF WEO databases.

The decline of public debt in several SEMCs was the consequence of both debt rescheduling and macroeconomic stabilisation programmes. Nevertheless, Egypt and Lebanon still have debt-to-GDP ratios above or around 100%, and Jordan, Morocco and Tunisia have debt levels well above 50% of GDP. Lebanon faces a particularly challenging situation, as public debt is not only very high at 170% of GDP, but has also steadily increased in recent years (Figure 2.8). By contrast, oil-producing countries have used part of the windfall profits resulting from high oil prices to repay public debt.

Fiscal consolidation efforts could be a major part of the institutional reforms that might be affected by the global economic crisis and therefore postponed for a few years. While Morocco and Tunisia have some fiscal space thanks to moderate levels of public debt, and Algeria is still enjoying comfortable oil revenues; Egypt, Jordan, Lebanon and Syria have none left. Egypt might find it difficult to finance additional stimulus spending unless it can secure low-interest financing for the fiscal deficit and a significant amount of foreign aid. In Lebanon, where deficit and debt-to-GDP ratios are high and the cost of servicing domestic debt is already significant, the government may want to avoid adding to that cost. With falling fiscal revenues and tightening external financing conditions, domestic public debt can be an appealing alternative for financing fiscal stimulus packages, but it bears the risk of crowding-out the private sector.

2.2 Monetary transmission mechanisms

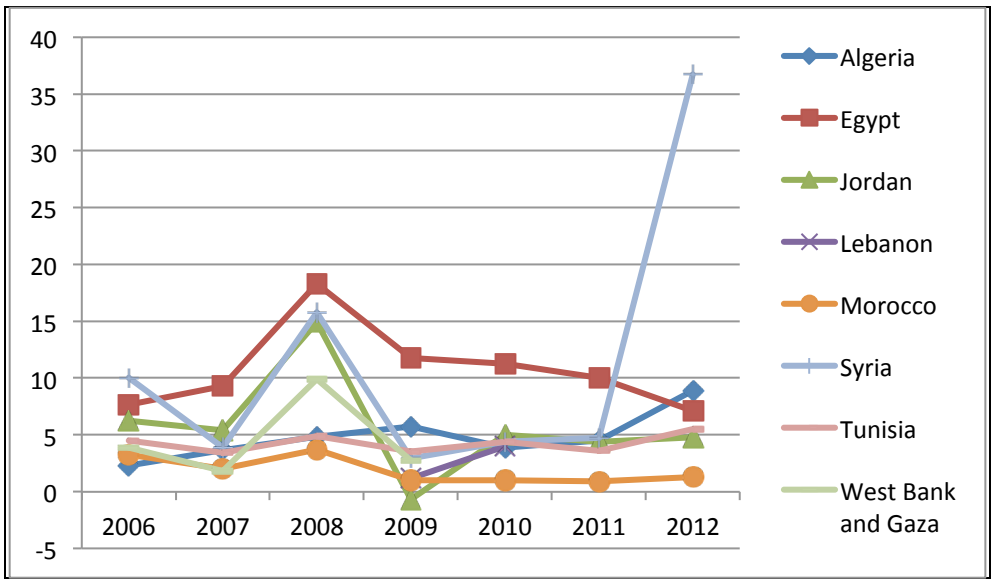
2.2.1 Inflation

Monetary stimulus in the region was quite uniform. During 2008, inflation moved into double digits in several countries linked to the price increases for food and fuel. Because the countries in the region are large importers of food, the inflationary impact of high international food prices was higher in the region than anywhere else in the world – with 25% of inflation in SEMCs between December 2005 and December 2007 attributable to international food prices, more than twice the level for the next-affected region (World Bank, 2009). The authorities undertook measures to offset the most adverse effects on the poor. These measures included increased subsidies, measures to boost incomes through higher civil service wages and finally an increase in interest rates in a number of countries to counter the inflationary impulse. For example, the Central Bank of Egypt increased the key policy rates by 275 basis points between February and September 2008.

The sharp decrease in commodity prices during 2009, however, lessened the concern over inflationary pressures. GDP growth below potential has helped the sharp decrease in inflation and helped create space for monetary easing. For example, in Tunisia the CPI inflation softened to 3.1% in February 2009, (year-on-year) from 4.9% during 2008; and in Jordan to 1.5% from 14.9% (Figure 2.9). This easing is serving to boost the purchasing power of the broader population in the region, setting the stage for an eventual turnaround in household spending, when economic conditions become clearer and more stable.

Despite the expansionary macroeconomic policies, inflation rates have continued to fall since August 2008, and have remained in the 5–10% range in most countries for the period 2009-12. Accordingly, in many countries, the authorities have lowered reserve requirements substantially.

Figure 2.9 Inflation rate in selected SEMCs, 2006-12 (% change in CPI)



Sources: World Bank WDI and IMF WEO databases.

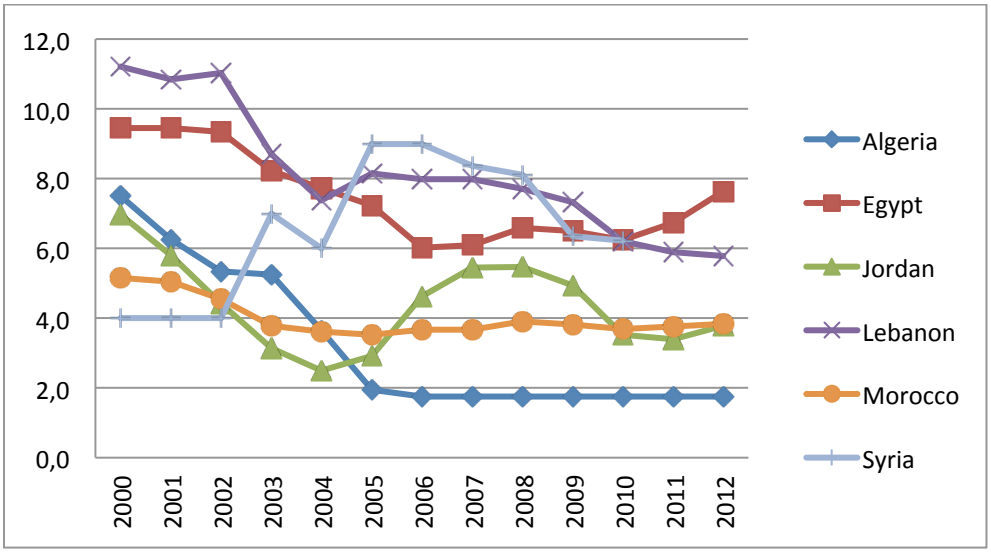
In 2011, however, inflationary pressures started building up again, against the background of rising world food, commodity and oil prices. The costs of imports were expected to increase by about 3% of GDP, which will later translate either into higher consumer prices (imported inflation) or a worsened fiscal balance (in case of price controls or government subsidies). A notable outlier in this general picture is Syria, where prices skyrocketed amidst the ongoing crisis to stabilise at little under 50% in the first quarter of 2013 (Economist Intelligence Unit, 2013).

2.2.2 *Interest rates*

Interest rates have remained relatively low, both internationally and in the SEMCs since the crisis, which is the result of the easy monetary policy applied in order to stimulate the world economies.

Reductions in policy rates have generally been more cautious and to a large extent dictated by exchange-rate considerations, because most SEMCs are targeting a steady nominal exchange rate.

Figure 2.10 Deposit interest rates in selected SEMCs, 2000-12 (%)

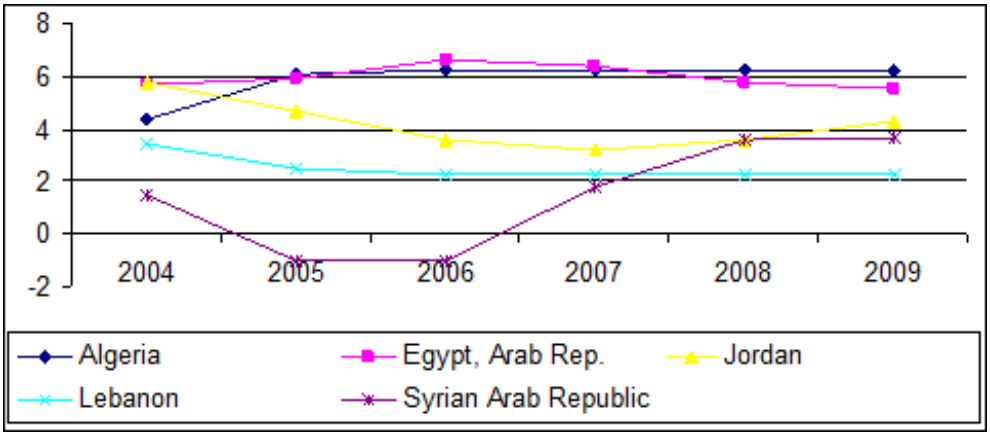


Source: World Bank WDI database.

In Egypt, the central bank has cut policy rates six times in 2009 alone to promote economic recovery and reiterated its 100% guarantee on local bank deposits (Economist Intelligence Unit, 2009). In Jordan, interest rates have been cut by 150 basis points since late 2008, and required reserves have been reduced from 10% to 7%. A temporary guarantee on bank deposits was issued in October 2008 as a pre-emptive step to maintain confidence and to support the domestic money market. In Morocco, the key policy rate has been reduced by 25 basis points and required reserves have been reduced from 15% to 10% since the start of 2009. In Tunisia, the required reserve ratio was lowered from 10% to 7.5%, and the key policy rate was reduced by 75 basis points (Figures 2.10 and 2.11).

Although inflation has remained relatively subdued this far (except in Syria), the situation isn't without potential threat, especially if international rates start increasing, which can jeopardise the SEMCs' capacity to finance their debt through further foreign borrowing.

Figure 2.11 Interest rate spread in selected SEMCs, 2004-09 (%)



Source: World Bank WDI database.

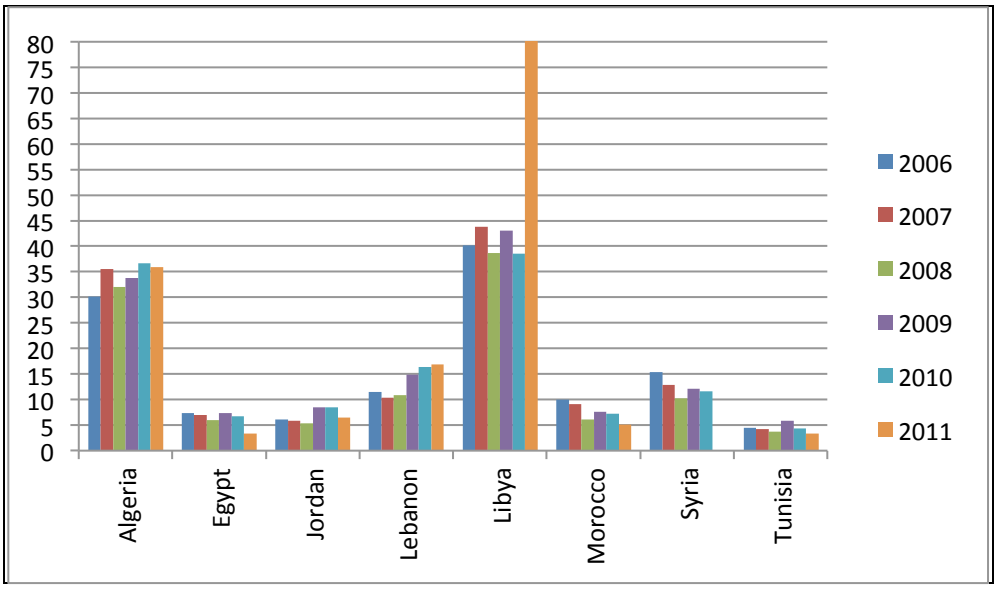
2.2.3 *Official reserves*

In general, the levels of official reserves remained stable during 2009 and similar to pre-crisis levels. They nonetheless fell slightly in a certain number of countries in 2010-12 (Egypt, Jordan, Morocco, Syria and Tunisia).

The situation even became critical in Egypt in 2012 with the central bank trying to prevent the Egyptian pound from depreciating, and allowing the level of official reserves in the country to fall under the internationally acceptable threshold of 3 months worth of imports, plummeting from $36 billion in 2011 to $9.6 billion in February 2013.

More recently, with the help of Libya, Qatar and later Saudi Arabia and United Arab Emirates, the Egyptian official reserves improved slightly, but they still stand at only $15 billion, which isn't really sufficient and leaves little room for central bank manoeuvres (Figure 2.12).

Figure 2.12 Official reserves in selected SEMCs, 2006-11
(in months of imports)



Sources: World Bank WDI and IMF WEO databases.

2.3 Financial transmission channels

For most SEMCs, the global financial crisis manifested itself mainly in decreased receipts from abroad. The crisis affected more directly the oil-exporting countries like Algeria, through a sharp drop in oil prices, a contraction in the global economy, and again a sudden drying up of capital inflows.

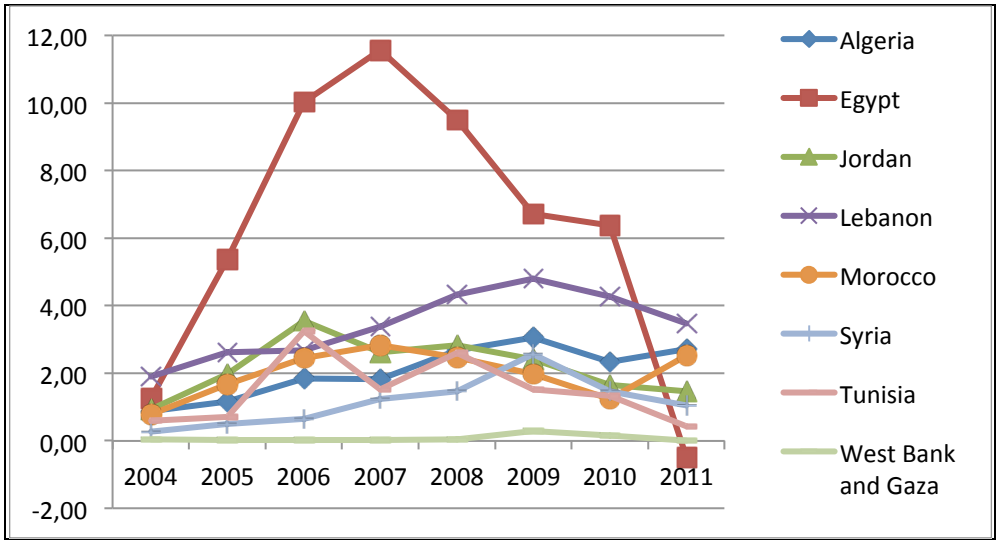
2.3.1 Foreign capital inflows

The net flows of foreign direct investments (FDI) have been particularly hard hit, declining on average by 35% in 2009. On the inflows side, the FDI declined roughly by 32%. Given the increased insecurity in the region, FDI has declined in both Egypt and Tunisia by 1-2% of GDP in 2011, possibly much more in Libya (Figure 2.13). The crisis in Syria and the ongoing turmoil in Egypt are creating negative spillover effects for the entire region, and this instability seriously undermines investors' confidence.

Portfolio investments have generally decelerated too, reflecting the slump in the global stock market and in the Middle Eastern bourses as

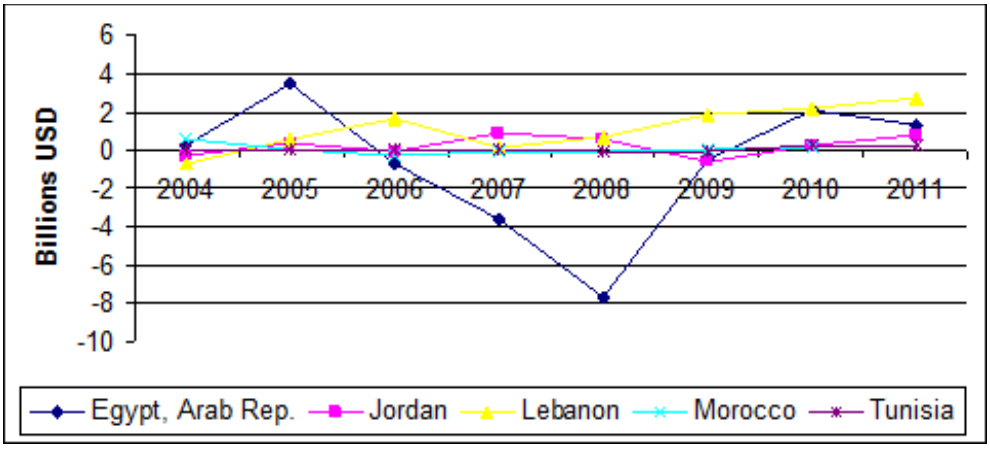
discussed below. As of 2013, they still remain lower than in other developing and emerging markets (Figure 2.14).

Figure 2.13 Net foreign direct investment inflows in selected SEMCs, 2004-11 ($ billions)



Source: World Bank WDI and IMF WEO databases.

Figure 2.14 Portfolio investments in selected SEMCs, 2004-11 ($ billions)

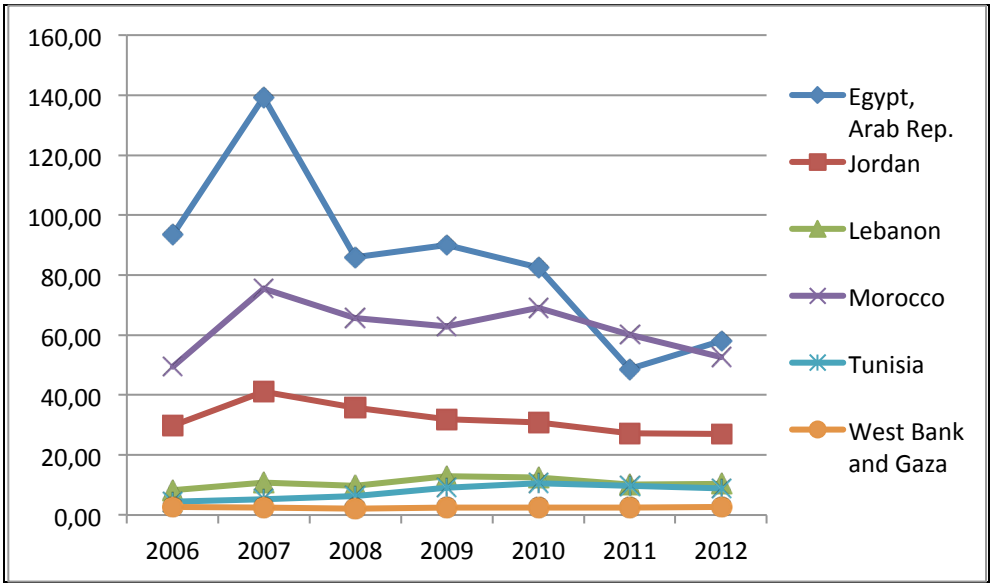


Sources: World Bank WDI and IMF WEO databases.

2.3.2 *Stock markets*

During the worst phase of financial turmoil in late 2008, global equity markets dropped 40% to 50%. The MSCI-all developing index was off 38% from September through year-end (World Bank, 2009) (Figure 2.15). The SEMCs followed this general trend, and the decline in stock prices is visible both in the main index performance and in the overall market capitalisation.

Figure 2.15 Stock market capitalisation in selected SEMCs, 2006-12 ($ billions)

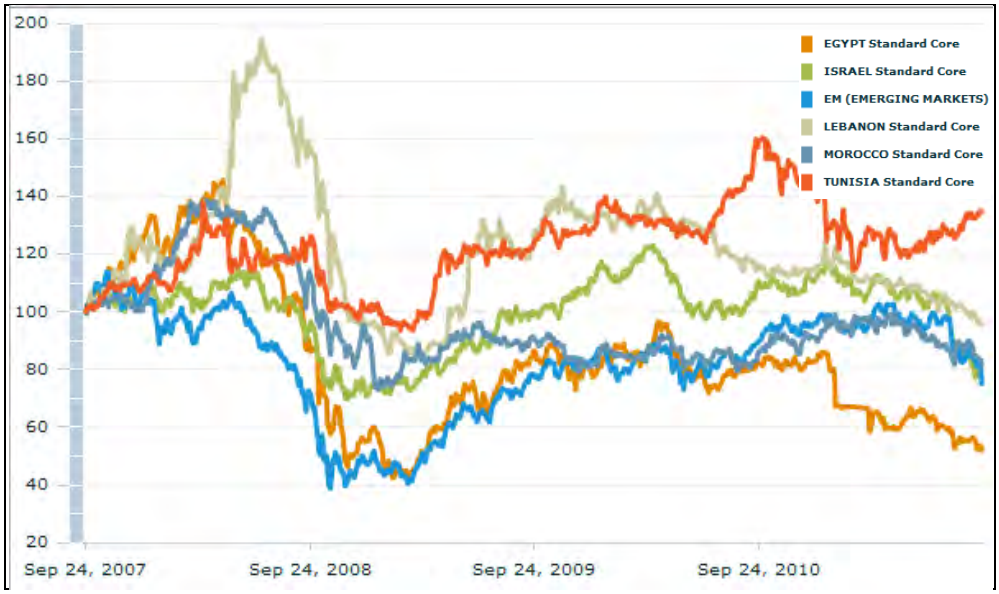


Source: World Bank WDI database.

Egypt was among the markets that saw the sharpest initial decline. The Egyptian index peaked at 12,000 in April 2008 before declining sharply to 4,300 in December and further to 3,563 in February 2009 (a 66.3% decline). Immediately after the Lehman Brothers episode, the Egyptian index fell by almost 30% in October (month on month), mainly due to panic selling from local and foreign investors. In Jordan, the Amman Stock Exchange index, declined by 9% in July and August before plunging 35% between August and December 2008 in the midst of the financial turmoil. Tunisia appears to have avoided a sharp decline in its major stock index. Although Tunisia's stock market recorded a significant downturn between October and December 2008, the Tunis Stock Index rose by 1.8% for the whole of 2008 and kept rising during 2009.

Since March 2009, SEMCs' financial markets have begun to turn around with partial recovery after the large drop in the major stock market indices (Figure 2.16). Markets in the region have generally outperformed the MSCI Emerging Market, except for Egypt and Morocco in 2010 and 2011.[2]

Figure 2.16 Stock exchange indices in selected SEMCs, 2007-10



Source: MSCI.

The financial market conditions in Egypt and Lebanon outperformed expectations at the end of 2009, with the Egyptian stock index almost doubling since its low in early 2009. However, the performance of the Egyptian stock exchange was significantly worsened since the democratic revolution in January 2011, with the index falling 25% in the first three months of 2011.

Tunisia's index, as noted above, was hardly affected by the crisis, and went close to its record high in 2009. Furthermore, although volatility increased temporarily towards the end of 2010 to accompany a marked

[2] See the MSCI website for the latest developments in the region's performance (www.mscibarra.com/products/indices/international_equity_indices/acwi-imi/performance.html).

trend reversal, the Tunisian stock index registered significant growth in the second half of 2011.

Although the stock indices in Egypt and Tunisia have recovered some of their losses in 2012, the markets in Jordan, Lebanon, Syria and Morocco keep declining. The June 2013 revolution in Egypt was accompanied by impressive increases in the Egyptian stock exchange index, which might seem strange at first glance, but which many experts interpret as a sign that investors foresee more stability after the recent changes.

2.3.3 Bank assets

No major financial institution in the region has failed in the immediate aftermath of the crisis. In addition, credit growth has remained positive, in line with the subdued decrease in output. The region's mainly bank-based financial systems were well capitalised and avoided significant exposure to US subprime or other structured securities. Moreover, reinforcing confidence, Jordan instituted a guarantee on bank deposits, while Egypt reiterated an existing implicit guarantee and in 2009 even announced plans to launch an explicit deposit insurance fund scheme (Al Jafari, 2009).

Table 2.3 Financial soundness indicators in selective SEMCs, 2009 and 2011

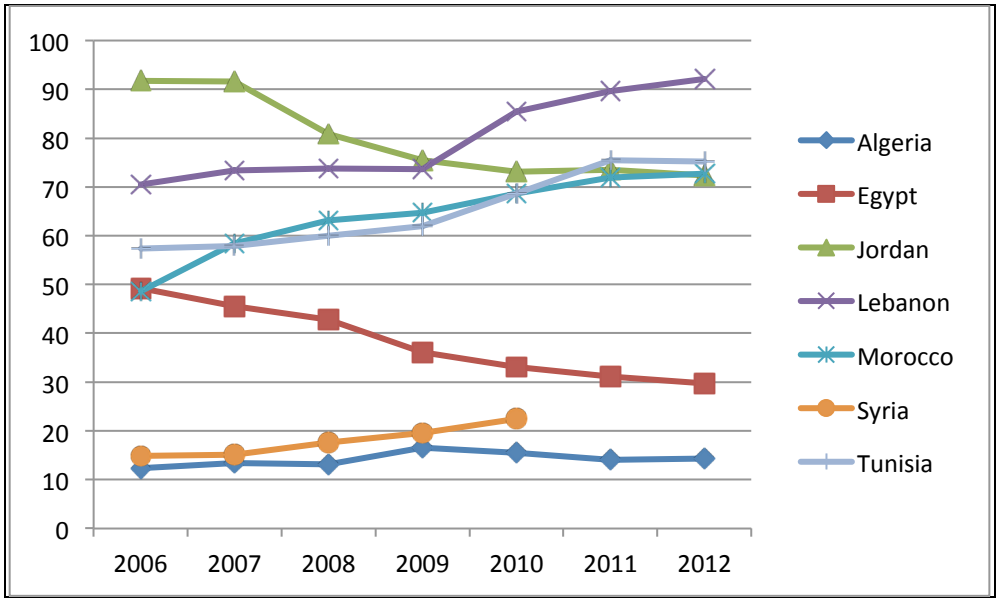
	Capital adequacy ratio 2009	**Ratio of non-performing loans to total loans**	
		2009	**2011**
Algeria	18.4	22.1	n/a
Egypt	15.3	14.7	10.9
Jordan	19.6	6.7	8.5
Lebanon	12.4	2.1	3.7
Morocco	11.2	6.0	4.8
Syria	20.8	5.1	n/a
Tunisia	12.4	13.2	n/a

Source: Author's compilation based on IMF and WB databases.

The banking systems have absorbed the initial systematic stress, helped by the authorities' actions and strong profitability in the pre-crisis years. Overall, banks have remained solvent and profitable in 2008 and 2009. Capital adequacy ratios have continued to be well above the required regulatory norm, and in many countries, the ratio of non-performing loans

has remained low. However, banking asset quality is reported to have decreased in 2012 in Jordan, Tunisia and Lebanon (IMF, 2012) (see Table 2.3).

Figure 2.17 Credit to private sector in selected SEMCs, 2006-12 (% in GDP)



Sources: World Bank WDI and IMF WEO databases.

With deposit growth and capital inflows regaining rapidly strength, funding conditions in the banking systems have also improved shortly after the crisis onset. Private sector credit in Algeria rose 19% year-on-year as of June 2009 (IMF, 2010) as shown in Figure 2.17. This indicator, however, has not improved significantly in other countries, reflecting increased risk aversion, difficulties in raising sufficient capital and increased supervisory scrutiny. The danger here today comes from the possible crowding-out effect due to the decreased availability of foreign financing for the cumulating government deficits that now have to be mostly domestically financed.

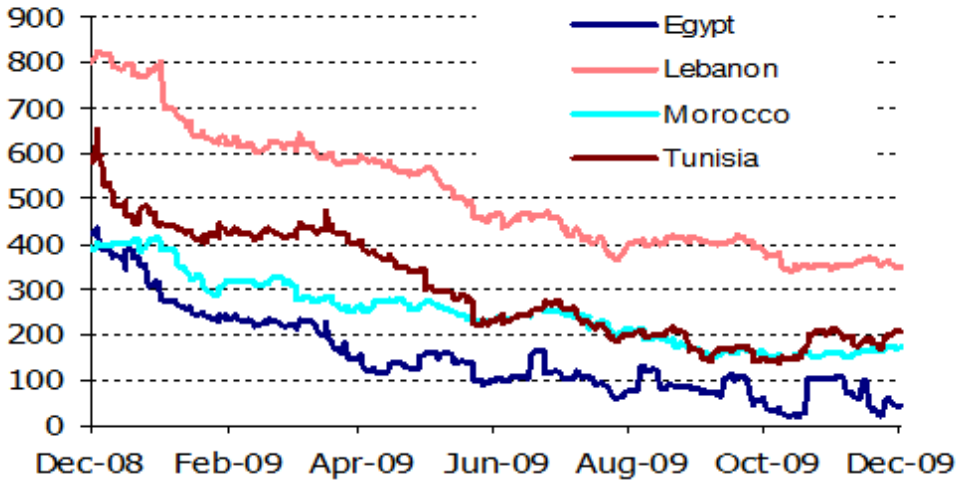
2.3.4 Sovereign debt markets

The costs of external debt for emerging countries on international financial markets started to increase in July 2007. The spreads remained moderate, however, until the beginning of the financial crisis. Tunisia was the first to feel the burden of the crisis in its attempt to issue bonds on international financial markets in July and August 2007. Faced with debt spreads

estimated at between 45 and 50 basis points, the country had to increase its offer by 25 basis points to attract investors (ADB, 2009).

As the financial crisis kept unfolding, it amplified the increase in the margin applied to loans in the international financial markets for emerging countries. From October 2008, sovereign debt spreads rose by an average of 250 basis points for emerging countries. The spread of the JPMorgan emerging countries equity index reached its highest level since 2002, increasing by 800 basis points in October 2008. Spreads increased by 100 basis points for Egypt and rapidly increased to above 200 basis points for Tunisia during the toughest periods of bank failures in the United States (Figure 2.18).

Figure 2.18 Sovereign credit spreads, 2008-09 (basis points)



Source: Bloomberg.

Tunisia's sovereign spreads increased dramatically to more than 600 basis points as of December 2008, reflecting higher country risk resulting from the volatile global financial environment. Still, Tunisia's sovereign spread remained below the regional average (close to 900 basis points) and below Lebanon's spread.

Table 2.4 Long-term sovereign credit issuer rating (as of end of 2011)

Issuer	Moody's current rating	Action	Date	S&P rating	Fitch rating

Government of Lebanon	B2	Upgrade from B3 (2008)	1-Apr-09	B-	B
Government of Egypt	Ba2	Downgrade from Ba1	31-Jan-11	BB	BB
				(downgrade from BB+)	
Government of Morocco	Ba1	New	25-Jun-07	BB+	BBB-
Government of Libya	--	--	--	BB	B
				Downgraded twice	
Government of Jordan	Ba2	Downgrade to negative outlook	21-Aug-03	BB+	
Government of Tunisia	Baa3	Downgrade	19-Jan-11 (was unchanged since 2003)	BBB-	BBB-

Sources: Fitch, Moody's and S&P.

Spreads on sovereign credit issues in the region have fallen since their peak in the last quarter of 2008, and the sovereign credit ratings have generally improved throughout 2009 and early 2010.

However, the Dubai debt restructuring in 2010 and the Arab spring in 2011 caused investors to re-evaluate the risk of SEMCs' sovereign issues and to raise borrowing costs for the region. Thus, between January and March 2011, government bond spreads increased by 30-50 points in Lebanon and Morocco, and by over 100 points in Egypt and Tunisia. CDS spreads followed a similar movement, but remained narrower than their post-global financial crisis levels.

Credit ratings kept worsening starting from 2011 with numerous logical downgrades for Libya, Tunisia and Egypt, which also negatively affected their neighbouring countries' outlooks (Table 2.4).

In May 2012, Standard and Poor's estimated that high political risks and limited monetary policy flexibility constrain the sovereign credit ratings of the MENA region, and gave negative outlooks to Egypt, Jordan and Tunisia. The average rating of the region today is close to BBB+.

Table 2.5 Total gross external debt SEMCs, 2004-11 (% of GDP)

	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Algeria	25.6	16.7	4.8	4.2	3.3	3.3	2.8	2.2
Egypt	37.9	32.2	28.8	23.0	20.8	16.8	14.6	
Jordan	66.1	56.5	49.3	43.6	22.6	21.7	19.1	16.5
Lebanon	187.4	185.7	198.8	194.0	172	171	160	161
Morocco	29.1	24.2	23.9	23.7	20.6	23	24.5	25
Syria	73.3	23.4	19.2	14.5	10.4	10.4	9.1	8.1
Tunisia	69.1	62.1	59.6	56.6	48.8	48.1	47.9	46,4

Source: IMF International Financial Statistics (IFS) database.

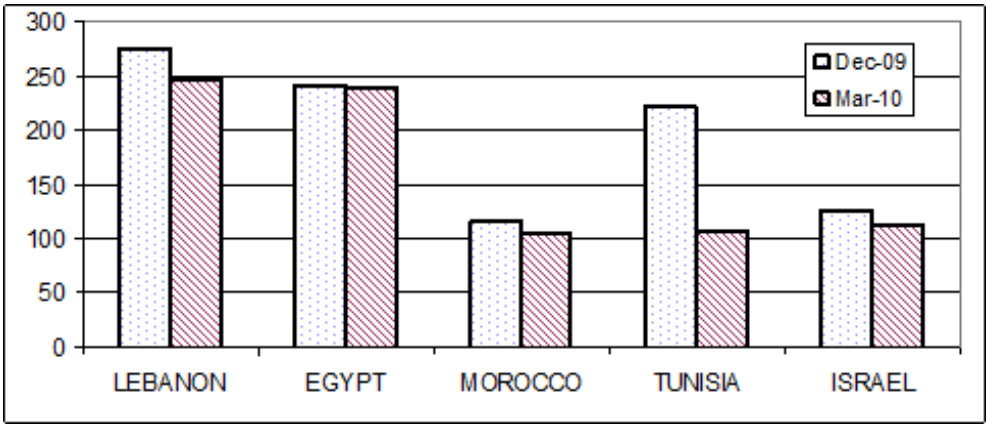
Historically, the volume of external financing has been relatively insignificant across the SEM region (Table 2.5). The total value of external bond issuance has been relatively low except in Lebanon.

As of end 2011, Lebanon has been the only country in our sample to issue external bonds after the crisis. A big portion of the Lebanese issue was locally purchased. The country enjoyed a B3 rating by Moody's and B- ratings by Standard and Poor's and Fitch as sovereign debt issuer in 2006 and 2007. As the crisis unfolded in 2008, its rating was reduced to CCC+ by S&P, but by December 2009 it was restored to its B- standing and even got an upgrade by Moody's to B2 level.

In Egypt, a Eurobond issuance scheduled for the first quarter of 2008 was postponed to July 2008 and then postponed again until international markets stabilised. Although emerging-market bond issuance was recovering from a near-standstill at end-2008, none of the countries in the group – except probably Lebanon and Egypt – had plans to reach out to the international bond markets in 2009-10.

While access to international capital markets remained limited, the cost of external borrowing had declined in 2010, as indicated by the decreasing cost of insuring against default of the debt issued by our sample countries.

Figure 2.19 Credit default swaps in selected SEMCs



Source: Bloomberg.

Nevertheless, the crises in Egypt, Tunisia and Syria in 2011, coupled with the euro-area debt crisis, inverted this trend, and by 2012 the credit default swaps in the region had widened significantly, although not as much as in some other regions of the world (Figure 2.19).

The switch to domestic or official sources to finance the deficits appears to have taken place smoothly, in sharp contrast to what has occurred in some other emerging markets, where sudden stops of capital inflows have had severe consequences. This is not surprising, given the limited dependence on external private financing described above, and the relatively deep local debt markets. At the same time, as private credit growth has slowed, the relative ease with which most governments in the group have been able to finance fiscal deficits at home may reflect reduced competition for funds.

Looking ahead, the SEMCs need to be cautious, however. If fiscal balances do not improve as the global and regional recovery progresses, interest rates are likely to rise with greater private-sector demand for capital. Given ambitious plans for bond issuance in industrial countries, the future cost of capital is also likely to go up with the anticipated increase in US treasury yields.

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3. AN INVESTIGATION INTO FINANCIAL DEVELOPMENT AND CONTAGION

RYM AYADI, EMRAH ARBAK AND WILLEM PIETER DE GROEN

The direct impact of the financial crisis on the banks and capital markets in the Southern and Eastern Mediterranean countries (SEMCs) has been limited. Most banks in the region held only limited interests in the toxic assets that sparked the world financial crisis. On the other hand, however, financial institutions and the capital markets in the region were deeply impacted from the indirect effects of the financial crisis, such as the reduction in the capital inflows.

This chapter begins with a review of the literature on the impact of asset bubbles on banks and capital markets in emerging economies. We then assess the impact of the financial crisis on the liquidity, performance, efficiency and fragility of the banking sectors in 10 selected SEMCs. Thereafter, the impact of the financial crisis on the capital markets is investigated using a state-of-the-art contagion analysis. The chapter concludes with a synthesis of the results.

3.1 Literature review

The literature on the impact of crisis conditions on the efficiency of financial institutions is relatively sparse. Studying the impact of the bursting of the asset bubble in Japan during 1990, Fukuyama (1995) provides some indirect evidence that the collapse of Japan's bubble economy in 1990s had some (albeit limited) negative impact on bank efficiencies, mainly through the creation of bad loans. More directly, Isik & Hassan (2003) focus on the 1994 Turkish financial crisis to find that various measures of efficiency and productivity have declined in the midst of the crisis in the banking sector, especially for the foreign-owned banks and mostly due to a deterioration of the technological frontier. A more recent study by Sufian (2010) also provides evidence of increased inefficiency

among Malaysian and Thai banks in the year following the 1997 East Asian financial crisis.

Several reasons may be put forward to explain why the global financial crisis may have had a negative impact on the banking sectors. A substantial degradation in external demand may translate into increased credit risks, especially in export- or tourism-reliant economies, and a loss of collateral for borrowers, making it harder and ever-more costly for banks to screen and monitor borrowers, (Mishkin et al., 1997). Moreover, as macroeconomic weaknesses arise and banks find themselves in increasingly precarious positions, they may try to offset their own risks by curtailing credit and turning to more-liquid but lower-earning assets. A banking crisis is particularly more likely with large open currency positions or in economies that are dependent on external finance and may suffer severely by sudden stops in foreign funding (Calvo, 1998; Kaminsky & Reinhart, 1999).

The theoretical literature on the promulgation of financial crises, on the other hand, is large and expanding (Claessens & Forbes, 2001; Pericoli & Sbracia, 2003; Dungey et al., 2004; Dungey & Tambakis, 2005). Apart from advanced-country studies, several studies have covered emerging markets, in many cases single countries. Regional or multi-country studies are only beginning to appear since the early 2000s, motivated by the fact that geographical proximity can be an important factor in the speed and the severity of the crises.[3]

One of the main challenges in assessing the severity of financial spillover effects is defining exactly what contagion means. Arguably the simplest explanation is the consequence of shared risks and the ensuing cross-market portfolio rebalancing (Kaminsky & Reinhart, 1999; Kodres & Pritsker, 2002). In this manner, contagion is a rational response by cross-border investors to hedge risks and limit exposures to common market fundamentals. In a similar vein, the recent financial crisis has amply demonstrated the spillover risks from cross-border linkages between financial institutions and large corporations. Allen & Gale (2000), Freixas et al. (2000) and Brunnermeier & Pederson (2009) show that idiosyncratic

[3] The recent studies have to a large extent focused on the transmission of emerging market crises, including the Mexican crash of 1994, the East Asian crisis of 1997-98, the Russian bond default of 1998, the Argentinean crisis of 2001-02 and more recently the global financial crisis of 2007-09. For examples of studies with large cross-country or regional samples, see Forbes & Rigobon (2002), Dungey et al. (2002), Longstaff (2010), Aloui et al. (2011) and Hwang et al. (2011).

risks and rumours of fragility may drive financial institutions to vastly scale down their lending and liquidity support to institutions in troubled markets. A large crisis may also lead to wealth effects through heavy losses for traders, who then liquidate their positions in their portfolios, both domestic and cross-border, leading to a collapse in asset prices (Kyle & Xiong, 2001). Alternatively, Calvo & Mendoza (2000) show that global crisis may reduce the relative gains from information-gathering during troubled times, increasing information asymmetries and resulting in herd behaviour among investors. For example, declining asset prices for assets in one country can lead to margin calls for leveraged investors, which can intensify their sell-offs in other unrelated markets due to fears of further sell-offs (Calvo et al., 2004).

The propagation of crises in the Middle East and North Africa (MENA) region has been the subject of several regional studies. Khallouli & Sandretto (2010) use a Markow-Switching generalised autoregressive conditional heteroscedasticity (GARCH) model to assess whether the US subprime crisis of 2007 has led to a significant bear markets for eight MENA countries. The results show that a persistent shift to a low-returns or a high-volatility regime did take place in many countries (except Jordan), especially after the fall of Lehman Brothers in September 2008. In particular, Bahrain and Egypt has experienced both mean contagion (i.e. lowering returns) and variance contagion (increasing volatility). In turn, the contagion to Morocco and Turkey has only resulted in lower returns. Meanwhile, Oman and Dubai have experienced significant increases in volatility without equivalent drops in returns.

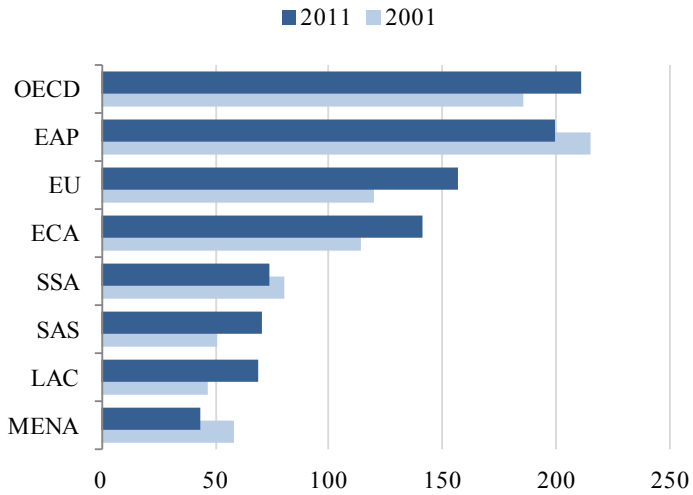
3.2 Impact of crisis on banking sectors

Bank-based funding remains the primary source of external financing for private (and public) sectors across the Southern and Eastern Mediterranean. Nevertheless, the share of domestic credit to the private sector remains lowest among other global regions (Figure 3.1), ranging from a high of around 100% in Israel to a low of around 10% in Libya, (Table 3.1). An underdeveloped banking system may have two offsetting implications. On the one hand, banks in such systems often have more than adequate funding in the form of retail deposits, with little or no need for market funding. They often invest in safe assets, such as government bonds or debt, which carry little credit or liquidity risk. Indeed, as will become clear below, credit to households does not constitute a smaller proportion of balance sheets than in more advanced systems. In short, despite some exceptions, an underdeveloped banking system implies that changing

economic conditions have little impact on asset valuation or funding availability.

On the other hand, firms in underdeveloped banking systems have to rely on funding from alternate sources, such as informal lenders, family and friends, or simply by retaining profits. The availability of funds from these sources is likely to be curtailed when economic conditions increase the credit risks faced by the informal lenders. The result is often a strong form of credit rationing, leading to a secondary rise in default likelihoods across all credit-needy firms. These self-fulfilling conditions will also enhance the risks borne by banks, more so than a more formal system that has the tools to diversify those risks and handle the information asymmetries, (Prasad, 2010). Thus, the secondary economic impact of a crisis to the banking system may be amplified in underdeveloped systems.

Figure 3.1 Domestic credit to the private sector, regional comparison, 2001 and 2011 (% of GDP)



Note: OECD: Organisation for Economic Co-operation and Development; EAP: East Asia and the Pacific; EU: European Union; ECA: Eastern Europe and Central Asia; SSA: Sub-Saharan Africa; SAS: South Asia; LAC: Latin America and the Caribbean; and MENA: Middle East and North Africa.

Source: World Bank, World Development Indicators (WDI) database.

Table 3.1 Domestic credit to private sector, 2004-11 in selected SEMCs vs other countries (% of GDP)

	2004	2005	2006	2007	2008	2009	2010	2011

Algeria	11.2	12.1	12.3	13.4	13.2	16.5	15.6	14.8
Egypt	54.0	51.2	49.3	45.5	42.8	36.1	33.1	31.3
Israel	85.1	89.8	86.5	97.4	99.8	93.5	95.7	95.1
Jordan	74.7	88.1	91.8	91.6	80.9	75.5	73.2	73.5
Lebanon	75.9	68.5	70.5	73.4	73.8	73.6	85.5	89.6
Libya	10.3	7.7	6.6	6.0	6.8	10.9	..	..
Morocco	42.6	46.2	48.6	58.4	63.2	64.7	68.6	71.2
Syria	11.7	14.8	14.9	15.1	17.6	19.6	22.5	..
Tunisia	59.0	58.3	57.3	57.8	59.9	62.2	68.8	76.4
Turkey	17.3	22.2	25.9	29.5	32.6	36.5	44.2	50.0
France	90.6	92.7	98.4	105.6	108.8	111.5	114.2	116.2
Greece	70.8	79.6	85.2	93.9	97.4	94.3	118.6	121.9
Italy	84.8	89.0	94.5	100.6	104.8	111.0	122.8	122.4
Spain	124.9	145.7	167.0	187.9	202.8	212.1	214.4	205.9
Europe & Central Asia	21.9	26.4	32.0	38.7	42.9	46.0	46.0	47.3
European Union	109.4	114.8	121.2	129.2	136.0	141.3	139.8	136.0

Source: World Bank, World Development Indicators (WDI) database.

A review of the economic and financial developments in the region during and following the 2007-09 global financial crisis and the ongoing sovereign crisis in many advanced countries, including the region's chief trade partners such as the EU and the US, reveals three underlying themes, at times overlapping, during the years 2007 and 2012.

First, many economies and financial systems have been saved from the initial negative impact of the crisis during the initial phase of the crisis between 2007 and 2008. Banks in the region had little direct exposure to the toxic products that weakened the balance sheets of many banks in the US or the EU. As noted above, the banking systems in the region are relatively small and external financing is not the principal form of funding, with many enterprises relying on own capital or retained earnings. Most banks are almost exclusively deposit-funded, reducing their reliance on foreign markets. Lastly, several countries have a substantial proportion of publicly-owned banks, for which credit provision is less elastic to underlying economic conditions but more on the well-connectedness of the borrowers.

Second, for many SEMCs, the main impact of the global financial crisis came later, during 2009 and afterwards. As economic conditions in the EU – the region's main partner – worsened, so did the external demand for the region's products, leading to drops in exports, tourism receipts and remittances. In addition, bouts of risk-aversion among global investors lowered capital inflows. To cope with these external imbalances, local authorities devised economic stimulus programmes of their own. However, the responses remained relatively inadequate for most – but not all – energy importers across the region due to an inappropriate spectrum of available tools or restrictive fiscal space. The consequent current-account deficits and lower capital inflows led to crisis conditions through currency instability, undermined fiscal conditions and prepared the ground for the widespread civil unrest across the region. Many banking systems in the region contracted, facing increased currency risks (where such imbalances have built-up) as well as sharp drops in asset quality, profitability and solvency.

Third, higher international commodity prices led to substantial hardship in the region. The price hikes were not entirely related to the global financial crisis. For example, a supply condition (i.e. bad weather) has been an important contributor in 2008 and in late 2010. However, economic stimulus programmes that led to resurging demand in several emerging economies, most notably China, has also been a key factor. Faced with higher commodity prices and a limited fiscal space, many governments in the region turned to modifying their energy and food subsidy programmes – exactly when they were needed. These conditions, especially the rapid rise in grain prices in late 2010, fed into the pre-existing mood of civil unrest and ignited the Arab spring events across the region. Concerns over political viability further undermined capital inflows, leading to heavy losses in foreign reserves. The turmoil saw the full-blown closing down of several banking systems, as in Libya and Syria. In other countries, the cumulative impact of rising prices, political instability and lower external demand further led to deleveraging and drops in asset quality.

Turning to a country-by-country analysis, several patterns emerge.

Algeria has been largely unaffected by the global financial crisis. Bolstered by its healthy hydrocarbon exports, the country was able to build a substantial stabilisation fund, which it used as a general fiscal tool. However, the economy is highly dependent on international commodity prices, with Algeria being a leading wheat importer and natural gas exporter, which pose problems in times of increased volatility in

international markets. The impact of the crisis on the country's financial sector has been relatively mild. This has been partly due to the limited size of the banking system, with credit to the private sector representing only 10% to 15% of national income between 2004 and 2011. In addition, most banks are publicly-owned, giving the public sector a direct role in the allocation of credit. Nevertheless, an underdeveloped financial sector should not be seen as a strength as it prevents the economy from reaching its fullest potential and diversifying into non-hydrocarbon sectors (IMF, 2012a).

The global crisis has had an important impact on **Egypt**. In particular, lower tourism receipts, lower exports and spikes in commodity prices adversely impacted the country's external accounts. Fiscal conditions started worsening as the country's generous energy and food subsidies kicked-in during 2009 and onwards. These external drivers have been partly responsible for the onset of violent civil strife that started in early 2011 and culminated with the ousting of Hosni Mubarak. Turning to the financial system, although the Egyptian banking system remained relatively robust during the early phases of the global financial crisis, lower external demand and political instability have led to a substantial reversal of capital inflows. Anaemic domestic growth and reduced capital inflows have also undermined banks' funding and liquidity conditions. Private credit as a percent of national income sharply contracted. Increased default rates due to economic hardship worsened asset qualities (IMF, 2012b).

Israel's economy faced a much milder challenge than many of its neighbours and its peers among advanced countries from the global financial crisis. Moreover, given Israel's weak trade linkages to the MENA region, the Arab spring has had a limited first-degree impact. The banking system has proven particularly robust. The banks have had no direct exposure to troubled assets, including sovereign bonds. They are heavily reliant on domestic deposit-funding and although there is no explicit deposit insurance system, there is a strong backing in the form of implicit guarantees. This makes the system less reliant on funding conditions in international markets. The banking system is also well-capitalised due to a strong supervision culture (IMF, 2012c). A potential weakness, however, is that banks have highly concentrated exposures to large domestic groups, which could be a challenge if global demand for Israel's products slumps.

Like many countries in the region, **Jordan** has experienced rapid growth in the decade leading up to the financial crisis, thanks to political stability and a relatively open economy. Nevertheless, its dependence on commodity imports, capital inflows and tourism receipts has been a source of considerable risk during the crisis. The regional unrest in neighbouring

Syria is another major geopolitical risk impacting economic conditions. The banking system has proved resilient as it is relatively well-capitalised (IMF, 2012d). However, asset quality has been persistently worsening since the beginning of the crisis due to poor performance of the domestic economy.

Lebanon's economy has not suffered much from the early phases of the global crisis, with annual growth remaining around 8% in 2007-10 on the back of a real-estate, tourism and retail trade boom. The positive conditions did not last, however, and worsened through 2011, most notably by a slowing domestic demand and increasing regional conflict risks. The banking sector has been relatively robust due to various reasons, including a dramatic improvement in non-performing loans, dropping to 4.0% of total loans in 2011, down from 17.7% in 2004 (IMF, 2012e). Nevertheless, the banks are heavily exposed to currency risks due to sizeable foreign-currency lending and deposits.

Thanks to structural and macroeconomic reforms, **Morocco's** economy has gone through the global crisis relatively unscathed. However, since the country's trading partners are predominantly European and due to a heavy reliance on commodities imports, the country is heavily exposed to external developments. Morocco signed a 24-month precautionary loan agreement with the IMF in the summer of 2012 to secure optional liquidity lines in case of heavy swings in external balances (IMF, 2012f). Amidst a relatively healthy economy and credible policy responses, the banking sector has grown considerably, despite the global crisis. Private credits by banks represented 71.2% of national income in 2011, up from only 42.6% in 2004. Most of the bank funding is through local currency deposits, which contributes to the stability of the system (IMF, 2011). Moreover, the Moroccan authorities have successfully induced banks to improve asset quality, which resulted in a drop in the ratio of non-performing loans to total loans from nearly 20% in 2004 to 5% in 2011.

Much like Libya, **Syria** has faced exceptional circumstances due to growing political conflict and eventually a full-blown civil war. The domestic conflict took off in early 2011, with nationwide demonstrations demanding the resignation of President Bashar al-Assad, gradually turning into a bloody civil conflict. Prior to the civil war, the global financial crisis had a relatively modest impact on Syrian economy, mostly operating through reduced exports to Europe and the Gulf countries (IMF, 2010). The global crisis did trigger civil discontent, as the authorities moved to reduce energy subsidies in 2009. With international sanctions in place and the ongoing violence, it is unlikely that the economic conditions will improve in the near future. Within the financial services sector, several pre-existing

conditions have limited the impact of the crisis. Credit to the private sector represented only 22.9% of national income in 2010. Like other underdeveloped systems, its banks were flush with liquidity, keeping substantial amounts of excess reserves. Despite privatisation efforts, nearly 70% of all available credit was supplied by public banks in 2010, which distributed credit based on politically-oriented criteria.

Much like other Maghreb countries, **Tunisia** has not been heavily impacted by the initial effects of the crisis. Nevertheless, its exposure to the EU through its exports, tourism and remittances has dealt a relatively heavy secondary shock to economic activity as early as 2009. Faced with lower external demand, the Tunisian government implemented a stimulus programme. The economic conditions once again worsened in late 2010, leading up to the overthrow of President Ben Ali. The political instability following the revolution and worsening economic conditions in the EU further challenged the economy. The widening current-account deficit (due to lower external demand) and lower capital inflows (due to political uncertainty) have put Tunisia's fixed-rate currency policy in question, leading to a build-up of inflationary pressures and the erosion of official currency reserves. While Tunisia's well-developed banking sector has remained relatively robust in 2009, it was put under severe stress in 2011. In particular, the improving tendency in the banking sector has slowed down considerably. Recent international assessments suggest that the conditions could be worse than what is reported due to inherent deficiencies in reporting (IMF, 2012g).

Turkey has experienced both extremes of the global financial crisis, thanks primarily to its exposure to the EU, its open economy and its policy responses. It was one of the hardest-hit emerging economies by the global financial crisis in late 2008 and early 2009. The economy buoyed very quickly in subsequent years due to external and domestic developments. The low interest-rate regimes put into place in advanced countries increased portfolio inflows to many emerging economies, including Turkey. The domestic authorities responded by rate cuts as well as a short-lived fiscal expansion in 2009. These developments, along with the new mortgage law that was enacted in 2007, fed the country's credit growth, with private credit bulging to 50% of national income at the end of 2011, up from only 17.3% in 2004. The growth of credit increased domestic demand for imports, which led to a worsening current-account deficit and rising inflationary expectations in 2011. Although banks are well-capitalised and asset quality remains healthy, the balance-sheet growth relied heavily on short-term foreign funding and not domestic savings, which can generate a sort of liquidity shortage should inflows suddenly stop. To prevent the

unsustainable build-up of credit and ensure that capital inflows are oriented towards the long-term, the authorities have implemented – at times unorthodox – policies in 2011 and onwards. The policies have only been partly successful and led to a planned cooling of the economy in 2012, although there are indications that external risks remain (IMF, 2012h).

3.3 Methodology and data

The assessment of whether the financial crisis has had an impact on the banking systems is made by pre- and post-crisis comparisons of the following areas of interest and variables:

- **Liquidity**
  - Loans-to-deposits (LTD = customer loans/customer deposits)
- **Performance**
  - Net interest income margin (NIM = net interest income/total earning assets)
  - Return-on-equity (RoE = post-tax profits/total equity)
  - Return-on-assets (RoA = post-tax profits/total assets)
- **Efficiency**
  - Cost-to-income ratio (CIR = non-interest expenditures/operating income)
- **Fragility**
  - Non-performing loan ratio (NPL = impaired loans/total loans)
  - Capital ratio (CAR = total equity/total assets)
  - Z-score (Z= – [CAR + avg(RoA)]/stdev(RoA)).[4]

Due to data limitations on the maturity mismatches and the distribution of assets within the balance sheets, the evolution of liquidity conditions are assessed through the loan-to-deposit (LTD) ratio. In theory, in less-developed banking systems, most banks concentrate on retail activities. To that extent, a bank either has a choice between issuing local retail loans and buying government debt, which is more liquid than customer loans. On the other hand, if a bank has less customer deposits than customer loans (i.e. a retail funding gap), it will need to finance its retail activities through back-to-back market funding. Since market funding may dry out, as was clearly shown during the crisis, banks with a retail

[4] The calculation of the Z-score closely follows Boyd & Runkle (1993).

funding gap are more likely to run into liquidity problems. In either case, a low LTD ratio is indicative of a highly liquid position for the banks.

Turning to the three performance indicators, the NIM determines how profitable a bank's retail operations are. A lower value implies that the bank is paying too much for funding itself through deposits vis-à-vis the interest it charges on its loans. RoE (return on equity) is arguably the most popular indicator (for better or for worse) for assessing profitability. A greater value may imply that a bank is doing better in terms of net income generation. But it can also imply that it has less capital than its peers, which means that it should be interpreted with care. RoA (return on assets) performs the same function, but only with total assets as the denominator, thus not being subject to potential errors that RoE may have.

For each one of the variables above, the importance of the impact of the crisis on the relevant variable is assessed by three complementary tests. First, the Wilcoxon signed-rank test is used to determine whether the pre- and post-crisis figures are from populations with the same distributions. Second, a k-sample test for equality of medians is used to complement the discussion to determine whether the samples are drawn from populations with the same central element, not focusing on other distributional attributes. Third, a simple first-order autoregressive regression AR(1) model with crisis dummies were run to account for trend growth. More specifically, the model is defined as:

$$Y_{i,t} = \alpha + \beta \cdot Y_{i,t-1} + \varphi \cdot CRISIS_t + \varepsilon_{i,t} \quad (1)$$

Where Y is the indicator being tested and CRISIS is the crisis dummy. Furthermore, the tests were also repeated for two alternative crisis period specifications, 2008-11 and 2009-11, leading to a total of six separate tests.[5]

The data were extracted from BvD's Bankscope database encompassing the years 2003 to 2011 and nine of the 10 SEMCs covered in this study, namely Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia and Turkey. Libya was eliminated due to inadequate number of observations (i.e. only two banks per year since 2007).

[5] An additional test was also conducted to ensure that the changing conditions were not due to an autoregressive trend evolution. It is important to highlight that since the time-series data are relatively short, this particular assessment will only be used to complement the discussion.

Table 3.2 Descriptive statistics of the BvD's Bankscope database

	Obs.	Mean	St. dev.	Min.	Max.
Loans-to-deposits (LTD)	982	93.77	482.83	5.65	9,166.00
Non-performing loans (NPL)	624	6.67	7.63	0.00	58.67
Net interest margin (NIM)	990	3.41	1.76	0.18	13.71
Return-on-equity (RoE)	992	10.57	9.34	-94.87	34.17
Return-on-assets (RoA)	992	1.07	0.94	-3.90	5.39
Cost-to-income (CIR)	975	57.16	25.08	-324.48	355.57
Capital ratio (CAR)	996	10.89	7.00	2.62	61.93
Z-score (Z)	957	46.22	51.91	0.28	714.58

Table 3.3 Key characteristics of sample coverage, 2003-11

	2003	2004	2005	2006	2007	2008	2009	2010	2011
					Number of banks				
Algeria	7	10	9	9	14	10	12	13	11
Egypt	20	16	13	13	17	14	17	21	18
Israel	6	6	7	7	9	7	6	7	7
Jordan	4	4	5	9	8	7	9	8	7
Lebanon	28	22	24	24	25	27	28	27	22
Morocco	6	7	7	8	7	8	9	9	8
Syria		3	3	7	8	6	9	10	4
Tunisia	11	10	10	11	11	11	12	11	10
Turkey	16	18	21	22	23	23	20	21	22
					Total assets (€ billions)				
Algeria	12.2	23.3	19.0	15.3	42.5	49.0	49.3	56.3	69.3
Egypt	44.0	33.1	47.6	49.7	50.2	69.8	91.6	125.5	107.0
Israel	135.5	100.1	167.5	120.4	182.4	133.4	161.4	236.0	248.2
Jordan	4.4	4.1	27.6	30.9	31.5	35.1	38.4	41.0	44.8
Lebanon	43.2	44.2	58.5	60.0	64.3	77.5	89.8	98.2	112.1
Morocco	22.6	38.2	44.9	60.4	62.8	82.7	108.8	116.4	108.7
Syria	0.0	11.9	1.3	14.7	15.5	18.4	19.4	22.1	3.3
Tunisia	15.2	14.6	16.1	15.6	16.9	18.8	23.1	23.9	26.9
Turkey	106.6	127.0	249.0	262.5	337.9	344.1	322.0	476.1	478.8

3.4 Results

3.4.1 Liquidity

Anecdotal evidence and the prior literature amply show that the banks in certain SEMCs are flush with liquidity, (Ayadi et al. 2011; 2013 and references therein). Table 3.4 first shows the evolution of the LTD ratio (at the aggregate country-level). It then depicts the results of (W)ilcoxon signed-rank and (K)-sample equality of means tests, once under the assumption that the crisis started in 2008 and a second time under the assumption that it started in 2009. The figures confirm that the banks in Algeria, Egypt, Jordan, Lebanon and Syria collect more retail deposits than the retail loans issued, implying a potential abundance of liquid assets. It is important to highlight that while there is not much information on the liquidity of the rest of the assets, it is assumed that the rest of the assets mainly comprise relatively liquid government exposures, either in the form of bonds held or loans issued.

While Algeria's initial 2003 figure is heavily influenced by a single bank, customer loans represent only half of the customer deposits for the rest of the period, with no perceivable change over the entire period tested. The conditions also have not changed much in Israel, although the banking system appears to be better at diverting savings into loans for the general public. The LTD ratio has clearly improved in Jordan although not enough for the sampling tests to highlight a statistically significant change. The ratios for the Lebanese, Moroccan, Syrian and Turkish systems have also improved and significantly so. Interestingly, Tunisia is the only country in the sample whose banks regularly run retail funding gaps, i.e. less deposits than loans, requiring alternative forms of funding to fill the gap.

Table 3.4 Customer loan-to-deposits (LTD) ratio, 2003-11 (% of customer deposits)

										Significance of impact under crisis specification					
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2008-11**			**2009-11**		
										W	**K**	**D**	**W**	**K**	**D**
Algeria	102.2	57.6	35.8	64.2	35.9	39.6	54.0	52.1	51.6						
Egypt	56.9	51.9	48.9	48.0	42.3	43.3	40.7	40.3	40.9						
Israel	82.6	80.7	82.0	80.6	84.2	82.9	87.4	91.1	88.5						
Jordan	48.7	45.7	54.1	63.4	68.0	69.0	65.0	62.3	61.5						
Lebanon	24.1	24.1	23.9	26.4	28.7	32.1	30.3	39.1	33.8	+++	+++		++	++	

Morocco	64.4	58.2	60.4	66.5	71.9	82.5	86.9	91.7	100.6	+++	+++	+++	+++	+++	
Syria		32.9	25.1	45.7	57.0	78.0	69.8	68.9	63.0	+++	+++	+	+++	+++	
Tunisia	110.3	103.9	101.1	99.2	94.7	97.6	91.3	97.9	105.7						
Turkey	55.9	53.6	63.2	73.0	81.7	84.1	87.7	86.9	100.6	+++	+++	---	+++	+++	--

Notes: The country-specific figures are calculated by aggregating the elements for the ratio, i.e. treating the entire system as a single bank, to ensure that the impact of larger banks is appropriately reflected. The significance tests for the impact of the crisis identify whether the changes have significantly improved or worsened at the 1% (identified with "+++" or "---"), 5% ("++" or "--") or 10% ("+" or "-") levels. "W" stands for Wilcoxon signed-rank test, "K" stands for k-sample test for equality of medians and "D" stands for the significance of the crisis dummy in the AR(1) model.

Apart from a direct impact of the crisis, the improving LTD ratios may also reflect the trends in the relevant banking systems. A full-blown analysis is made difficult due to the unavailability of a long time-series. However, the AR(1) regressions produce relatively significant coefficients for the crisis dummies for Morocco and Syria for the 2008-11 crisis specification. For Turkey, the time-series analysis shows that the trend improvement in the ratio may have slowed down due to the crisis. These results imply that for Lebanon, the depicted changes are more likely to be due to trend improvements rather than an impact of the crisis.

3.4.2 Performance

The evolution of the performances of the banks was assessed through three related variables. Table 3.5 depicts the evolution of the net interest margin (NIM). A simple glance over the figures shows that the profitability of retail operations has improved in Egypt, especially following 2008. The results from AR(1) regressions show that the improvements are due to the crisis, at least according to the 2008-11 crisis specification. This paradoxical result could be due to increased risk premia charged by banks in an increasingly uncertain environment (more on this below). In turn, the changes in the NIM for Lebanon, Morocco and Syria appear to be related to trend-growth rather than the crisis. Lastly, the AR(1) results hint at a significant negative impact of the crisis in Algeria and Jordan once trend growth is accounted for.

Table 3.5 Net interest margin in selected SEMCs, 2003-11 (% of total earning assets)

										Significance of impact under crisis specification	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2008-11**	**2009-11**

										W	K	D	W	K	D
Algeria	3.5	2.8	3.8	4.6	2.8	2.7	2.4	2.2	2.1			-			-
Egypt	1.3	1.6	1.8	1.6	1.7	1.8	2.2	2.3	2.6	+++	+++	+++	+++	+++	
Israel	2.6	2.7	2.6	2.6	2.3	2.5	2.2	2.5	2.3						
Jordan	3.3	3.4	3.0	3.2	3.3	3.5	3.5	3.3	3.2						--
Lebanon	2.8	2.4	2.5	2.7	2.2	2.6	2.2	2.3	2.3	--	--		---	---	
Morocco	4.0	4.2	4.1	3.4	3.4	3.3	3.3	3.4	3.2	--					
Syria		0.0	1.7	3.4	4.0	3.7	2.9	2.4	3.7	++					
Tunisia	2.7	2.3	2.4	2.6	2.9	3.0	2.8	2.7	2.6						
Turkey	5.6	6.6	4.6	4.6	4.9	4.6	5.7	4.4	3.8						

Notes: The country-specific figures are calculated by aggregating the elements for the ratio, i.e. treating the entire system as a single bank, to ensure that the impact of larger banks is appropriately reflected. The significance tests for the impact of the crisis identify whether the changes have significantly improved or worsened at the 1% (identified with "+++" or "---"), 5% ("++" or "--") or 10% ("+" or "-") levels. "W" stands for Wilcoxon signed-rank test, "K" stands for k-sample test for equality of medians and "D" stands for the significance of the crisis dummy in the AR(1) model.

Table 3.6 gives the country-level RoE figures. The figures improve for Algeria (only for 2008-11 crisis specification), Lebanon, Syria and Tunisia. Deeper analysis, however, shows the trend improvements and not the crisis had a role in these developments. Moreover, in the case of Syria, the AR(1) results under the 2009-11 specification hint that the crisis actually slowed down these improvements. In turn, profitability worsened under the 2008-11 crisis specification in Israel and (less strongly) in Turkey, while the drop in profitability in Jordan was a trend process and not due to the crisis. Egypt has also faced a slight drop in profitability under the 2008-11 crisis specification after controlling for trend growth.

Table 3.6 Return-on-equity in selected SEMCs, 2003-11 (% of total equity)

										Significance of impact under crisis specification					
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2008-11			2009-11		
										W	K	D	W	K	D
Algeria	3.7	5.0	7.6	16.0	14.7	16.4	16.1	14.1	16.2		++				
Egypt	7.0	10.4	10.8	8.2	14.1	8.7	13.4	14.3	12.4			-			
Israel	7.7	10.8	13.3	14.3	14.9	3.0	7.9	9.5	10.0	---	--	---			
Jordan	11.7	10.7	12.7	9.8	10.2	10.6	7.3	5.9	8.1	---	---		---	--	
Lebanon	11.7	10.1	11.5	10.8	11.8	13.7	12.9	14.8	14.2	++	+++		++	+++	
Morocco	7.5	8.5	13.2	13.9	14.5	14.3	13.2	12.3	12.5			---			

Syria		-0.3	2.1	-5.0	13.0	19.9	12.0	10.8	8.1	++	++				--
Tunisia	6.3	4.0	5.9	6.2	7.4	9.2	8.8	8.2	4.6	++	++				
Turkey	16.5	16.9	18.3	19.6	21.8	17.2	18.3	18.4	15.1	--		-			

Notes: The country-specific figures are calculated by aggregating the elements for the ratio, i.e. treating the entire system as a single bank, to ensure that the impact of larger banks is appropriately reflected. The significance tests for the impact of the crisis identify whether the changes have significantly improved or worsened at the 1% (identified with "+++" or "---"), 5% ("++" or "--") or 10% ("+" or "-") levels. "W" stands for Wilcoxon signed-rank test, "K" stands for k-sample test for equality of medians and "D" stands for the significance of the crisis dummy in the AR(1) model.

The results for RoA depicted in Table 3.7 tell a similar story. Indeed, profitability increases for Algeria, Lebanon, Syria and Tunisia. With the exception of Lebanon under the 2008-11 crisis specification, these appear to be entirely due to trend improvements. The strong performance of Lebanese banks despite the crisis will be a recurring theme below. The Israeli and Turkish banks appear to have lower profitability under the 2008-11 crisis specification once the trend process was accounted for. The findings also highlight weakly worsening conditions not only in Egypt (as above) but also in Jordan and Morocco once the AR(1) term is included.

Table 3.7 Return-on-assets in selected SEMCs, 2003-11 (% of total assets)

										Significance of impact under crisis specification					
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2008-11**			**2009-11**		
										W	**K**	**D**	**W**	**K**	**D**
Algeria	0.2	0.2	0.4	1.1	0.8	1.0	1.6	1.4	1.6	+++	+++		+++	+++	
Egypt	0.4	0.6	0.7	0.5	0.9	0.5	0.9	0.9	0.9			-			-
Israel	0.4	0.6	0.7	0.8	0.9	0.2	0.5	0.6	0.6			---			
Jordan	1.3	1.3	1.4	1.6	1.6	1.6	1.1	0.9	1.2	---	--		---	---	-
Lebanon	0.7	0.6	0.8	0.9	0.9	1.1	1.1	1.2	1.1	+++	+++	+	+++	+++	
Morocco	0.7	0.7	1.2	1.2	1.2	1.1	1.1	1.2	1.1			-			
Syria		0.0	0.2	-0.6	2.2	2.2	1.3	1.2	0.9	++					

Tunisia	0.7	0.4	0.6	0.7	0.8	1.2	1.1	1.1	0.5	+++	+++			++	
Turkey	2.5	2.1	2.1	2.1	2.5	1.8	2.3	2.2	1.6	--		-			

Notes: The country-specific figures are calculated by aggregating the elements for the ratio, i.e. treating the entire system as a single bank, to ensure that the impact of larger banks is appropriately reflected. The significance tests for the impact of the crisis identify whether the changes have significantly improved or worsened at the 1% (identified with "+++" or "---"), 5% ("++" or "--") or 10% ("+" or "-") levels. "W" stands for Wilcoxon signed-rank test, "K" stands for k-sample test for equality of medians and "D" stands for the significance of the crisis dummy in the AR(1) model.

3.4.3 Efficiency

The country-level aggregate CIR figures and the corresponding statistical tests are depicted in Table 3.8. While the figures show substantial degree of variability, mainly due to heavy losses suffered in some countries (i.e. Syria in 2007), several common observations emerge. Israel has clearly faced increasing costs under the crisis specification 2008-11. This is the case even after controlling for trend growth. Actually, the coefficient estimate for the crisis dummy in the AR(1) regression for Israel was 4% (not shown here), which points to a remarkable deterioration.

The CIR figures have dropped for several countries, including Lebanon, Morocco and Tunisia, which point to lower costs and increased efficiency. However, these improvements turn out to be related to trend developments, with the exception of Lebanon where efficiency gains actually became speedier during the crisis. This unexpected result attests to the strength of the Lebanese banking system during the crisis.

Table 3.8 Cost-to-income ratio (CIR), 2003-11 (% of operating income)

										Significance of impact under crisis specification					
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2008-11**			**2009-11**		
										W	**K**	**D**	**W**	**K**	**D**
Algeria	41.7	49.6	23.9	62.8	48.2	28.4	36.7	32.5	37.6						
Egypt	51.2	48.9	52.3	55.1	48.4	39.9	46.0	37.9	51.8						
Israel	61.2	57.6	65.8	66.3	64.9	76.5	64.5	68.4	70.4	+++	++	+			
Jordan	52.5	35.7	57.1	45.2	44.0	46.7	46.3	45.0	47.9						
Lebanon	54.1	54.7	61.0	53.5	54.8	52.5	50.4	47.9	48.6		--	--	--	---	-
Morocco	53.8	51.1	52.7	51.9	49.5	54.8	49.3	48.5	50.5		--			--	
Syria		144.0		1,444.5	-19.3	22.1	25.3	27.6	42.2						
Tunisia	62.9	55.9	71.3	57.6	53.9	47.9	52.1	49.3	53.6	--	--				

Turkey	72.0	43.3	54.4	50.6	48.1	50.6	43.1	47.8	52.8		

Notes: The country-specific figures are calculated by aggregating the elements for the ratio, i.e. treating the entire system as a single bank, to ensure that the impact of larger banks is appropriately reflected. The significance tests for the impact of the crisis identify whether the changes have significantly improved or worsened at the 1% (identified with "+++" or "---"), 5% ("++" or "--") or 10% ("+" or "-") levels. "W" stands for Wilcoxon signed-rank test, "K" stands for k-sample test for equality of medians and "D" stands for the significance of the crisis dummy in the AR(1) model.

3.4.4 Fragility and risk

Fragility and risks in the banking system are assessed through three distinct indicators. The evolution of the capital ratios of banks will be considered first in Table 3.9. It is clear from the figures that capital ratios have improved during the crisis in almost all of the sampled countries, except Turkey although this appears to be due to the trend.[6] In particular, CAR increased in Algeria, Egypt, Israel, Jordan, Lebanon, Morocco and Syria. Once trend developments are controlled by the AR(1) model, the crisis had a positive impact on CAR only in Egypt, Morocco and Syria.

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Table 3.9 Capital ratio (CAR), 2003-11 (% of total assets)

										Significance of impact under crisis specification					
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2008-11**			**2009-11**		
										W	**K**	**D**	**W**	**K**	**D**
Algeria	6.6	4.5	5.5	6.8	5.5	6.3	9.7	10.2	9.7	++	+++		+++	+++	+
Egypt	5.7	6.2	6.2	5.8	6.6	5.8	6.8	6.6	6.9	+++	+++	+	+++	+++	
Israel	5.4	5.5	5.6	5.9	6.2	6.1	6.6	6.5	6.0	++			++		
Jordan	10.7	11.9	11.4	16.4	15.9	15.0	15.3	15.4	15.1		++			++	
Lebanon	6.0	6.1	7.0	8.2	7.8	7.8	8.1	7.9	7.4	+++	+++		+++	+++	
Morocco	9.2	8.8	8.9	8.7	8.5	7.8	8.5	9.5	8.7			+++			++
Syria		4.2	7.9	12.2	16.7	11.1	10.7	11.6	11.7			++			++
Tunisia	10.5	10.7	10.5	11.4	11.1	13.2	12.5	12.9	11.7						
Turkey	15.1	12.7	11.4	10.5	11.4	10.3	12.4	12.0	10.9					--	

Notes: The country-specific figures are calculated by aggregating the elements for the ratio, i.e. treating the entire system as a single bank, to ensure that the impact of larger banks is

[6] This result is possibly due to the increasing leveraging of the Turkish banking system through increasing reliance on foreign short-term debt, the principle force behind the spectacular loan growth.

appropriately reflected. The significance tests for the impact of the crisis identify whether the changes have significantly improved or worsened at the 1% (identified with "+++" or "---"), 5% ("++" or "--") or 10% ("+" or "-") levels. "W" stands for Wilcoxon signed-rank test, "K" stands for k-sample test for equality of medians and "D" stands for the significance of the crisis dummy in the AR(1) model.

The second fragility and risk indicator, summarised in Table 3.10, considers the share of impaired loans on banks' loan portfolios. Although the data on impaired loans are highly incomplete (and incomparable due to distinct impairment standards), the figures show clearly worsening conditions for several countries. In particular, NPL ratios have increased in Jordan, Morocco, Syria and Turkey, in all cases even after accounting for trend growth. In the case of Morocco, the results are less reliable due to limited data; however, the NPL rates in Jordan have nearly doubled during the crisis.

The last indicator considered in the section is a distance-to-default estimate, or the Z-score. More specifically, the figures show the size of a shock, in multiples of standard deviation for RoA for a bank, which can bring that bank to default. If the crisis has made banks weaker, the so-called Z-score should drop, implying that the bank is closer to a default. Surprisingly, Overall, using indicators or liquidity, performance, efficiency, risk and fragility, the impacts of the crisis have been mild on the banking systems in the SEMCs, with some variation between countries under investigation.

Table 3.11 points at several improvements. In particular, banks have become less fragile in Algeria, Jordan and Syria. The results of the AR(1) model show that these improvements were due to the crisis in Algeria and Syria but not in Jordan. More expectedly, banks became more fragile in Israel and Tunisia, although in the later case the worsening conditions are part of the trend. Although the sample statistics point at increased fragility of Egyptian banks, the AR(1) model shows that the crisis has only slowed down the trend worsening, which has clearly hit the country's banks as early as 2007.

Table 3.10 Non-performing loans (NPL), 2003-11 (% of total loans)

										Significance of impact under crisis specification					
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2008-11**			**2009-11**		
										W	**K**	**D**	**W**	**K**	**D**
Algeria		0.5	2.8	3.2	2.3	1.7	1.8	3.4	2.7						

Egypt		8.1	10.1	11.7	1.7	2.5	7.0	11.2	8.3							
Israel	8.7	7.4	7.9	5.3	4.6	4.9	5.4	3.7	2.9	---	---		---	---		
Jordan	6.0	5.3	6.0	6.4	4.9	5.0	9.4	11.7	8.4	++		+++	+++		+++	
Lebanon	12.8	12.0	9.4	9.1	7.2	11.8	9.9	7.1	5.5	--	--		--	--	-	
Morocco				4.9	3.8	3.8	4.1	4.4	5.3			+++			+++	
Syria				0.3	0.3	0.5	1.4	2.9	6.8	+++	++	++	+++	+++	+	
Tunisia		22.1	29.3	20.2	18.9	14.1	12.5	10.2	11.1	---	--		--	--		
Turkey	5.3	2.8	3.5	2.8	2.6	3.2	5.5	3.9	3.0	+++	+++	+++	+++	+++	++	

Notes: The country-specific figures are calculated by aggregating the elements for the ratio, i.e. treating the entire system as a single bank, to ensure that the impact of larger banks is appropriately reflected. The significance tests for the impact of the crisis identify whether the changes have significantly improved or worsened at the 1% (identified with "+++" or "---"), 5% ("++" or "--") or 10% ("+" or "-") levels. "W" stands for Wilcoxon signed-rank test, "K" stands for k-sample test for equality of medians and "D" stands for the significance of the crisis dummy in the AR(1) model.

Overall, using indicators or liquidity, performance, efficiency, risk and fragility, the impacts of the crisis have been mild on the banking systems in the SEMCs, with some variation between countries under investigation.

Table 3.11 Z-score, 2003-11 (standard deviations of RoA)

										Significance of impact under crisis specification					
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2008-11**			**2009-11**		
										W	**K**	**D**	**W**	**K**	**D**
Algeria	19.3	20.8	22.1	20.6	29.8	30.6	42.3	39.9	38.5	+++	+++	+	+++	+++	
Egypt	47.4	39.1	65.0	53.7	29.8	24.3	33.1	30.7	33.3	---	---		---	---	+++
Israel	22.0	26.9	25.8	30.3	31.6	29.9	27.7	29.6	30.8			-			
Jordan	35.3	39.7	36.2	39.9	35.3	46.5	48.4	47.5	49.2	++	+++			+++	
Lebanon	57.2	65.6	69.7	55.0	67.3	60.0	61.1	56.6	58.5						
Morocco	62.2	57.4	62.4	164.4	70.2	72.4	71.2	78.2	68.1						
Syria		24.6	10.9	16.1	17.1	36.2	39.8	39.6	58.4	+++	+++	+++	+++	+++	++
Tunisia	110.2	56.3	59.0	108.8	58.8	69.9	43.6	47.5	47.4					--	
Turkey	29.9	31.6	29.4	31.0	33.9	31.3	34.2	32.6	28.5						

Notes: The country-specific figures are calculated by plain averages. The significance tests for the impact of the crisis identify whether the changes have significantly improved or worsened at the 1% (identified with "+++" or "---"), 5% ("++" or "--") or 10% ("+" or "-") levels. "W" stands for Wilcoxon signed-rank test, "K" stands for k-sample test for equality of medians and "D" stands for the significance of the crisis dummy in the AR(1) model.

3.5 The impact of crisis on capital markets

The challenges in assessing the extent of cross-border contagion are related to identifying an estimation corresponding to the different modes of transmission while at the same time accounting for inherent statistical problems. The first challenge derives from the definition of the main concept. Contagion is often defined as a significant and persistent increase in cross-border linkages after a shock event. The concept should not be confused with interdependence, but should rather be seen as an uptick in stock market co-movements during the crisis. Since many (possibly non-stationary) factors may explain the underlying processes, the challenge is using a methodology that clearly pinpoints the changing nature of linkages during the crisis periods. Second, and more technically, the unadjusted measures of stock co-variances suffer heavily from heteroscedasticity since volatility naturally increases during crisis periods. As first noted by Forbes & Rigobon (2002), this synthetic increase in correlations could lead to upward-biased assessments of contagion and should be appropriately controlled for.

The procedures used in this study respond to these challenges by using two alternative estimation techniques. First, a measure of the change in the responsiveness of stock market indices to global events is developed following the structural time series model of Moosa (2010). In essence, the structural time series models control for various forms of factors that may explain the evolution of stock market indices. Second, the dynamic correlation analyses based on Chiang et al. (2007) and more recently Hwang et al. (2011) are used to assess the extent to which stock market returns are correlated. Since returns display increasing volatility during negative shock periods, a generalised autoregressive conditional heteroscedastic (GARCH) model was used to control for volatility in error terms. Moreover, in order to assess whether the correlations have changed persistently following the default of Lehman Brothers and the Arab spring, the dynamic conditional correlations (DCC-GARCH) were calculated using Engle's (2002) procedures.

3.6 Stock market conditions from 2007 to 2012

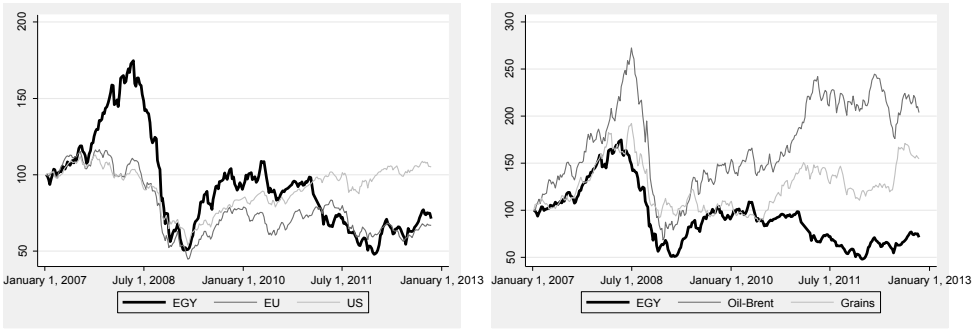
Figure 3.2 gives an overview of the evolution of the stock market indices in eight SEMCs, adjusted for US dollar terms. As is clear from the figures, the impact of the financial crisis varies from country to country. In particular, as of November 2012, the Israeli, Tunisian and Turkish stock exchanges have outperformed the US Dow-Jones index during the global crisis. At the

same time, the Egyptian, Jordanian, Palestinian and Syrian indices remained below their January 2007 levels.

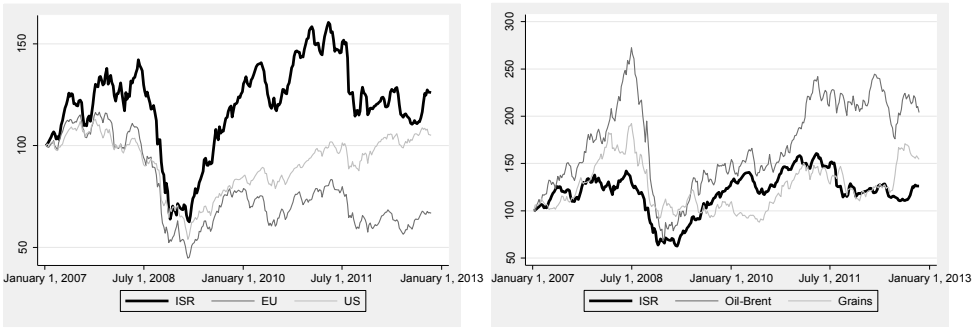
The figures also highlight a positive linkage between commodity prices and stock markets in 2007-08. This is surprising since the countries in the sample are mostly commodity importers, which should suffer from the adverse wealth effects of high energy prices. The relationship is most likely a latent effect of growing production in emerging markets, including most notably Brazil, Russia, India and China (BRICs), and the consequent rise in global demand for oil (Hamilton, 2009). To put it simply, the rising oil prices probably serve as a proxy for growing output and consequently growing investment opportunities in emerging and frontier economies. For the years 2007-08, the rise in oil prices appear to have led to a substantial rise in stock market indices in many of the countries covered in the study. For those years, one can say that the close links with commodity prices is evidence that emerging markets have de-coupled themselves from the EU and the US capital markets, which fared worse. The more recent (and the more persistent) spike in commodity prices of 2011-12, however, has not been equally beneficial for the SEMCs, which is most likely due to the Arab spring and the worsening of the eurozone crisis.

Turning to a detailed analysis of each country, in Egypt the evolution of the EGX-30 index has been closely related to the price of commodities, at least prior to the onset of the Arab spring events. The rapid rise in the index has also overlapped with the merger of the Cairo and Alexandria stock exchanges (CASE) into the Egyptian Exchange in 2008. In May 2008, the decision of the government to increase domestic fuel prices, amidst the continuing rise in international prices, has led to a substantial drop of 70% in the local currency value of the index, from its peak on 5 May 2008 to its trough on 5 February 2009. The worsening global conjecture, especially in the aftermath of the default of Lehman Brothers in September 2008, has probably also contributed to this severe loss in value. The index has fallen around 25% during the first three months of 2011 in the midst of the Arab spring and the ousting of President Mubarak, resulting in the closing of the country's stock exchange for around eight weeks. The losses continued after the exchange resumed its operations in March 2011, with the EGX-30 reaching an historical low by the end of 2011. Since then, the exchange has been on an upward trajectory.

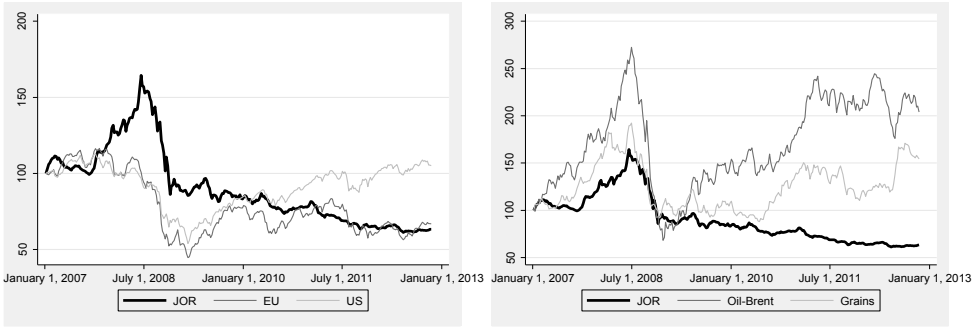
Figure 3.2 Stock market indices in SEMCs, January 2007-November 2012



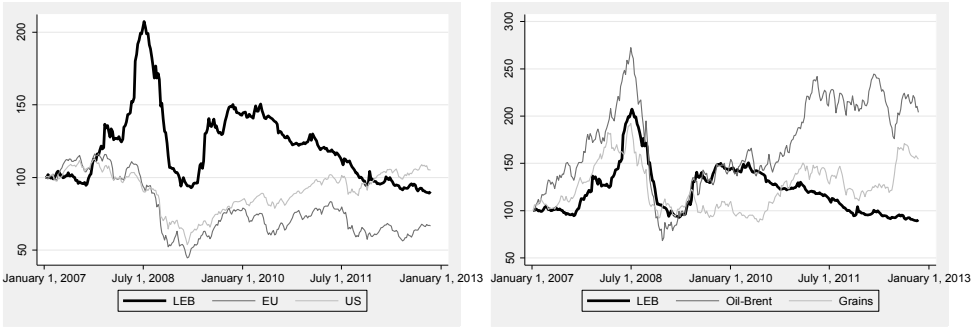
(a) Egypt (EGX-30)



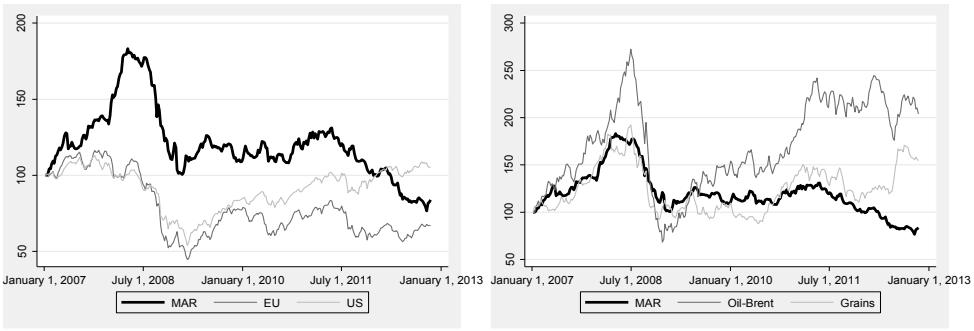
(b) Israel (TA-100)



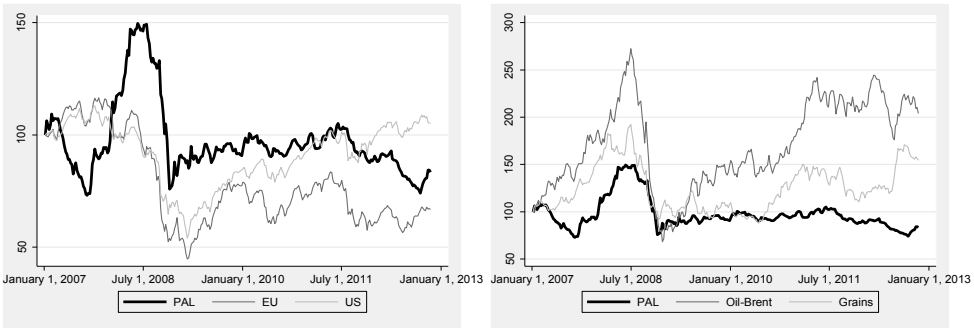
(c) Jordan (ASE Free float index)



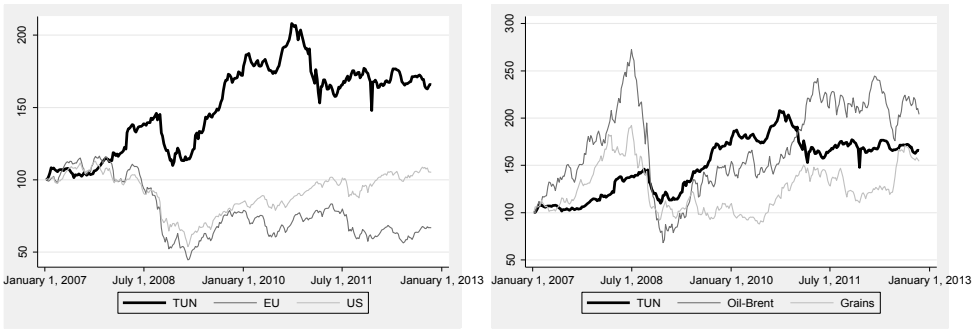
(d) Lebanon (MSCI, Large & Mid cap)



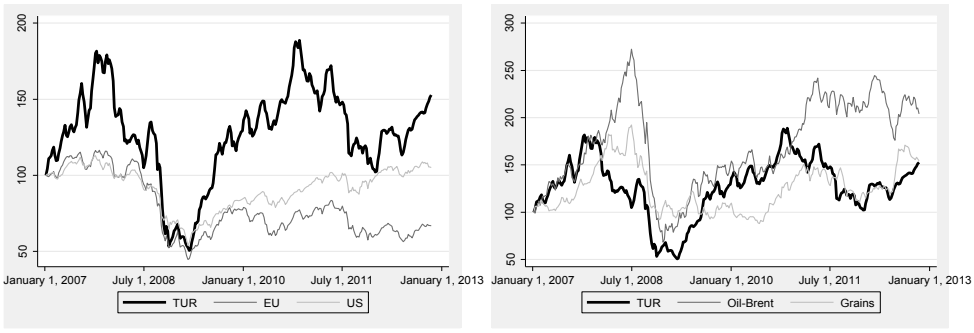
(e) Morocco (MSCI, Large & Mid cap)



(f) Palestine (Al-Quds)



(g) Tunisia (TUNINDEX)



(h) Turkey (ISE-100)

Notes: All figures are normalised so that beginning January 2007 is set to 100. All figures are adjusted using weekly US dollar averages. For the US and the EU, the Dow Jones Composite Index (DJCI) and Euronext-100 have been used. In Morocco and Lebanon, the MSCI index was preferred to national sources due to the limited availability of data for earlier years.

Sources: National stock exchange websites; MSCI.

The evolution of **Israel's** stock market more closely follows the international markets, with the exception of a phase of over-performance between early 2009 and early 2011, despite worsening global financial conditions and the Gaza Flotilla raid in May 2010. The sharp drop in the index in August 2011 overlapped with the Standard and Poor's downgrading of the US sovereign debt and growing troubles in the eurozone periphery. Since then, the market evolution has closely followed the international markets and has failed to benefit from the re-emergence of investment flows to emerging and potentially high-growth countries, such as Israel.

Jordan's stock market has followed the evolution of oil prices prior to 2009. Much like in Egypt, this most likely reflects growing interest in Jordan as a frontier high-growth economy. Indeed, the foreign interest has

led to a rapid growth in Jordan's financial services and real estate sectors prior to October 2008. Persistent losses thereon are most likely due to the impact of the financial crisis as well as growing tensions within the region.

In the case of **Lebanon**, the stock market index closely follows the commodities markets prior to 2011. Once again, this is most likely due to growing interest among international investors in alternative emerging regions. It is important to note that the Lebanese market is one of the largest in the region, with a market capitalisation of nearly 30% of GDP in 2011. Although the market has outperformed the EU and US indices for most of the crisis, the growing regional tensions have led to persistent losses (much like in Jordan) since early 2010.

Morocco's stock market has followed a similar pattern of Jordan and Lebanon, inching up with increasing commodity prices, which highlight growing demand for oil from emerging economies, possibly on the back of an increased interest in emerging economies among investors. Much like the two countries, the index has remained relatively stable (in USD terms) and consistently outperformed the EU and US averages up until late 2011. The losses starting in the first half of 2011 are likely to be at least partly due to the Arab spring, although alternative issues, such as the slowdown in global demand, can also be at play.

The **Palestinian** stock exchange also appears to have benefited from increased interest from international investors in early 2008. The re-balancing act came swiftly, as in other stock exchanges in the region, with the fall of Lehman Brothers in September 2008 and in the months that followed. However, the USD-adjusted value of the index has remained relatively constant since then, which is significant given the substantial regional risks and ongoing conflict with Israel.

Tunisia's stock market appears to be the best-performing market in the sample, at least in terms of providing consistent excess returns over the US and EU markets. The Tunindex continued its upward trend in most of the financial crisis with the exception of a relatively small drop in the second half of 2008. The market was buoyant in most of 2009 and reached historical levels by the end of 2010. However, the Arab spring did have a short negative impact, albeit short-lived, with accumulated losses of 15% between January and February 2011. Following those dates, the index remained relatively stable up until November 2012.

Much like that of Israel, **Turkey's** stock market has been highly sensitive to the changing global conditions. In particular, the Istanbul Stock Exchange index (ISE-100) has dropped a staggering 60% in the second half of 2008 following the Lehman bankruptcy. After this event, the market

index inched upwards until 2011. Turkey's exposure to the EU could be the main force behind the drop in the stock market index in early 2011, corresponding to the eurozone crisis. Since early 2012, however, the ISE-100 index has improved consistently, which is most likely due to the re-emergence of the country as an alternative investment destination globally.

3.7 Methodology

The data used in the contagion analysis are based on weekly averages from eight stock markets in the region and key commodity indices from beginning of 2006 until November 2012.[7] Stock market indices are obtained from MSCI and national sources, with the latter being the preferred source whenever available. For commodity prices, the Dow Jones-UBS commodity indices on oil and wheat were used.[8]

As noted above, two complementary methods are used to assess the presence of independence and contagion effects.

3.7.1 Index trend model

The first structural time series model relies on the techniques developed by Harvey (1989) and Harvey & Shephard (1993). The structural system is used to control for non-stochastic trends and stochastic attributes by representing the observed time series in terms of its unobserved components. The procedure allows for a better estimation of whether interdependence has taken place.

More specifically, the model can be specified by the system of equations:

$$\ln p_t = \mu_t + \delta \ln p^o_{t-1} + \varepsilon_t \quad (2)$$

$$\mu_t = \mu_{t-1} + \eta_t, \quad (3)$$

Where p is the stock market index (defined in US dollars), □ is the stochastic trend term, □ and □ are normal and random walk errors and □ is

[7] Although daily data were available for all countries, they were not used in the analysis due to different vacation days within each country. Note that all stock indices were adjusted in US dollar terms.

[8] The Dow Jones-UBS commodity indices are based on futures prices for physical commodities, which specify a pre-determined date for the delivery of the underlying physical commodity. In order to maintain a long position, expiring contracts must be sold and replaced by purchases of contracts that are farther from maturity, also known as rolling futures positions.

the sensitivity of the considered market to the origin (i.e. US, EU or commodity) market. A sharp rise in the sensitivity coefficient from one period to the next one implies a stronger independence over time, suggesting that contagion could have taken place.

3.7.2 Return volatility model

In addition to the structural time series model, the second approach considers the possibility that that market volatility may change over time, potentially biasing the correlation estimates for the market indices.

$$r_t = \gamma_0 + \gamma_1 r_{t-1} + \gamma_2 r^o_{t-1} + \varepsilon_t \quad (4)$$

Where r is the vector of index returns, r^o represents the index returns in the origin country (i.e. US), and the error term is $\varepsilon_t | \Lambda_{t-1} \sim N(0, H_t)$, conditional on information set in a prior period. In line with Engle's (2002) dynamic conditional correlation (GARCH-DCC) model, the multivariate conditional co-variance matrix H is assumed to be decomposable into time-varying standard deviation and correlation matrices:

$$H_t = D_t R_t D_t . \quad (5)$$

The estimation process follows a two-stage procedure. Intuitively, the first stage estimates the time-dependent standard deviations using a simple GARCH model. In the second stage, these estimates are used to adjust the error terms from the original regression to estimate dynamic motion to characterise the correlations. More specifically, in the first stage, GARCH(1,1) models are estimated for each one of the stock returns, resulting in estimates for standard deviations of the error terms, or:

$$D_t = \text{diag}(\sqrt{h_{it}}).$$

In the second stage, the stock return residuals are transformed by the estimated standard deviations:

$$u_{it} = \varepsilon_{it} / \sqrt{h_{it}} ,$$

Which are used to estimate the dynamic correlation parameters, $R_t = (\rho_{ij,t})$.[9] The evolution of the correlation parameters in the model is determined dynamically by a linear combination of the prior correlation as well as the unconditional and actual (lagged) covariances of u:

[9] See Engle (2002) and Chiang et al. (2007) for more details on the GARCH-DCC model and its properties.

$$Q_t = (1-\alpha-\beta)E[u_t u_t'] + \alpha[u_{t-1}u_{t-1}'] + \beta Q_t \quad (6)$$

Where $\alpha + \beta < 1$. The dynamic correlations are then found by scaling $Q_t = (q_{ij,t})$, so that

$$\rho_{ij,t} = q_{ij,t} / \sqrt{q_{ii,t} q_{jj,t}}. \quad (7)$$

As noted above, contagion has to be distinguished from a peak in correlations following a rare event. For that purpose, the dynamic correlations obtained by the procedure above are further regressed using time dummies. More specifically, the persistence of the contagion effect is assessed using an AR(1) model:

$$\rho_{ij,t} = \varphi_0 + \varphi_1 \rho_{ij,t-1} + \varphi_2 D_t + e_{ij,t}, \quad (8)$$

Where $e_t | \Lambda_{t-1} \sim N(0, M_t), M$ is the conditional variance of e determined by a GARCH(1,1) process and D is the time dummies for crisis periods. The effect of contagion can then be deemed to be persistent if the estimates for φ_2 are significantly different than zero.

3.8 Results

3.8.1 Index-trend model

The results for the index-trend model are provided in Table 3.12 and Table 3.14. The correlations consider three distinct periods. The pre-crisis period runs from 1 January 2007 until the bankruptcy procedures of Lehman Brothers, 15 September 2008. The post-crisis period starts the day following the Lehman event until the ousting of Mubarak on 10 January 2011. The post-Mubarak period runs until the end of the sampling period on 5 November 2012.

The correlation coefficients between the region's stock markets and commodity indices highlight several interesting findings. First, oil and grain prices are strongly and positively correlated with the stock markets of all countries except Lebanon, Morocco, Palestine and Syria. For Tunisia, grain prices have a positive impact on Tunisia's stock market returns, although the impact is relatively small. The commodity prices heavily influence the market returns in the relatively advanced countries, such as Israel, Turkey, the US and Europe.

Table 3.12 Correlations with commodity indices

	Brent oil				Grains			
	Entire period	**Pre-crisis**	**Post-crisis**	**Post-Mubarak**	**Entire period**	**Pre-crisis**	**Post-crisis**	**Post-Mubarak**
Egypt	0.17***	0.24***	0.24***	0.16	0.23***	0.12	0.25*	0.41***
Israel	0.23***	0.09	0.28***	0.24***	0.18***	0.04	0.32***	0.12
Jordan	0.08***	0.01	0.08*	0.00	0.11***	0.12	0.09	0.07**
Lebanon	0.03	-0.1*	0.06	-0.0	0.04	-0.0	0.08	0.03
Morocco	-0.0	-0.0	-0.1***	0.05	0.06	-0.0	0.07	0.10
Palestine	-0.0	-0.1**	0.00	0.02	0.03	-0.0	0.16*	-0.0
Syria	0.00	..	0.02	-0.0	0.00	..	0.07	-0.0
Tunisia	0.01	-0.0	0.00	0.11	0.07**	-0.0	0.03	0.14**
Turkey	0.31***	0.07	0.35***	0.27***	0.19***	0.05	0.31***	0.11
US	0.22***	-0.0	0.31***	0.29***	0.24***	-0.0	0.42***	0.21***
Europe	0.29***	-0.0	0.35***	0.40***	0.28***	-0.0	0.48***	0.27***

Notes: Figures depict the sensitivity of the stock market returns to commodity prices, as defined in equation (2). ***,**,* stand for significance at 1%, 5% and 10%.

Turning to how correlations evolved throughout the sampling period, the results show that the correlations clearly increased in Israel, Turkey, the US, and Europe after the crisis (up until the ousting of Mubarak). The same is also true only for grains in Egypt, especially after the onset of the Arab spring. The correlation with grains also increased in the post-crisis period, up until January 2011, for Palestine. The correlation of the market returns with Brent oil increased in Jordan, but only weakly so.

The correlation of the market returns with the US and EU markets, as depicted in Table 3.13, highlight a close relationship between these countries. Clearly, the correlations with the US and EU are extremely strong for Egypt, Israel and Turkey. The results show that the relationships have not increased after the crisis for most cases, except for Egypt (with the US only), Tunisia (only weakly) and Jordan (relatively strongly so). Even though Israel and Turkey's stock markets display the closest interdependence with both the EU and the US, the relationship has not become more sensitive after the crisis or the ousting of Mubarak.

Table 3.13 Correlations with the US and Europe

	US				EU			
	Entire period	**Pre-crisis**	**Post-crisis**	**Post-Mubarak**	**Entire period**	**Pre-crisis**	**Post-crisis**	**Post-Mubarak**
Egypt	0.55***	0.40*	0.57***	0.62***	0.64***	0.75***	0.66***	0.59***
Israel	0.77***	0.90***	0.72***	0.88***	0.64***	0.80***	0.61***	0.55***
Jordan	0.17***	-0.0	0.27***	0.04	0.22***	0.22**	0.30***	0.05*
Lebanon	0.19***	0.19	0.17**	0.13	0.18***	0.16	0.16**	0.15**
Morocco	0.04	-0.2	0.02	0.21*	0.19***	0.24	0.10	0.29***
Palestine	0.09	0.04	0.15	-0.0	0.21***	0.33**	0.24***	0.11*
Syria	0.06	..	0.09	0.05	0.11*	..	0.05	0.14
Tunisia	0.12**	0.04	0.11*	0.15	0.19***	0.17**	0.22***	0.13
Turkey	0.80***	0.90***	0.80***	0.71***	0.80***	1.12***	0.82***	0.52***
USA	..	..	..	..	0.60***	0.54***	0.63***	0.56***
Europe	1.07***	0.96***	1.03***	1.22***	..	..	..	..

Notes: Figures depict the sensitivity of the stock market returns to European and US market returns, as defined in equation (2). ***,**,* stand for significance at 1%, 5% and 10%

The ousting of Mubarak has little effect on the interdependence of the region's markets with the EU or the US. Paradoxically, Egypt's interdependence with the US has slightly strengthened and that with the EU weakened after the toppling of Mubarak, although the differences are too small to gauge significance. Morocco's stock market became more sensitive to developments both in the EU and US during the Arab spring. So did Israel's stock market, but only with the US market. Tunisia's stock markets, on the other hand, became less related with the US and the EU. While these results are relatively vague, Turkey's emergence as an alternative for global investors in the region contributed to its decoupling from the US and the EU markets.

These results have to be interpreted carefully, since they simply show an increasing sensitivity, which may not be lasting and may not be significant. Moreover, inherent volatilities in the stock market returns are not clearly taken into account, which the next section turns to.

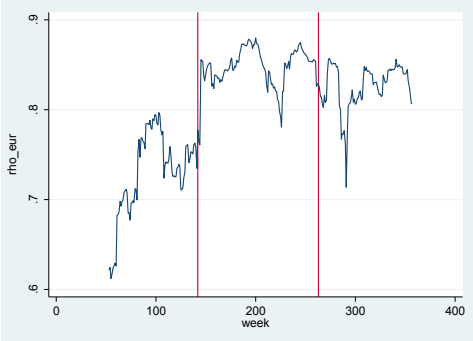
3.8.2 Return volatility model

The coefficient estimates for the GARCH-DCC model in equation (2) are summarised in the annex at the end of this chapter. The results show that the stock market returns are highly elastic to the developments in the US as well as the ARCH/GARCH terms in all of the countries, justifying the use

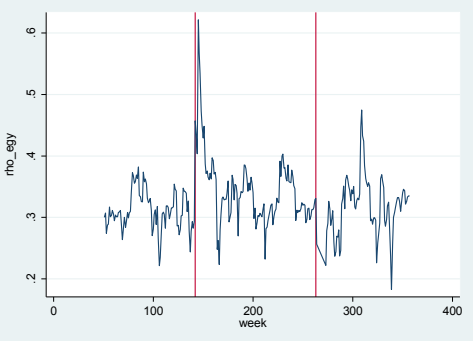
of the empirical analysis that is robust to the heteroscedasticity of error terms.

The dynamic correlations with the US DJCI market returns are depicted in Figure 3.3. A visual examination reveals that the Lehman event has had a clear and persistent upward impact on market correlations for Europe and Turkey but not in other countries. A short-lived upward impact is also present in Egypt, Morocco, Palestine and Tunisia. In turn, Israel and Jordan's correlation coefficients appear to be relatively random. The magnitude of correlation appears to be the highest in Europe, Israel and Turkey, which is most likely reflecting the closer linkages between these markets and the US.

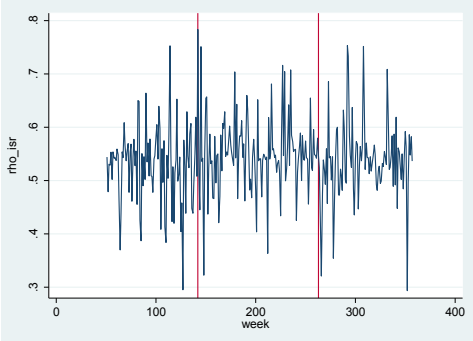
Figure 3.3 Dynamic correlations with US Dow Jones Composite Index (DJCI)



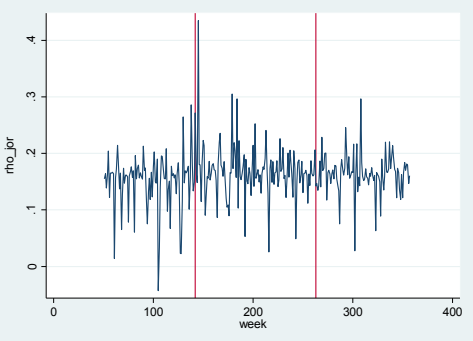
(a) Europe (Euronext-100)



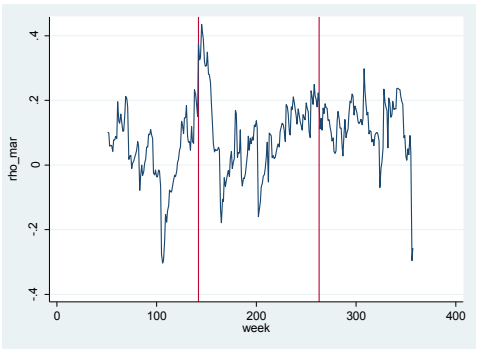
(b) Egypt (EGX-30)



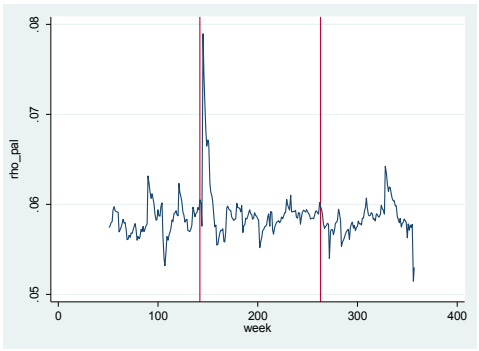
(c) Israel (TA-100)



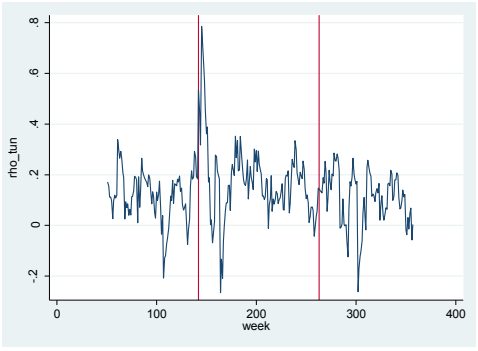
(d) Jordan (ASE Free float index)



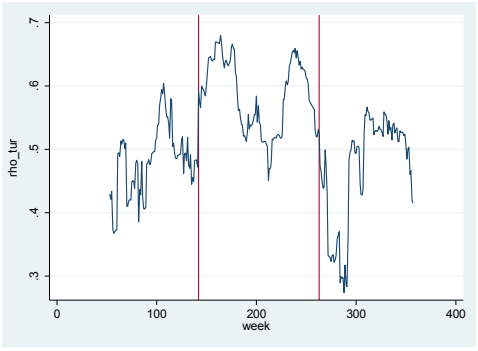
(e) Morocco (MSCI, Large & Mid cap)



(f) Palestine (Al-Quds)



(g) Tunisia (TUNINDEX)



(h) Turkey (ISE-100)

The dynamic correlation coefficients obtained from the GARCH-DCC were regressed using the AR(1) specification depicted in equation (8) to determine whether any changes that occurred in the two key events, i.e. the Lehman event on 15 September 2008 and the fall of Egypt's General Mubarak on 10 January 2011, were permanent (Table 3.14). More specifically, the regression regresses the time series depicted in Figure 3.3 using an AR(1) specification.

The empirical tests lead to the following key findings.

First, the correlation coefficients have strong persistent and dynamic factors. More specifically, all stock markets except Morocco exhibit a significant constant correlation term (φ_0). For Israel, the constant correlation is surprisingly high at 0.48. This implies that almost half of the variance in the (dollar-denominated) returns of Israel's Tel Aviv stock market index is persistently determined by the returns in US DJCI. Jordan's stock market also has a relatively high stand-alone correlation with the US DJCI,

although the magnitude is much smaller. For other countries, the persistent term is smaller than 0.1.

Table 3.14 AR(1) regression for dynamic correlation coefficients for US DJCI

	Europe	**Egypt**	**Israel**	**Jordan**	**Morocco**	**Palestine**	**Tunisia**	**Turkey**
φ_0	0.0803***	0.0668***	0.482***	0.141***	0.00442	0.0130***	0.0290***	0.0377***
	(0.0291)	(0.0117)	(0.0323)	(0.0108)	(0.00524)	(0.00165)	(0.00823)	(0.0127)
φ_1	0.892***	0.785***	0.0863	0.0537	0.881***	0.777***	0.756***	0.923***
	(0.0396)	(0.0368)	(0.0585)	(0.0585)	(0.0248)	(0.0283)	(0.0330)	(0.0248)
Lehman	0.0123**	0.0074*	0.0218**	0.0183***	0.0078	0.0002	0.0136	0.0081*
	(0.00534)	(0.00385)	(0.0102)	(0.00689)	(0.00756)	(0.000236)	(0.0110)	(0.00445)
Mubarak	-0.00321*	-0.00529	-0.0134	-0.00467	-0.00203	-0.000275	-0.0177	-0.0108***
	(0.00187)	(0.00437)	(0.00996)	(0.00566)	(0.00824)	(0.000237)	(0.0120)	(0.00389)
Obs.	301	296	305	305	305	305	301	301
R^2	0.957	0.655	0.026	0.035	0.767	0.611	0.595	0.915

Second, the dynamic correlation coefficients of most countries exhibit a strong autocorrelation term. Indeed, the AR(1) coefficients (φ_1) of all countries except Jordan and Israel are in the vicinity of 0.8-0.9. Thus, while the correlations are persistently high in Israel and to a lesser degree in Jordan, they follow a positive reinforcing pattern in the other countries. In other words, a higher correlation in one period implies a higher correlation in the next one as well. Thus, correlations appear to be self-supporting, possibly highlighting the strong two-way trade and investment linkages.[10]

Third, and perhaps most importantly for our purposes, the Lehman event has increased correlations in several countries. This is especially the case for Europe, Israel and Jordan, where the event has led to a general increase of over 1% of correlation. The correlation has also increased in Egypt and Turkey, although only by 0.7-0.8%. It should not be surprising

[10] There is some indication that many countries in the region have two-way flows with the US. The US has been running a trade surplus and an investment deficit (i.e. more flows from the region to the US than the other way around) with most countries in the region. This two-way dependency may explain the self-supporting nature of capital market co-dependencies. In turn, the US has run a large and consistent trade deficit with Israel since the late 1990s while capital inflows from the US into Israel have also been very strong. Jordan's trade and investment linkages with the US remain relatively small.

that the correlations have increased significantly for these traditional US allies in the region.

Fourth, the departure of Mubarak and the following political uncertainty have reduced the correlations in the entire sample, although the level of significance differs from one country to another. In particular, the Arab spring events appear to have reduced the US-Europe and US-Turkey correlations significantly. Turkey has decoupled from the US as its stock exchange increasingly drew more investors searching for yield among emerging markets due to the country's emergence as a stable alternative to the rest of the region. In turn, the (much-smaller) drop in correlation with Europe may be explained either by the concurrent home-grown issues in the EU (i.e. the eurozone sovereign debt crisis in 2011). More generally, the lower correlation coefficient may also mean that the troubles faced by the EU and the Arab spring might have led to a decoupling of the European economy.[11]

3.9 Synthesis and conclusions

Most of the SEMCs have been saved from the negative impact of the crisis during the initial phase of the crisis between 2007 and 2008. Banks in the region had little direct exposure to the toxic products that weakened the balance sheets of many banks in the US or the EU. However, the main impact of the global financial crisis came later, during 2009 and onwards. As economic conditions in the EU – the region's main partner – worsened, so did the external demand for the region's products, leading to drops in exports, tourism receipts and remittances. In addition, bouts of risk-aversion among global investors lowered capital inflows. The economic stimulus programmes of the local authorities did not succeed in offsetting these reductions in capital inflows. Moreover, higher international commodity prices were even severely worsening the fiscal problems in several SEMCs.

The impact of the financial crisis on the banking systems were assessed by pre- and post-crisis comparisons of the liquidity, performance, efficiency, risk and fragility.

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[11] Although not shown here, the correlation coefficient between Egypt and European capital markets have increased significantly after the departure of Mubarak. However, the results need to be interpreted with care since the data for Egypt are highly incomplete, with long gaps, which makes it a poor explanatory variable.

The liquidity position, measured by the loan-to-deposits ratio, has clearly improved in Jordan although not enough for the sample tests to highlight a statistically significant change. The LTDs for Lebanon, Morocco, Syrian, and Turkish systems have also improved significantly. Interestingly, Tunisia is the only country in the sample whose banks regularly run retail funding gaps, i.e. fewer deposits than loans, requiring alternative forms of funding to fill the gap.

The evolution of the performance of the region's banks was assessed through three related variables. The profitability measured by net interest margin (NIM) of retail operations has improved in Egypt, especially following 2008. This paradoxical result could be due to increased risk premiums charged by banks in an increasingly uncertain environment. In turn, the changes in the NIM for Lebanon, Morocco and Syria appear to be related to trend-growth rather than the crisis. Lastly, the results hint at significant negative impact of crisis in Algeria and Jordan once trend growth is accounted for. The profitability measured by RoE improved for Algeria (only for 2008-11 crisis specification), Lebanon, Syria and Tunisia. Deeper analysis, however, shows that the trend improvements and not the crisis had a role in these developments. In turn, profitability worsened under the 2008-11 crisis specification in Israel and (less strongly) in Turkey while the drop in profitability in Jordan was a trend process and not due to the crisis. Egypt has also faced a slight drop in profitability under the 2008-11 crisis specification after controlling for trend growth. The results for RoA tell a similar story.

The cost-income ratios measuring efficiency have dropped in several countries, including Lebanon, Morocco and Tunisia, which point at lower costs and increased efficiency. However, these improvements turn out to be related to trend developments, with the exception of Lebanon where efficiency gains actually became speedier during the crisis. In turn, heavy losses were suffered in some countries (e.g. Syria in 2007). Israel has, for example, clearly faced increasing costs under the crisis specification for the period 2008-11. This is the case even after controlling for trend-growth.

Fragility and risks in the banking system are assessed through three distinct indicators. It is clear from the figures that the first indicator, capital ratios, have improved during the crisis in almost all of the sampled countries, except Turkey although this appears to be due to the trend. Moreover, the figures for the second indicator, impaired loans, show clearly worsening conditions for several countries. In particular, NPL ratios have increased in Jordan, Morocco, Syria and Turkey, even after accounting for trend growth in all cases. In the case of Morocco, the results are less

reliable due to limited data; however, the NPL rates in Jordan have nearly doubled during the crisis. The last indicator considered in the section is a distance-to-default estimate, or the Z-score. Surprisingly, the results show several improvements. In particular, banks have become less fragile in Algeria, Jordan and Syria. The results of the trend-adjusted model show that these improvements were due to the crisis in Algeria and Syria but not in Jordan. More in line with expectations, banks became more fragile in Israel and Tunisia, although in the latter case the worsening conditions are part of the trend.

Overall, the results underline that the impact of the financial crisis on the banking sectors in the SEMCs was limited. As shown in Table 3.15, most of the measures were only weakly affected or following the (positive) trend. The more developed banking sectors of Israel and Turkey formed the only exceptions. In Israel both the performance and efficiency deteriorated, while the system became more fragile. In the case of Turkey, both liquidity and performance worsened and the banking system became more fragile.

As is clear from the figures, the impact of the financial crisis on the capital markets varies from country to country. In particular, as of November 2012, the Israeli, Tunisian and Turkish stock exchanges have outperformed the US Dow-Jones index during the global crisis. At the same time, the Egyptian, Jordanian, Palestinian and Syrian indices remained below their January 2007 levels.

The correlation coefficients between the region's stock markets and commodity indices highlight several interesting findings. The results show that the correlations clearly increased in Israel, Turkey, the US and Europe after the crisis (up until the ousting of Mubarak). The same is also true only for grains in Egypt, especially after the onset of the Arab spring. The correlation with grains also increased in the post-crisis period, up until January 2011, for Palestine. The correlation of the market returns with Brent oil increased in Jordan, but only weakly so.

Table 3.15 Overview of the impact of the financial crisis on banking sector and capital market

	Impact on banking sector				Capital market correlation		
	Liquidity	**Performance**	**Efficiency**	**Fragility**	**Commodities**	**US**	**EU**
Algeria	Weak	Strong □ (due to trend?)	Weak	Strong □ (weakened with trend)	..	..	..
Egypt	Weak	Mod. □	Weak	Strong □ (due to trend)	Mod.; □ (grains)	Strong; □ (post-crisis)	Strong; □ (post-crisis)
Israel	Weak	strong□	Mod. □	Mod. □	Strong; □ (post-crisis)	Strong; □ (post-crisis)	Strong; □ (post-crisis)
Jordan	Weak	Mod. □	Weak	Mod. □ (due to NPL)	Weak	Mod.; □ (post-crisis)	Mod.; □ (post-crisis)
Lebanon	Weak	Strong □ (weakened with trend)	Mod. □	Weak	Weak	Moderate	Moderate
Morocco	Strong □ (due to trend)	Mod. □ (only with trend)	Mod. □ (due to trend)	Mod. □ (due to NPL)	Weak	Moderate	Moderate
Palestine	..	..	..	..	Weak	Moderate	Moderate
Syria	Strong □ (weakened with trend)	Mod. □ (due to trend)	Weak	Mod. □ (due to NPL)	Weak	Moderate	Moderate
Tunisia	Weak	Mod. □ (due to trend)	Mod. □ (due to trend)	Weak	Weak	Moderate	Moderate
Turkey	xx□ (reversal with trend)	Mod. □	Weak	Mod. □ (due to NPL)	Strong (oil); □ (post-crisis)	Strong; □ (post-crisis); □ (Arab Spring)	Strong; □ (post-crisis)

The correlation of the market returns with the US and EU markets highlight a close relationship between these countries. Clearly, the correlations with the US and EU are extremely strong for Egypt, Israel and Turkey. The results show that the relationships have not increased after the crisis for most cases, except for Egypt (with the US only), Tunisia (only weakly) and Jordan (relatively strongly so). Even though Israel and Turkey's stock markets display the closest interdependence with both the EU and the US, the relationship has not become more sensitive after the crisis or the ousting of Mubarak.

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ANNEX

REGRESSION RESULTS OF RETURN VOLATILITY MODEL (GARCH-DCC)

The return volatility is estimated by the following model:

$$r_t = \gamma_0 + \gamma_1 r_{t-1} + \gamma_2 r^o_{t-1} + \varepsilon_t$$

Where r is the vector of index returns, r^o represents the index returns for the Dow Jones Composite Index (DJCI) in the US, and the error term follows a dynamic GARCH(1,1) process that is assumed to be decomposable as defined in equations (5) to (7).

Table 0.1 GARCH dynamic conditional correlation (GARCH-DCC) estimates

	Europe	**Egypt**	**Israel**	**Jordan**	**Morocco**	**Palestine**	**Tunisia**	**Turkey**
γ_0	0.231*	0.158	0.214*	-0.106	0.0402	-0.207**	0.299***	0.391**
	(0.119)	(0.176)	(0.113)	(0.0672)	(0.121)	(0.100)	(0.0888)	(0.163)
γ_1	0.178***	0.133**	0.134***	0.234***	0.149***	0.202***	0.244***	0.320***
	(0.0484)	(0.0557)	(0.0514)	(0.0574)	(0.0571)	(0.0534)	(0.0604)	(0.0453)
γ_2	0.244***	0.557***	0.574***	0.172***	0.0734	0.338***	0.257***	0.445***
	(0.0929)	(0.104)	(0.0796)	(0.0348)	(0.0620)	(0.0512)	(0.0408)	(0.104)
ARCH term	0.0933***	0.136***	0.143***	0.331***	0.150**	0.168***	0.611***	0.103***
	(0.0256)	(0.0476)	(0.0460)	(0.0839)	(0.0585)	(0.0495)	(0.131)	(0.0350)
GARCH term	0.843***	0.789***	0.800***	0.645***	0.731***	0.823***	0.180**	0.847***
	(0.0471)	(0.0758)	(0.0618)	(0.0704)	(0.0910)	(0.0435)	(0.0762)	(0.0632)
Obs.	349	344	352	352	352	352	349	349

The results show that with the exception Morocco, DJCI is a significant determinant in all markets. It is important to note that according to the specification of this model, the coefficient estimates do not imply directly a correlation

4. DEBT SUSTAINABILITY ASSESSMENT IN EGYPT AND TUNISIA

DAMYANA BAKARDZHIEVA AND BASSEM KAMAR

Debt sustainability occurs when a country can meet its current and future debt service obligations in full, without recourse to debt relief, debt rescheduling or the accumulation of arrears and without compromising growth. Assessing debt sustainability in the first instance means forming a view of how outstanding stocks of liabilities are likely to evolve over time. This requires projecting the flows of revenues and expenditures, including those for servicing debt, as well as the exchange rate changes (given the currency denomination of the debt). Projections of the debt dynamics thus depend, in turn, on macroeconomic and financial market developments, which are intrinsically uncertain and highly variable (IMF, 2002).

An increase of the debt ratio to unsustainable levels not only constitutes additional constraints on the government and a need for fiscal tightening at times when perhaps such a policy is not optimal, but it also worsens the perceptions of market participants of the economy and could lead to many negative outcomes, such as capital outflows, scarce financing possibilities of the budget deficit and interest rate spikes due to higher country risk. Therefore, there is a need to provide policy-makers with several scenarios about the macroeconomic and financial perspectives, in order to raise their awareness related to any possible increase in the debt-to-GDP ratio.

In recent years, the Southern and Eastern Mediterranean countries (SEMCs) were facing several shocks that could have seriously affected their debt sustainability. In 2009, the global financial crisis affected several countries, leading to an unexpected economic slowdown, capital flight and loss of reserves. Since then, the Arab spring erupted in several countries leading to even more serious challenges that need to be taken into consideration when assessing debt sustainability.

The uprisings in the SEMCs were mainly driven by the claim of the populations to receive more social justice. They led to the change of the

regimes in Tunisia, Egypt and Libya; and the situation in Syria, even though still unclear at the time of writing, will most probably lead to a change in the economic regime in the same vein. This situation can encourage some governments to increase public spending without necessarily an equivalent increase in revenue, leading to a larger budget deficit and an increase in the overall level of debt.

In order to assess fiscal sustainability in the SEMCs, we design three different scenarios: 1) a realistic scenario that would take a stance on the plausible evolution of the economic situation in each country; 2) an optimistic scenario where the new government succeeds in improving the economic situation significantly; and 3) a pessimistic scenario, in which growth will decline for an extended period of time.

We will apply these three scenarios to the cases of Tunisia and Egypt, as they represent distinguished and insightful examples for the other SEMCs. The same can be applied to the other countries.

While Tunisia entered the global crisis and the Arab uprisings with an acceptable level of debt and a healthy economy, Egypt had a much higher debt level and significant macroeconomic instability. On another front, Tunisia seems closer to achieving a democratic transition towards a political system that might positively affect its economic performance. Egypt, however is still struggling to achieve this after the Mubarak transition, the failure of the Muslim Brotherhood to anchor democracy and the return of the military to power, and significant signs of a stable regime change are not yet in evidence.

Following this introduction, section 4.1 introduces the debt sustainability assessment model and template, highlights the shortcomings in the way in which the Article IV consultation implements the framework and presents our three scenarios. Sections 4.2 and 4.3 present the applications on Tunisia and Egypt respectively. The final section of this chapter offers conclusions and highlights some important policy implications.

4.1 The debt sustainability framework

This section starts by presenting the IMF approach to debt sustainability, which we rely upon as the foundation of our analysis. We depart from the IMF approach mainly in the underlying assumptions used for forecasting the different variables that affect debt sustainability. At the end of this section, we present our scenarios that reflect our view on the economic prospects for Tunisia and Egypt. The exercise can then be reproduced for

any other country with particular attention paid to tailoring the forecasts to the economic reality on a case-by-case basis.

4.1.1 The IMF approach to debt sustainability

It is useful to start with a definition of ***debt sustainability*** as a situation, in which a borrower is expected to be able to continue servicing its debt without an unrealistically large future correction to the balance of income and expenditure (IMF, 2002). Sustainability rules out any of the following: a situation in which debt restructuring is already needed (or expected to be needed); a situation where the borrower continues indefinitely to accumulate debt faster than the growth rate of its capacity to service this debt (a Ponzi game); or a situation in which the borrower lives beyond its means by accumulating debt in the knowledge that a major retrenchment will be needed to service this debt (even if nothing in the external environment changes). The cost of financing is a key factor influencing debt accumulation (i.e. the present value budget constraint), and thus debt sustainability. Sustainability therefore incorporates the concepts of solvency and liquidity, without making a sharp demarcation between them.

Moreover, the assumption that major corrections in income or expenditure are not expected captures the notion that there are social and political limits to adjustment that determine willingness (as opposed to ability) to pay. This factor may be especially important in the context of sovereign debt.

There are a number of related concepts used in the discussion of debt dynamics, as presented below.

Solvency

An entity is solvent if the present discounted value (PDV) of its current and future primary expenditure is no greater than the PDV of its current and future path of income, net of any initial indebtedness.

$$\sum_{i=0}^{\infty} \frac{E_{t+i}}{\prod_{j=1}^{i}(1+r_{t+j})} \leq \sum_{i=0}^{\infty} \frac{Y_{t+i}}{\prod_{j=1}^{i}(1+r_{t+j})} - (1+r_t)D_{t-1}$$

Where E is expenditure, Y is revenue, r is the discount rate and D is the stock of debt.

Solvency needs to be viewed in relation to the adjustment path that is not only economically feasible, but also socially and politically acceptable, such that default is not a preferred option.

Liquidity

An entity is illiquid if, regardless of whether it satisfies the solvency condition, its liquid assets and available financing are insufficient to meet or roll-over its maturing liabilities.

The distinction between solvency and liquidity is sometimes blurred because illiquidity may be manifested in rising interest rates – in the limiting case that no further financing is available, the marginal interest rate becomes infinite – which eventually calls into question the entity's solvency.

Accordingly, it is useful to define sustainability and vulnerability (see below).

Sustainability

An entity's liability position is sustainable if it satisfies the present value budget constraint without a major correction in the balance of income and expenditure, given the costs of financing it faces in the market.

Vulnerability

Vulnerability is simply the risk that the liquidity or solvency conditions are violated and the borrower enters a crisis.

More generally, assessments of sustainability must be predicated on the path of both policy variables (such as expenditure or tax rates) and of endogenous variables, such as interest rates and growth rates. But around this central projection there will be a number of risks. For instance, the balance of income and expenditure may deteriorate to an extent that the debt dynamics are no longer sustainable. On the income side, this would typically reflect a prolonged downturn or adverse developments in export markets. On the expenditure side, there may be increases in outlays that are unforeseen or difficult to avoid – such as demographic changes that impose a rising burden on (unfunded) social security systems.

Assessments of sustainability are thus inherently probabilistic and no framework can dispense with the need for making judgments; at best, it can help inform such judgments. What constitutes a 'major correction' may depend very much on the particular history and circumstances of the country.

4.1.2 The IMF template

The IMF fiscal sustainability template[12] analyses the behaviour of the debt-to-GDP ratio, with all variables expressed in domestic currency. In formulating the baseline projection, several issues need to be considered, including the definition of debt, the coverage of the public sector and the treatment of contingent liabilities. In general, it is recommended that the definition of debt be based on gross liabilities, and that the coverage of public debt be as broad as possible, including, where feasible, public enterprises as well as local governments.

The underlying equation for the evolution of public debt is:

$$D_{t+1} = \lfloor (1+\varepsilon)(1+r_f)DF_t \rfloor + (1+r_d)DD_t - PB_{t+1}$$

Where D_{t+1} is the total stock of debt at time *t+1*, and *PB* is the primary balance. The debt stock is composed of debts denominated in both domestic and foreign currencies. Domestic-currency debt (DD_t) evolves according to the interest rate in the market (r_d), while the evolution of the foreign-currency debt (DF_t), expressed in domestic currency, is affected not just by the foreign interest rate (r_f)but also by changes in the exchange rate ($\varepsilon = \frac{e_{t+1} - e_t}{e_t}$ with *e* defined as *units of local currency per US dollar*).

A depreciation of the local currency $(\varepsilon > 0)$ leads to an increase in foreign currency debt, expressed in local currency terms. In the template all foreign-currency debt is assumed to be in US dollars. However, if this is not an appropriate assumption in a particular country, one could feasibly derive (□) as a weighted average, or express it in terms of the dominant currency in the debt stock, if this is not the US dollar.

The analysis looks at debt stocks relative to GDP. Therefore, we define lower-case variables and upper-case variables expressed as a

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[12] This section draws exclusively on the IMF's 2008 "Staff Guidance Note on Debt Sustainability Analysis for Market Access Countries" (www.imf.org/external/np/pp/eng/2008/070308a.pdf).

proportion of GDP (e.g. $d_{t+1} = \frac{D_{t+1}}{Y_{t+1}}$). The above equation can be expressed, in percent of GDP, as:

$$d_{t+1} = \left[\frac{(1+\varepsilon)(1+r_f)}{(1+g)(1+\pi)}df_t\right] + \frac{(1+r_d)}{(1+g)(1+\pi)}dd_t - pb_{t+1}$$

With (□) representing the change in the domestic GDP deflator, and *g* the real GDP growth rate. Simple algebra yields:

$$d_{t+1}(1+g+\pi+g\pi) = (1+\varepsilon)(1+r_f)df_t + (1+r_d)dd_t - (1+g+\pi+g\pi)pb_{t+1}$$

Expanding terms and rearranging, with $d_t = df_f + dd_t$

We get:

$$d_{t+1}(1+g+\pi+g\pi) = d_t + \varepsilon(1+r_f)df_t + (r_f df_t + r_d dd_t) - (1+g+\pi+g\pi)pb_{t+1}$$

Since data on domestic and foreign interest rates may not be consistently available, the equation is further simplified. Letting (□) be the *share of total public sector debt incurred in foreign currency, that is* $(df_t = \alpha d_t)$, the third term on the right-hand side of the equation can be rewritten as $\hat{r}d_t$, where $\hat{r}$ is a weighted average of domestic and foreign interest rates $(\hat{r} = \alpha r_f + (1-\alpha)r_d)$.

Adding and subtracting $(g+\pi+g\pi)d_t$ to the right-hand side, allowing (r_f) to be approximately equal to $(\hat{r})$, and rearranging the equation leads to the following equation, which forms the basis for the fiscal template:

$$d_{t+1} - d_t = \frac{1}{(1+g+\pi+g\pi)}(\hat{r} - \pi(1+g) - g + \varepsilon\alpha(1+\hat{r}))d_t - pb_{t+1}$$

The fiscal template identifies different channels that contribute to the evolution of the debt-to-GDP ratio: the primary deficit and the endogenous/automatic factors, which include the real interest rate, real GDP growth and exchange rate movements. The contribution of the real interest rate to the evolution of the debt ratio is defined in the template as

$\left(\frac{\hat{r}-\pi(1+g)}{(1+g+\pi+g\pi)}\right)$, the contribution of the real growth rate as $\left(-\frac{g}{1+g+\pi+g\pi}\right)$ and that of the exchange rate depreciation as

$$\frac{\varepsilon\alpha(1+\hat{r})}{(1+g+\pi+g\pi)}.$$

The separation of the different factors allows us to assess their relative importance for the evolution of the debt ratio. It also serves as the basis for stress tests, which consist of a number of permanent shocks to these variables.

The template also includes other debt-creating or debt-reducing flows, e.g. from recognition of contingent liabilities or privatisation receipts. Changes in gross debt arising from other below-the-line operations, such as repayment of debt financed by a reduction in financial assets, and cross-currency movements are included in a residual.

In addition to the debt-to-GDP ratio (and the implicit path of the debt-to-revenue ratio), the template pays explicit attention to the gross financing needs of the public sector (defined as the public sector deficit, plus all maturing debt) deriving it for the baseline in percent of GDP and in billions of dollars.

The template also calculates the debt-stabilising primary balance: this is the primary balance required to keep the debt level (as a ratio of GDP) constant if all the relevant variables in the debt dynamics equation stated earlier remained at the level reported in the last year of projection.

The historical average scenario presents an alternative evolution of the debt ratio under the assumption that all key variables are at their respective historical averages throughout the projection period. The template calculates averages over the ten-year period, and uses that information to project debt dynamics five years ahead.

This scenario is a rough test of the 'realism' of baseline projections; the baseline projections may be argued to be overly optimistic when they differ remarkably from predicted debt evolution if historical patterns were followed. Of course, this scenario may be somewhat misleading if significant changes in economic policies have taken place in recent history – using the early years of transition, for instance, would bias the 'historical' value of certain parameters and thus might result in too high a debt ratio.

More generally, circumstances reflecting credible changes in policies (and thus lower baseline debt ratio projections) may look anomalous in

comparison. In any case, using this scenario – and justifying any large anomalies – could usefully discipline baseline projections.

4.1.3 Shortcomings in the IMF sensitivity tests

In addition to the baseline projections based on the IMF staff forecasts of the economic situation predicted to prevail in the coming five years, and the historical scenario based on the 10-year averages of the main economic indicators, the IMF also presents in its Article IV consultation report for every member country a set of sensitivity analyses (also called stress tests). These sensitivity analyses are standard for *all countries*, and are based on introducing negative shocks using a permanent 1/4 of a standard deviation shock to the 10-year historical real interest rate, growth rate and primary balance, in addition to a real depreciation shock to contingent liabilities of 30% and 10% of GDP.

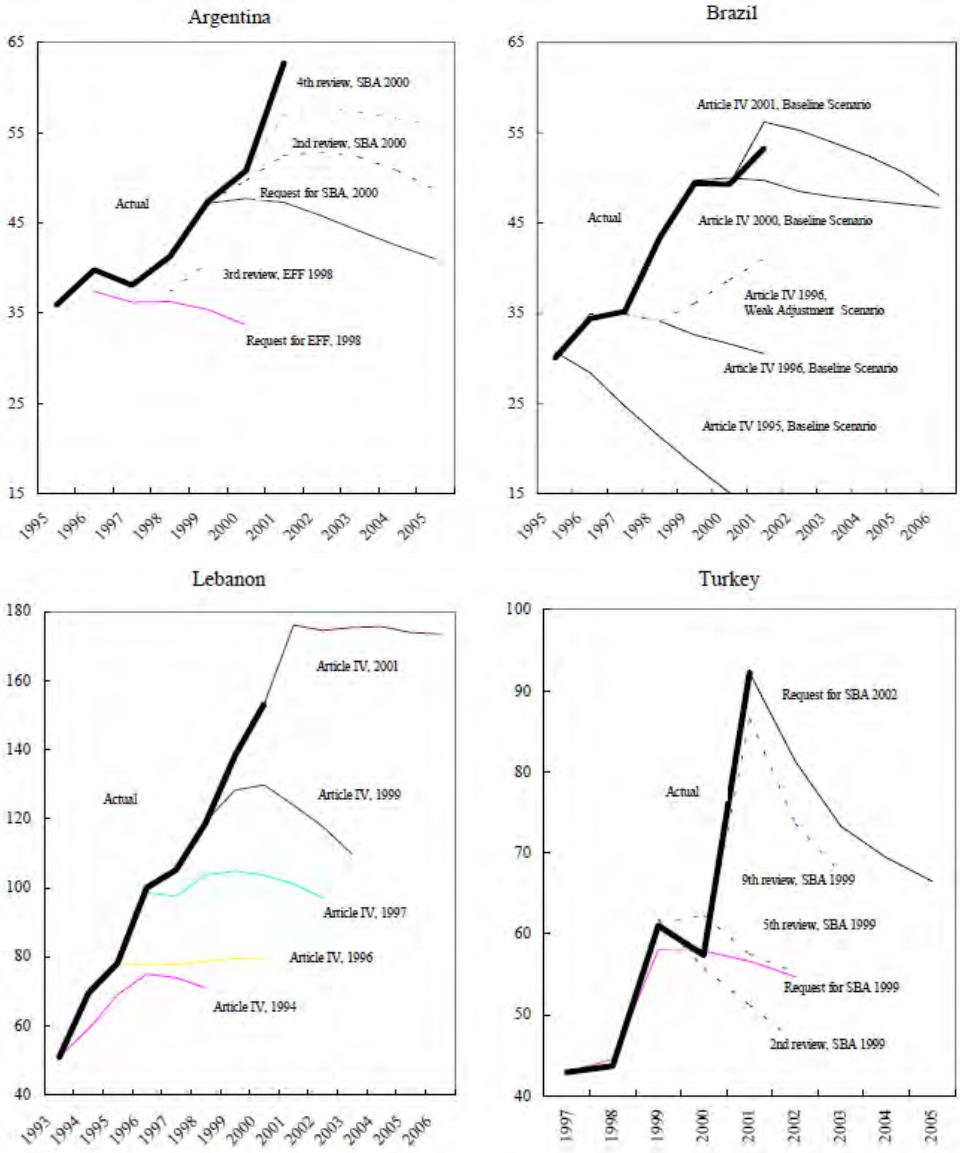
We have some concerns regarding the appropriateness of introducing standardised shocks to the historical values, but also regarding the accuracy of IMF forecasts. Applying the exact same shock to all countries will never reflect the reality of a specific economy and the severity of any potential turmoil the country might be facing in the future. In addition, IMF forecasts are often overly optimistic and hardly match the reality with regards to growth and inflation.

Indeed, the advantage of the standardised shocks is that they might allow for easy cross-country comparisons, and are also simple and easy to implement by the desk economists, who just have to enter some basic data in the template already preset to provide them automatically with elegant graphs and tables. However, the latter are often meaningless and misleading.

The following graphs show how biased the IMF forecast of the debt can be, and this could turn out to be catastrophic for the countries that follow the IMF assessment and incur more debt when the reality is much gloomier; the outcome is often a debt explosion. Clearly, the actual debt-to-GDP ratios in all four countries depicted in Figure 4.1 were far more significant than those projected in the respective Article IV consultation reports.

Our objective is to perform more reasonable and targeted stress tests for two SEMCs, i.e. Tunisia and Egypt, starting from the IMF baseline scenario, but using motivated country-specific and context-appropriate assumptions for the future development of the respective macroeconomic variables.

Figure 4.1 Projections of public debt-to-GDP ratio: Selected emerging market countries



Source: IMF (2002).

4.1.4 Our scenarios for the debt sustainability of Tunisia and Egypt

In order to assess the fiscal sustainability in the two countries chosen, three different scenarios are designed:

1. A realistic scenario that would take account of the plausible evolution of the economic situation in each country.
2. An optimistic scenario, in which the new (post-revolutionary) government succeeds in improving the economic situation significantly.
3. A pessimistic scenario, in which growth will decline for an extended period of time.

Scenario 1. The realistic assessment

The realistic scenario is mainly based on the interpretation of the latest signs of economic recovery (or turmoil) that we receive from each country based on the latest data available. It will assume a low growth rate for the years 2012 and 2013, followed by a steady recovery in 2014 and 2015. Inflation and exchange rate movements will remain close to their 2011 and 2012 levels. Revenues will be a function of GDP growth, but expenditures will witness a noticeable increase to reflect the governments' commitments to respond to the populations' claims for higher social transfers and public jobs. Budget deficits will increase, but the authorities will not have difficulties in finding sources of financing, especially foreign financing in the form of aid or loans from international organisations and the G20 countries. In the external sector, trade will continue to be subject to the main trading partners' economic conditions, and tourism will start reviving if the political transition is confirmed and security is established. Foreign direct investment and portfolio investments will remain low for 2012 and 2013 but might start increasing after that, conditional on the accomplishment of the political transition, the stability of the macroeconomic indicators and the establishment of security. The local banking systems have already proved themselves to be crisis-proof, both during the global financial crisis and the revolutions, so no particular signs of a banking crisis in any of the two countries are foreseen.

The scenarios might differ in each country, based on their historical economic situation and the potential realistic outcomes that we perceive for the coming four years.

Scenario 2. Optimistic perspectives

Assuming that the newly elected governments succeed in convincing their partners to support them with aid or low interest loans (as was promised by the G20), financing budget deficits will no longer be an issue. This in itself can be very comforting for the business community which will be

more inclined to reinvest. Households will also feel less concerned and will resume a normal consumption pattern. The optimistic perspectives also include the recovery of the main trading partners (e.g. the EU) and the increase of their demand for SEMCs' exports.

As a result of these positive perspectives, the region's GDP will grow at a higher and sustainable rate, generating higher revenue for the government. Expenditure will still increase to respond to the people's needs but not as much as in the two other scenarios. Should the private sector play its role in reducing unemployment, the public sector will have less to spend on job creation and wage increases. With available foreign financing, exchange rates will not suffer from depreciation pressures, and the pass-through to inflation will be limited, decreasing the need for increasing subsidies for some goods (usually oil and wheat).

With less deficit-financing needed, interest rates will remain low and the banking sector will be able to play its role in providing credit to the private sector, especially to small- and medium-sized enterprises. It's also relevant to mention that the feeling among the people that they have succeeded with their revolutions will boost their morale and will increase their productivity, even further enhancing GDP growth and the overall economic activity.

Scenario 3. The pessimistic outlook

It is very important to try to come up with a coherent 'worst case' scenario, so that we can identify all the challenges and let policy-makers be ready to face some of them, or at least to understand what can be the outcome if the situation gets worse. In this simulation, we will assume that the political transition is not taking place smoothly, which negatively affects the business environment in the two countries. Investment will decline, both foreign and domestic, and consumption will also decline as savings increase in times of uncertainty. It might even lead to capital outflows and pressures on the exchange reserves, especially since we will also assume an extended economic slowdown of the trading partners. This situation will lead to a sharp and extended decline in GDP growth, which would be combined with an increase in inflation should the exchange rate depreciate.

Budget revenue will decline as a result of the drop in investment and consumption, but the government will keep increasing its current spending to sustain the economy and satisfy the people's demand for higher social transfers, subsidies, wages and public jobs. Financing might become an issue as markets, international organisations and partners (G20 among others) will be reluctant to lend to what is perceived to be a transitory

and/or as illegitimate government, and will prefer to wait until the political transition is over to lend to a new government. This will make it harder for the country to borrow and will put strong pressure on the interest rates, as seen in the case of Greece, imposing a higher burden on the budget and debt levels.

4.2 Debt sustainability assessment for Tunisia

The IMF publishes a DSA (debt sustainability assessment) for all countries in its Article IV consultation report, which is available on the IMF website. The latest DSA publication for Tunisia is dated 2012, but the latest report for Egypt is from 2010, so, in order to be able to compare the pre-revolutionary data and projections with the post-revolutionary ones, we have decided to use as initial benchmarks the IMF 2010 baseline scenarios (see case studies on Tunisia and Egypt in the annex to this chapter).

In this section, we reproduce exactly the same template for Tunisia using the same data and same assumptions used in the IMF Article IV consultation reports in 2010. The aim of this exercise is to make sure that our template works properly, that all the cells in the Excel file are correctly linked and all data we are using are accurate (coming from identical sources).

We then move to the second step where we adjust our template by updating the data whenever available with the IMF's 2011 WEO (World Economic Outlook) data. The following steps reflect our own assumptions for the relevant indicators in the template, based on our *realistic, optimistic,* and *pessimistic* scenarios.

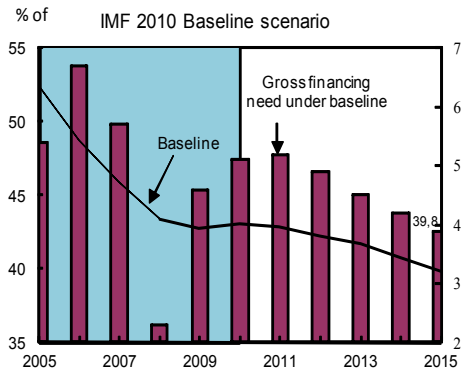
4.2.1 Replication of the IMF 2010 Article IV consultation's DSA

Figure 4.2 presents our calculation of the debt level and the gross financing needs used for the IMF 2010 Article IV consultation. This is an exact replication of the baseline and gross financing needs published in the figure ("Baseline and historical scenarios") in the IMF report (Appendix 1), except that the shaded area is expanding until 2010.

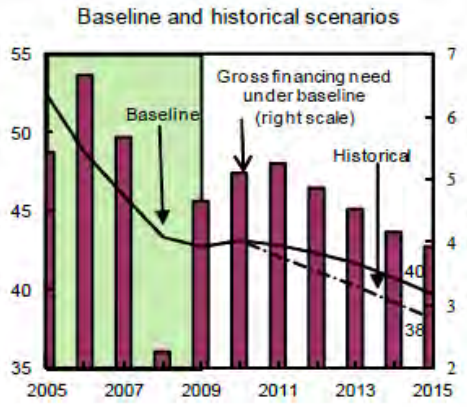
The outcome of the several calculations that allowed us to reach these results are presented in Table 4.1, where all the numbers are very close (yet not exactly the same) to those presented in the IMF 2010 Article IV Consultation report (Appendix 1), with a marginal difference not exceeding 0.2 points. The errors could be ours, due to rounding, but can also be due to some errors in the IMF report. For example, in the Article IV report we are using as reference, we found two different measures of nominal GDP, as

the GDP deflator used to calculate each one of them is not exactly the same. The GDP provided in the report on p. 20 (Table 1. Selected Economic and Financial Indicators, 2008-2015) is different from the one reported on p. 22 (Table 3. Central Government Financial Operations, 2008-2015). Forced to make a choice, we decided to use the data provided in Table 1 as they seem to be based on a more plausible GDP deflator (see Figure 4.2 and Table 4.1 below).

Figure 4.2 Baseline scenario using the data from the IMF's 2010 Article IV consultation report for Tunisia



Source: Authors' own calculations.



Source: IMF Article IV consultation 2010.

Table 4.1 Authors' replication of the DSA for Tunisia published in the IMF 2010 Article IV Consultation

(In percent of GDP, unless otherwise indicated)

	Actual						Projections				
	2005	2006	2007	2008	2009	2010	**2011**	2012	2013	2014	2015
1 **Baseline: Public sector debt 1/**	52,4	48,7	45,9	43,3	42,8	**43,1**	**42,8**	**42,3**	**41,7**	**40,8**	**39,8**
o/w foreign-currency denominated	33,5	29,1	26,8	26,4	25,0	24,2	**22,8**	21,2	19,8	18,2	16,8
2 Change in public sector debt	-1,2	-3,7	-2,8	-2,6	-0,6	0,3	**-0,3**	-0,6	-0,6	-0,9	-1,0
3 Identified debt-creating flows (4+7+12)	2,9	-9,7	-3,8	-2,3	0,2	-1,3	**-0,8**	-1,0	-1,1	-1,3	-1,4
4 Primary deficit	0,2	0,4	0,3	-1,3	0,6	1,0	**0,6**	0,7	0,8	0,6	0,5
5 Revenue and grants	26,5	26,6	27,4	29,9	29,3	28,4	**28,5**	28,2	27,9	27,8	27,8
6 Primary (noninterest) expenditure	26,7	26,9	27,8	28,6	30,0	29,4	**29,1**	29,0	28,7	28,5	28,3
7 Automatic debt dynamics 2/	3,1	-3,5	-3,3	-0,7	-0,4	-2,0	**-1,4**	-1,6	-1,8	-1,9	-1,8
8 Contribution from interest rate/growth differential 3/	-1,4	-1,9	-1,7	-2,5	-0,5	-2,0	**-1,4**	-1,6	-1,8	-1,9	-1,8
9 Of which contribution from real interest rate	0,8	0,8	1,1	-0,7	0,7	-0,5	**0,6**	0,3	0,4	0,3	0,4
10 Of which contribution from real GDP growth	-2,2	-2,7	-2,8	-1,9	-1,3	-1,5	**-1,9**	-2,0	-2,2	-2,2	-2,2
11 Contribution from exchange rate depreciation 4/	4,5	-1,6	-1,6	1,8	0,1	…	**…**	…	…	…	…
12 Other identified debt-creating flows	-0,4	-6,6	-0,8	-0,3	0,0	-0,3	**-0,1**	-0,1	-0,1	-0,1	-0,1
13 Privatization receipts (negative)	-0,4	-6,6	-0,8	-0,3	0,0	-0,3	**-0,1**	-0,1	-0,1	-0,1	-0,1
14 Recognition of implicit or contingent liabilities	0,0	0,0	0,0	0,0	0,0	0,0	**0,0**	0,0	0,0	0,0	0,0
15 Other (specify, e.g. bank recapitalization)	0,0	0,0	0,0	0,0	0,0	0,0	**0,0**	0,0	0,0	0,0	0,0
16 Residual, including asset changes (2-3) 5/	-4,1	6,0	0,9	-0,2	-0,8	1,6	**0,6**	0,4	0,5	0,4	0,4
Public sector debt-to-revenue ratio 1/	198,0	183,5	167,4	144,9	145,8	151,8	**150,3**	149,7	149,6	146,8	143,1
Gross financing need 6/	5,4	6,7	5,7	2,3	4,6	5,1	**5,2**	4,9	4,5	4,2	3,9
in billions of U.S. dollars	1,8	2,3	2,2	1,0	2,0	2,2	**2,3**	2,3	2,2	2,2	2,2
Key Macroeconomic and Fiscal Assumptions Underlying Baseline											
Real GDP growth (in percent)	4,0	5,7	6,3	4,5	3,1	3,8	**4,8**	5,0	5,6	5,7	5,8
Average nominal interest rate on public debt (in percent)	5,2	5,3	5,2	4,7	5,0	4,9	**4,6**	4,2	4,0	3,7	3,8
Average real interest rate (nominal rate minus change in	1,6	1,9	2,6	-1,4	1,9	-1,0	**1,5**	1,0	1,2	1,0	1,3
Nominal appreciation (increase in US dollar value of local	-12,0	5,1	6,3	-6,8	-0,6	…	**…**	…	…	…	…
Inflation rate (GDP deflator, in percent)	3,7	3,4	2,6	6,1	3,1	5,9	**3,0**	3,2	2,8	2,7	2,5
Growth of real primary spending (deflated by GDP deflato	4,1	6,7	9,5	7,6	8,1	1,8	**4,0**	4,4	4,7	4,8	5,3
Primary deficit	0,2	0,4	0,3	-1,3	0,6	1,0	**0,6**	0,7	0,8	0,6	0,5

1/ Indicate coverage of public sector, e.g., general government or nonfinancial public sector. Also whether net or gross debt is used.
2/ Derived as [(r - (1+g - g + (1+r)/(1+g+ +g))) times previous period debt ratio, with r = interest rate ; = growth rate of GDP deflator; g = real GDP growth rate; a = share of foreign-currency denominated debt; and = nominal exchange rate depreciation (measured by increase in local currency value of U.S. dollar).
3/ The real interest rate contribution is derived from the denominator in footnote 2/ as r - π (1+g) and the real growth contribution as -g.
4/ The exchange rate contribution is derived from the numerator in footnote 2/ as (1+r).
5/ For projections, this line includes exchange rate changes.
6/ Defined as public sector deficit, plus amortization of medium and long-term public sector debt, plus short-term debt at end of previous period.
7/ The key variables include real GDP growth; real interest rate; and primary balance in percent of GDP.
8/ Derived as nominal interest expenditure divided by previous period debt stock.
9/ Assumes that key variables (real GDP growth, real interest rate, and other identified debt-creating flows) remain at the level of the last projection year.

4.2.2 *Baseline using World Economic Outlook (WEO) 2011 data*

Once we replicated the DSA published in the IMF 2010 Article IV consultation report, we can start updating the template with more recent data, like the one published in the 2011 WEO. The aim of this step is to construct a baseline for a DSA that would incorporate IMF data reflecting the debt level in the aftermath of the Tunisian revolution, bearing in mind that the IMF forecasts are often overly optimistic.[13] We will include the

[13] The optimistic bias is actually recognised by the IMF itself on p. 9 of the 2003 "Sustainability Assessments—Review of Application and Methodological

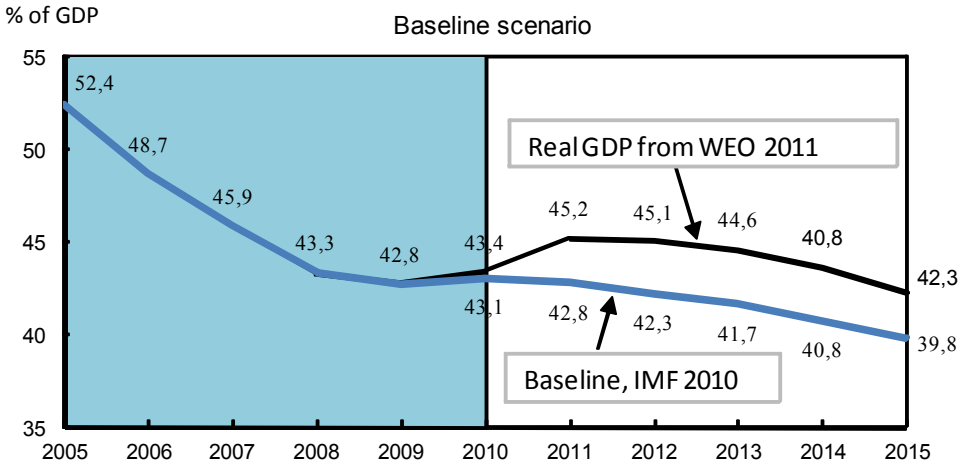
main determinants of the debt level one after the other to underline the impact of the change in each determinant, in a way such that each change in an additional determinant includes the changes already implemented in the other determinants.

The first update concerns the real GDP growth, considered one of the most important indicators in the debt analysis. It will allow us to calculate the nominal GDP, from which we calculate our debt-to-GDP ratio, as well as all other macroeconomic indicators expressed as a percentage of GDP.

The IMF 2010 Article IV Consultation Report published before the revolution predicted a growth rate of 4.8% in 2011, and 5%, 5.6%, 5.7% and 5.8% respectively in the following four years.

Based on the available information on the Tunisian economy published by the WEO 2011, Tunisia had no growth in 2011 (0%), as a direct result of the revolution that erupted at the beginning of the year. Nevertheless, the WEO expectations for the following years seem highly optimistic, reaching 3.9% in 2012, and 5.2%, 5.7% and 6.5% in the following years.

Figure 4.3 Baseline and real GDP growth data for Tunisia from WEO 2011



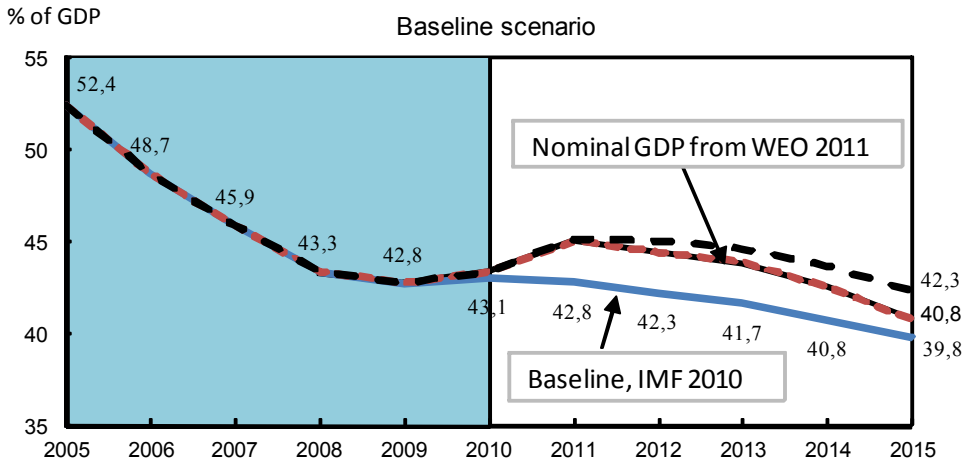
Source: Authors' own calculations.

Refinements", authorised for publication by Timothy Geithner, who was then Director of the IMF's Department of Policy Development and Review.

As can be seen in Figure 4.3, the debt-to-GDP level increases by 2.5 points from 39.8% to 42.3% in 2015. This illustrates clearly the strong impact of an economic slowdown on the debt sustainability and the need for all governments to pay particular attention to the impact of growth on debt.

The second determinant that we correct for is the GDP deflator. An increase in inflation leads to a decrease of the debt ratio, which decreases to 40.8%, as seen in Figure 4.4.

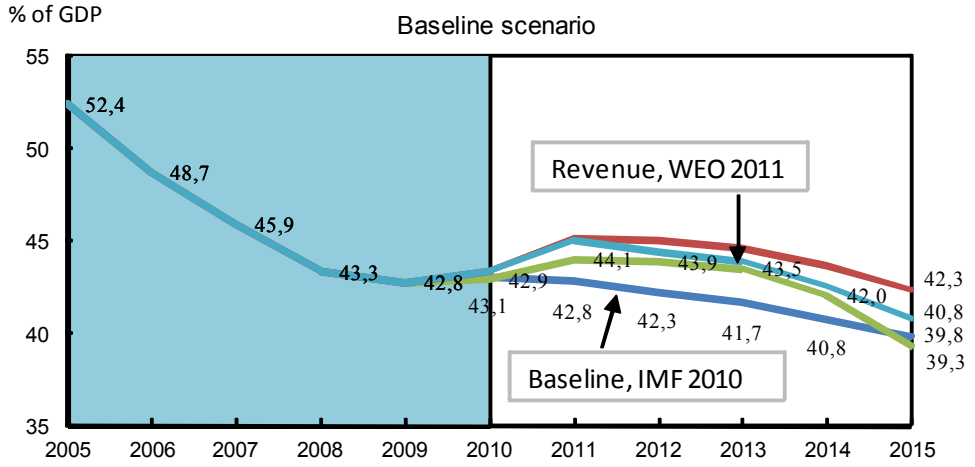
Figure 4.4 The impact of the new GDP deflator data for Tunisia from WEO 2011



Source: Authors' own calculations.

The next determinant is the central government's revenue. Surprisingly enough, the WEO 2011 data doesn't take into account the negative impact of the revolution on revenue. The forecasts are either similar or higher than those projected in the 2010 Article IV Consultation Report, leading to a decline in the debt level from 40.8% to 39.3% by the end of the period (see Figure 4.5).

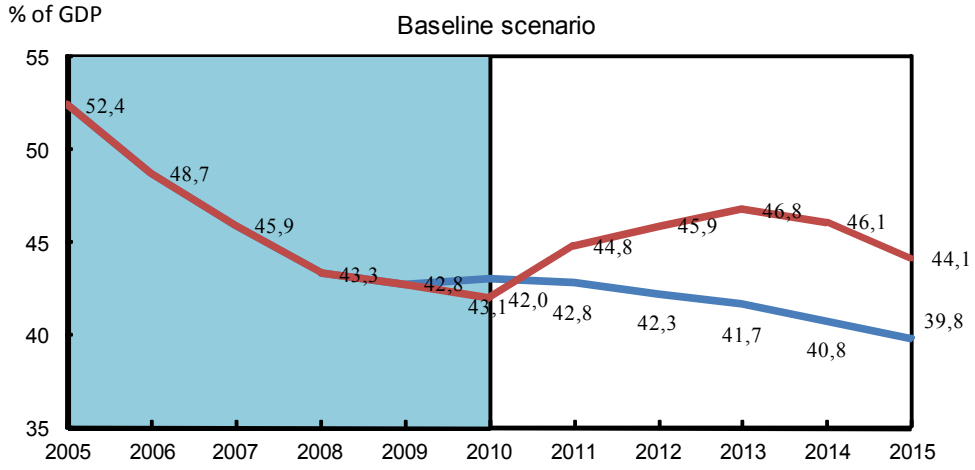
Figure 4.5 Revenue forecasted for Tunisia in data from WEO 2011



Source: Authors' own calculations.

When we add to the above the forecasted expenditures in WEO 2011, the outcome changes considerably. Indeed, the forecasted budget deficit and expenditures increase significantly, which reflects the expenditures related to the reconstruction and compensations related to the revolution (Figure 4.6).

Figure 4.6 Increase in expenditure projected for Tunisia in the WEO 2011



Source: Authors' own calculations.

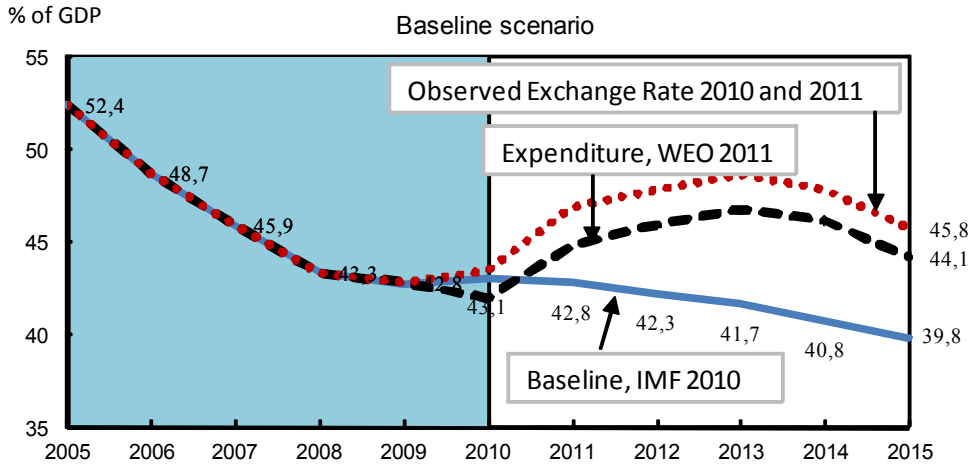
The data for public expenditures combined with the WEO figures for real GDP growth, GDP deflator, and revenue, cause the debt level to increase significantly, reaching 44.1% of GDP by 2015. This is another very important determinant of debt that governments will need to monitor, given its significant impact on debt sustainability.

The next indicator is the interest rate. Since we couldn't find the data in the WEO 2011, we decided to keep the same values that were used in the IMF 2010 Article IV consultation report. This can also be justified by the fact that no major changes occurred during this period in the interest rates neither domestic or foreign.

The last determinant is the exchange rate. The IMF 2010 baseline scenario is based on the assumption that the nominal exchange rate vis-à-vis the US dollar will be perfectly stable with no change. This is a very strong assumption for a country that historically adjusted its nominal effective exchange rate to target competitiveness.

Since exchange rate data are available for 2010 and 2011 (two years for which the IMF 2010 template records no exchange rate movement) we will use these values in our template (Figure 4.7).

Figure 4.7 Changes in Tunisia's exchange rate from IMF 2010



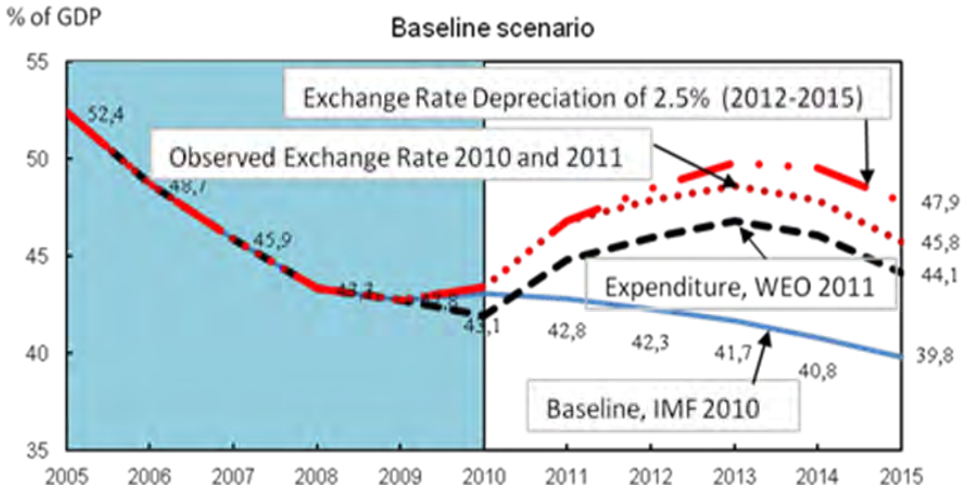
Note: Baseline adjusted by the observed exchange rate in 2010 and 2011.
Source: Authors' own calculations.

If we keep our focus on the IMF assumptions in the WEO 2011, we find nominal GDP both in local currency and in US dollars. This clearly indicates that the IMF has an assumption for the exchange rate

dinar/dollar, which was used to come up with the Tunisian GDP in US dollars. By dividing the two series, we can get the forecasted values of the exchange rate. The rate of depreciation is on average 2.5% between 2012 and 2015 (for the period 2007-11, the depreciation vis-à-vis the US dollar is 2% annually).

Therefore, in order to finalise our baseline using the WEO 2011 data, we will include an annual depreciation of the Tunisian dinar by 2.5% vis-à-vis the US dollar (Figure 4.8).

Figure 4.8 Annual exchange rate depreciation of 2.5% in Tunisia between 2012 and 2015



Source: Authors' own calculations.

Taking into account the WEO 2011 forecasts of the main determinants of debt, we can see that the final outcome is worrisome. The debt level increases from a forecasted 39.8% of GDP to 47.9% of GDP. These figures, yet alarming, represent the 'overly optimistic' assumptions of the IMF in the WEO publications. In the following section, we will present our own assumptions that we consider to be more realistic.

4.2.3 Assumptions for the realistic scenario

Moving from the baseline scenario that uses the WEO 2011 data, we will now build our own first scenario, which we qualify as realistic.

As previously discussed, there is evidence that the IMF forecasts are usually too optimistic and hardly met in reality. This is due to the

assumptions on which the IMF is building its forecasts. They are based on a specific 'set of recommendations' the IMF prescribes to the government, which, if implemented properly, will lead to the positive outcome predicted in the IMF forecasts. However, governments don't really follow the IMF's recommendations strictly, and the forecasts are hardly met. Therefore, we will have less optimistic assumptions in our 'realistic' scenario.

GDP growth

As we know, the Tunisian economy is highly dependent on the economic performance of its European partners, which don't seem to be firmly on the recovery path. Even if we consider that the very low 2011 growth can give way to high growth in the following year, we are still not convinced that Tunisia will achieve the very optimistic rates that the IMF predicts. The newly elected government never practiced economic management on a national level and will most probably need some time to learn and adapt before it becomes capable of implementing the right policies that would bring strong growth. We should also take into consideration the fact that tourism, even though recovering fast, needs essentially a stable and secure environment to prosper and get back to its previous levels in order to play its important role in enhancing growth.

Based on the above, we expect Tunisia to grow at a 2.5% rate in 2012, 3.5% in 2013, 4.5% in 2014, reaching 5.5% in 2015.

Figure 4.9 shows the impact on the debt level of our realistic assumptions about GDP growth, which increases by 2.4 percentage points by 2015, from 47.9% of GDP in our baseline scenario to 50.3% of GDP.

GDP deflator

The second variable required for the calculation of the GDP is the deflator. The deflator's inflation predicted in the WEO 2011 is a little higher than the one in the IMF 2010 report. This reflects some inflationary pressures building-up that we need to take into consideration. We decided therefore to use the same assumptions as in the WEO 2011, which were confirmed by a recent announcement of the Tunisian Central Bank Governor in *Jeune Afrique*, 27 December 2011.

Revenues, expenditures and deficits

The data we use in our template to calculate the budget deficit are composed of revenues (including grants) and expenditures. Historically, Tunisia's budget deficit was under control and didn't exceed 3% of GDP in the immediate years preceding the revolution. The IMF's 2010 report shows that the ratio of budget deficit to GDP including grants and privatisation receipts will range between 2.5% in 2012 and 2.1% in 2015. In WEO 2011, the deficit is expected to widen (taking into consideration the new GDP figures) to reach 5.5% of GDP in 2011, and the government is targeting a deficit of 6.5% of GDP for 2012.[14] For the following years, we expect the deficit to decline by 1% of GDP each year to reach 5.5% in 2013, 4.5% in 2014, and 3.5% in 2015.

On the revenue side, we expect less revenue for 2011 to match the announced budget deficit of 5.5%, with a growth rate of 6.4% instead of the 8.8% projected by the WEO 2011. Thereafter, we expect revenues to start growing at an annual rate of 13.5% in 2012 and 12% in 2013, to stabilise around 11% in 2014 and 2015. This will reflect two important aspects. The first is the determination of the population to sustain the country's economy after the revolution by paying taxes without evasion due to the surge of patriotic feelings. The second is that the Islamic government will toughen the anti-corruption and tax evasion laws that will help collect more tax revenue.

On the expenditures side, 2011 and 2012 are exceptional years where expenditures surged due to the need to finance some reconstructions and repair some damages that the revolution created. Some of the cost was covered in the 2011 budget but there are still significant expenditures planned in 2012. We expect expenditures to grow by 16.1% in 2011 (as per the data in the WEO 2011) and 16% in 2012 (as announced by the government), which matches the expected deficit (taking the revenue projections into account). In the following years, expenditures will grow at a normal pace, close to that recorded before the revolution (around 8% per year). These growth rates in expenditures are much higher than those forecast by the WEO 2011, at 5.9%, 7.3%, 6.4%, 7.8% respective for the years between 2012 and 2015.

[14] As announced by the Tunisian government in the Complementary Finance Law, in March 2012.

When simulating these assumptions, the debt level increases again from 50.3% to 52.6% of GDP (Figure 4.9). We are getting far away from the 39.8% level in the 2010 Article IV consultation report.

Interest rates

The increase in budget deficit requires financing, both domestic and foreign, which may drive borrowing interest rates up.

The domestic interest rates on government borrowing might increase due to crowding-out, if the government borrows massively domestically. On another front, inflationary pressures that we expect to build up will also contribute to an increase in interest rates.

Therefore, it seems realistic for us to predict an increase in the domestic interest rate in comparison to the one used in the baseline, by about 200 basis points in 2012 and 2013, and 100 basis points in 2014 before they resume their normal level in 2015.

Borrowing from the international market is not easy nowadays, as could be seen in the case of Greece (among other European countries). Many countries struggled in the past to raise funds on the international markets when they were facing economic turmoil. If the creditors perceive an increasing country risk, this will be automatically reflected in the premium they ask to lend money, and the interest rates Tunisia might have to pay can possibly increase, especially after the country was downgraded by the rating agencies in 2011.

Therefore, we expect the foreign interest rates to increase by about 200 basis points in 2012 and 2013, 100 basis points in 2014 and be back to their normal level in 2015.

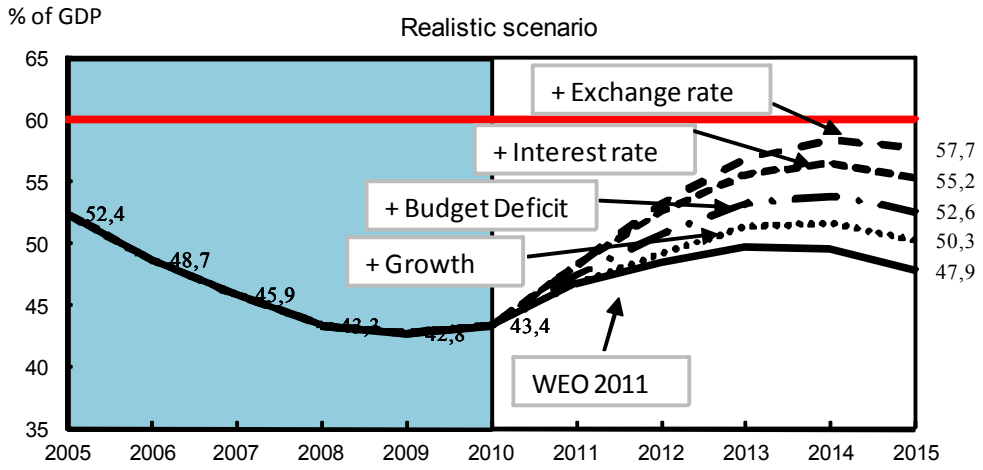
As seen in Figure 4.9, the debt level increases from 52.6% to 55.2% of GDP under these assumptions. This exercise can be repeated using other assumptions for interest rates in order to emphasise the sensitivity of debt levels to changes in interest rates.

Exchange rate

In our baseline, we used the WEO 2011 forecasts of 2.5% annual depreciation starting from 2013. Historically, Tunisia has always allowed its currency to depreciate by the same level as inflation, to compensate for any loss of competitiveness. We assume the new government will maintain the same policy. Keeping in mind that we project an increase in inflation in our realistic scenario, it would be appropriate to build our assumptions on

an exchange rate around an annual depreciation of 5% per year starting from 2013.

Figure 4.9 The realistic scenario for Tunisia



Source: Authors' own calculations.

As could be seen from Figure 4.9, the debt level significantly increases by 2015, reaching the alarming level of 57.7% of GDP in comparison with 47.9% of GDP in the same year using our baseline assumptions based on the WEO 2011.

4.2.4 Assumptions for the optimistic scenario

Some might find our realistic scenario too pessimistic to be reliable. Indeed, the Tunisian economic prospects might end up showing faster signs of recovery and stronger indicators. This is conditional on the government's success in establishing a stable and secure environment and well-functioning institutions capable of reassuring investors that the business climate is healthy and attractive.

In comparison with our benchmark presented in the realistic scenario, most of our indicators will witness some, yet pragmatic, improvement.

Our optimistic scenario is based on the assumption that the Tunisian real GDP will grow at 3.5% in 2012, 4.5% in 2013 and 6% in 2014, reaching 7.5% in 2015. The GDP deflator will remain the same as in the WEO 2011 (the same as in our realistic scenario), as we didn't see any particular reason to modify it.

The budget deficit in 2011 was 5.5% of GDP, as provided in the WEO 2011 and was confirmed by the government. In an optimistic scenario, we expect the government to perform better, and to limit the budget deficit to 4.5% of GDP in 2012. For the following year, we assume the deficit will decline by 1% of GDP to reach 3.5%, and stabilise at around 2.5% in 2014 and 2015.

In this case, we expect revenue to grow at a higher rate than the one assumed in the realistic scenario, for the same reasons presented above. One can't really tell the exact impact of the will of the population to sustain the country's economy after the revolution by paying their taxes without evasion due to the surge of patriotic feelings, or how the expected tougher anti-corruption and anti-tax evasion laws will help collect more tax revenue.

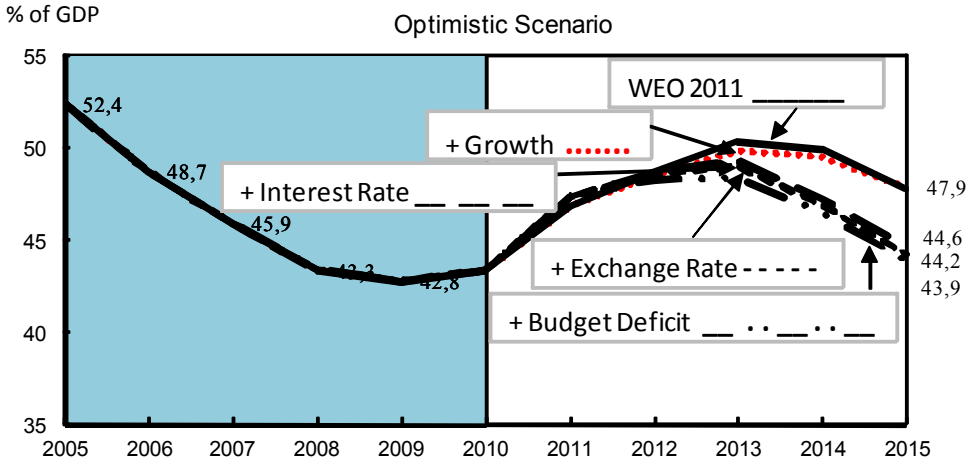
Therefore, our assumptions for revenue growth are slightly higher that the realistic scenario, projected to reach 16% in 2012, to stabilise around 11% in 2013 and 2014, and to go back to 9% in 2015.

In the same vein, we assume that expenditure growth will slightly decline, due to a lower-than-expected cost of reconstruction and compensation due to the revolution, but also due to a more conservative government policy that will resist the temptation to make large expenditure increases. Hence, we expect expenditures to grow by only 12% in 2012, and to return close to their pre-revolutionary growth level, at around 8% per year in the following years.

Given these optimistic assumptions, we expect less crowding-out pressures on domestic interest rates, and better perceptions on the part of foreign creditors of the country's economic prospects, which would also limit the increase in interest rates. Therefore, we use in our DSA template a minor increase in interest rates, both domestic and foreign, by 100 basis points in 2012 and 2013 only.

Finally, we believe that an optimistic scenario should reflect, among other factors, limited inflationary pressures. This assumption is in line with the limited increase in the interest rates and with the assumptions related to the GDP deflator. Given the fact that the Tunisian authorities have been successfully targeting competitiveness in the past 15-20 years, by allowing the exchange rate to depreciate by a percentage equivalent to the inflation differential vis-à-vis the main trading partners, we consequently assume a 2% annual depreciation.

Figure 4.10 Optimistic scenario for Tunisia



Source: Authors' own calculations.

In comparison with the WEO 2011 baseline scenario, we can see a limited impact on the debt level in 2015 of our assumptions of real GDP growth. The optimistic assumptions for the budget revenue and expenditures will lead to a significant decline in the debt level forecasts for 2015, which decrease from 47.9% to 43.9% of GDP. Of course, the expected increase in interest rates will drive the debt level slightly higher to 44.6% of GDP, but the assumption of a lower rate of depreciation will contain this increase to establish the debt level at around 44.2% of GDP by 2015 (Figure 4.10).

These results are still higher than those contained in the 2010 IMF report, but are much lower than our realistic scenario, which forecasts a debt-to-GDP ratio at 57.7%. The fact that the difference in the outlook of the two scenarios is so large (13.5% of GDP) is another indicator of the necessity to perform our exercise with even more scenarios and using alternative assumptions to present all possible evolutions of the debt ratio.

4.2.5 Assumptions for the pessimistic scenario

As presented in section 4.1, it is very important to try to come up with a coherent 'worst case' scenario. In this simulation, we will assume that the political transition is not taking place smoothly, which negatively affects the business climate. Investments will decline, both foreign and domestic, and consumption will also decline as savings increase in times of uncertainty. We therefore expect a sharp and extended decline in GDP

growth, to reach 1% in 2012 and 2013, and a mild increase to 2% in 2014, reaching 3% in 2015.

One can be tempted to see increasing inflation as another pessimistic indicator in an economy's outlook. Nevertheless, the GDP deflator is more linked to the demand of producers than consumers, and therefore can be in line with the expected evolution of the real GDP. Given our pessimistic scenario for real GDP growth, we see limited room for inflationary pressure on the GDP deflator. Therefore, we decided to use the same assumptions as in the WEO 2011.

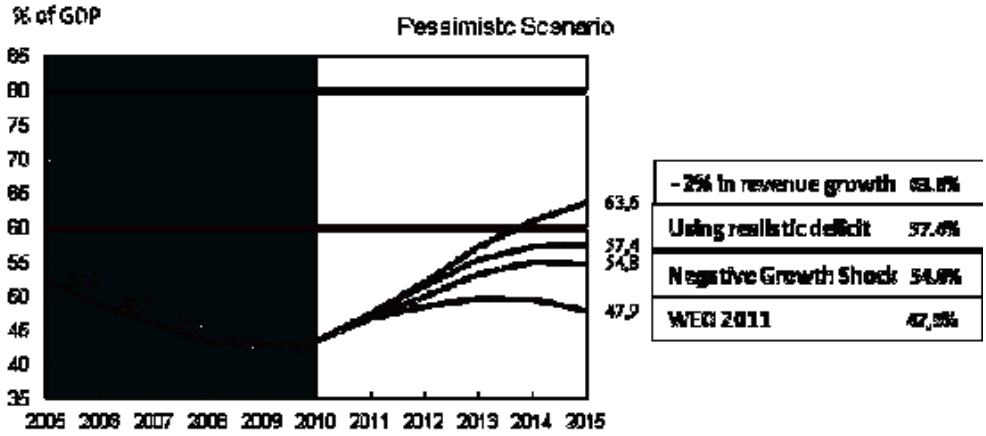
As can be seen in Figure 4.11, the debt-to-GDP ratio reaches 54.8% in 2015, compared to 47.9% in the WEO 2011 baseline scenario and 50.3% and 47.8% in the realistic and optimistic scenarios, respectively.

On the budget side, because GDP is lower than what we would observe in our realistic and baseline scenarios (because of lower real GDP growth), the ratio of the budget deficit-to-GDP will automatically increase, if we keep the revenues and expenditures at their levels forecast by the IMF WEO 2011. In this case, the budget deficit given the pessimistic real GDP growth will reach 6.7% in 2012, 5.7% in 2013, 4.9% in 2014 and 3.9% in 2015.

The first assumption we will implement is that the revenues and expenditures are not at the WEO 2011 levels but at our realistic scenario levels. In this case, the debt ratio increases from 54.8% to 57.4% by 2015 (Figure 4.11).

However, when we forecast the revenue perspectives with a pessimistic view, we might expect a lower growth of revenue receipts in comparison with the realistic scenario for two main reasons: on one hand, the government might fail to implement the necessary reforms for tax collection and might also have a more limited access to foreign grants. On another hand, the economic slowdown usually negatively affects the tax receipts, as companies' profits are squeezed and personal and VAT taxes usually decline. We decided to use 2% lower growth rates of revenue than those used in the realistic scenario, so the numbers become 11.5% in 2012, 9.8% in 2013 and 9% in 2014 and 2015.

Figure 4.11 Impact on debt of a pessimistic outlook for growth and budget revenues in Tunisia



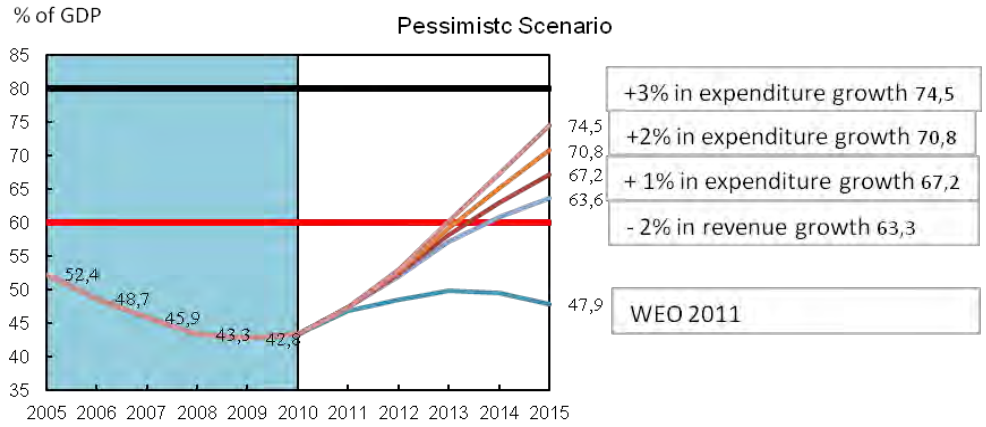
Source: Authors' own calculations.

In this case, and while keeping expenditures at their realistic scenario levels, the debt ratio increases again to reach 63.6% of GDP (Figure 4.11).

Expenditures are the main discretionary fiscal policy and the government might be tempted to increase expenditures as a stimulus to a slowing economy, and for the reconstruction of the impact of the revolution, for unemployment benefits, subsidies, employment in the government agencies and government investments in infrastructure projects in several cities that were neglected by the former government before the revolution. It has also been observed that some newly elected governments run larger-than-average fiscal expenditures in order to get re-elected (a phenomenon known as the 'political budget cycle'), which might also be the case here.

In order to simulate such behaviour, we will implement three different scenarios: a 1% increase in public expenditure growth compared to the growth of expenditures in our realistic scenario, a 2% increase and a 3% increase of the growth of expenditures. The impact on debt, *ceteris paribus,* compared to our latest assumptions on GDP and revenues, is an increase of the debt ratio reaching respectively 67.2%, 70.8% and 74.5% (Figure 4.12).

Figure 4.12 Impact on debt of a pessimistic outlook for budget expenditures in Tunisia



Source: Authors' own calculations.

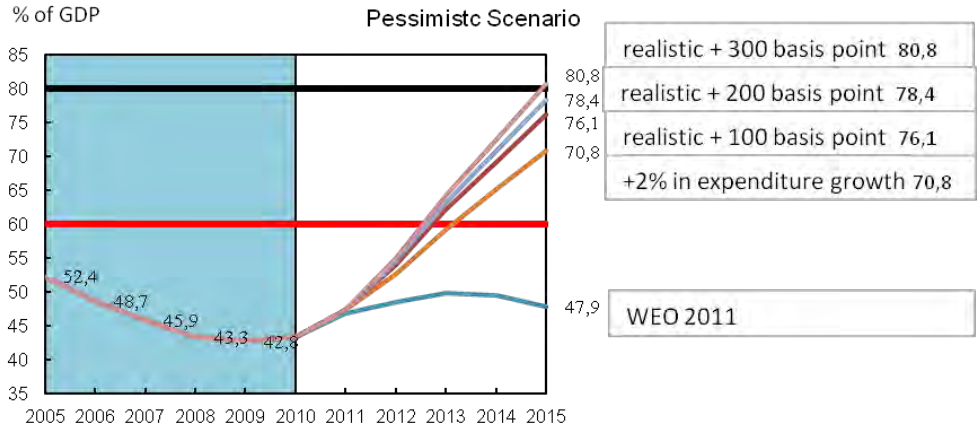
In the following steps of the pessimistic scenario, we will keep only the assumption of a 2% increase in expenditure growth, which reaches 18% in 2012 (compared to 16% in the realistic scenario). Between 2013 and 2015, the expenditures will grow by 10% per year, which is the average growth rate before the revolution. The debt level in 2015 is therefore 70.8% as seen above (Figure 4.12).

Interest rates are expected to increase in reaction to a larger budget deficit, which requires both internal and external financing, putting pressure on the interest rates. Should the government decide to finance part of the deficit from domestic banks, it will lead to crowding-out and will increase the interest rates. On the foreign side, an increase in the deficit is often perceived as a worrisome sign that increases the country risk and the premium on the borrowing rates.

In our pessimistic scenario, we decided to increase the interest rates by 100 basis points more than in the realistic scenario, which leads to an increase by 300 basis points in 2012 and 2013, and 200 basis points in 2014 and 2015. In reaction, the debt ratio increases from 70.8% to 76.1% (Figure 4.13).

We also simulated a sharper increase in interest rates, both domestic and foreign, by increasing them by 200 and 300 basis points compared to our realistic scenario, which lead to an increase in debt to 78.4% and 80.8% respectively (Figure 4.13).

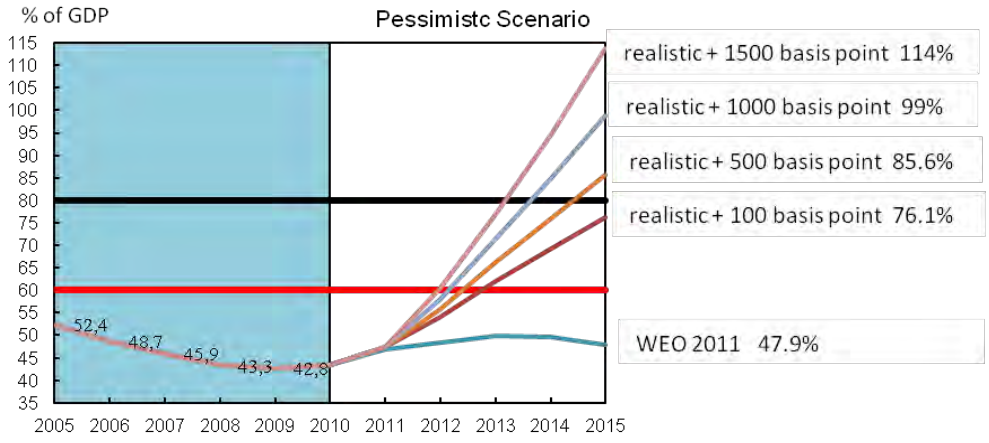
Figure 4.13 Impact of interest rate increase in Tunisia



Source: Authors' own calculations.

The assumption of an increase in interest rates by 500 basis points compared to those that prevailed before the revolution pushes the Tunisian debt level for the first time above the psychological threshold of 80% of GDP, which is more than double that forecast by the IMF 2010 Article IV consultation of 39.8%. It is worth highlighting that interest rates can easily increase by much more than the levels simulated here, reaching in some cases more than 20% (Greece recently), which might be a serious disaster for the Tunisian economy (Figure 4.14).

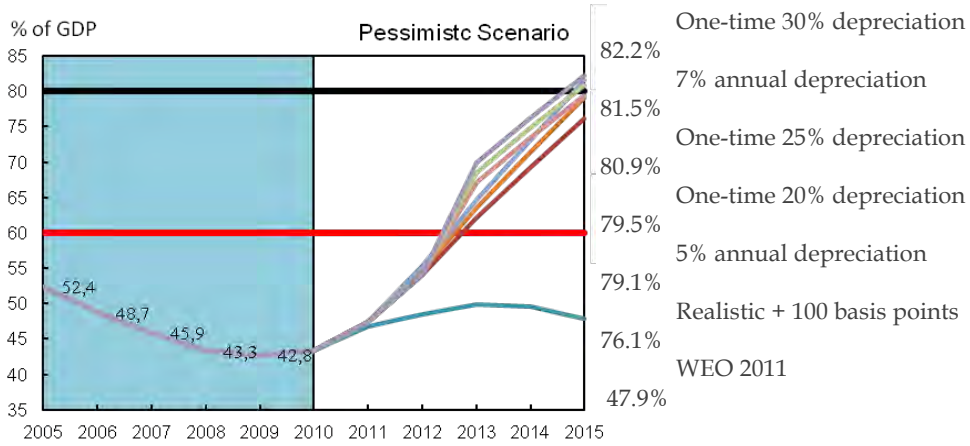
Figure 4.14 Sharp increase in interest rates in Tunisia



Source: Authors' own calculations.

The last determinant of the DSA is the exchange rate. In our baseline scenario (WEO 2011), we assumed an annual depreciation rate of 2.5%, which is the rate used from the beginning of our pessimistic scenario until now. When we apply the 5% depreciation per year that we used in our realistic scenario, the debt level jumps from 76.1% to 79.1% of GDP. If the depreciation increases to 7% annually, the debt level increases to 81.5% (Figure 4.15).

Figure 4.15 The impact of different levels of depreciation of the Tunisian dinar



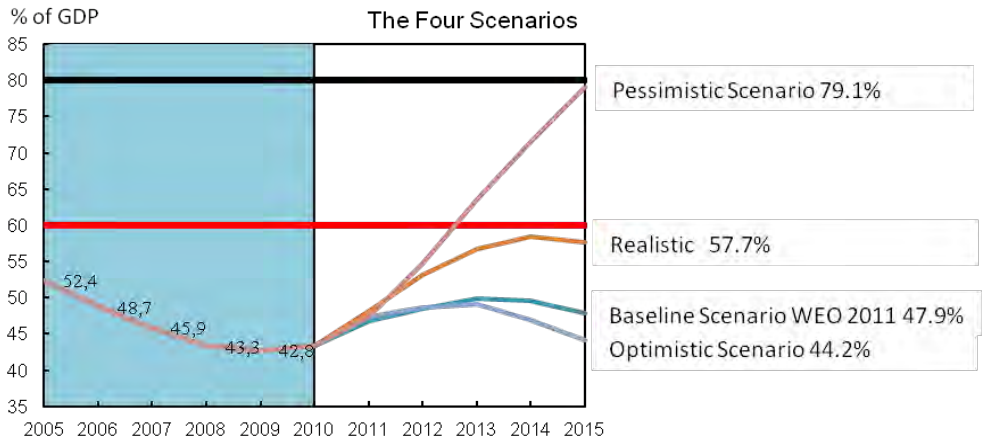
Source: Authors' own calculations.

In our view, the government shouldn't proceed with a devaluation of 7% annually, as this might trigger speculative attacks. Agents in the economy might be tempted to buy dollars as they are almost sure they will get a 7% annual return due to the depreciation, which might amplify the demand for dollars and lead to an even-larger depreciation. Therefore, we recommend that the government proceeds with a one-time large depreciation and maintains the exchange rate fixed thereafter. This will provide exports with a strong boost that will help generate a higher GDP growth (the J-curve theory), and will prevent any speculative attacks against the currency. We simulated three levels of devaluation – 20%, 25% and 30% – that takes place only in 2013, and the debt level reaches respectively 79.5%, 80.9% and 82.2% (diagrammed in Figure 4.15). It would be highly advisable to proceed with the devaluation of the Tunisian dinar when the world, and particularly Europe, is witnessing a confirmed recovery in order to maximise the benefits of the devaluation on the Tunisian economy.

4.2.6 *Conclusions for the Tunisian economy*

It is clear that the outlook for the debt sustainability in Tunisia is worrisome. The four scenarios we presented – the baseline scenario using the WEO 2011 data, our realistic, optimistic and pessimistic scenarios – all reflect some possibilities for the debt level to increase in the coming years (Figure 4.16).

Figure 4.16 Recap of the four scenarios for Tunisia



Source: Authors' own calculations.

According to our results, the most important factor that could make the debt level unsustainable is growth. Lower growth is automatically increasing the debt-to-GDP ratio, *ceteris paribus*.

In addition, with lower growth, public revenues decline, public expenditures increase, leading to a widening budget deficit and a higher debt level. The debt sustainability is exacerbated by an increase in interest rates due to crowding-out and due to the negative outlook perceived by foreign creditors, pushing the debt level even higher. Therefore, focusing on growth is essential for debt sustainability.

4.3 Debt sustainability analysis for Egypt

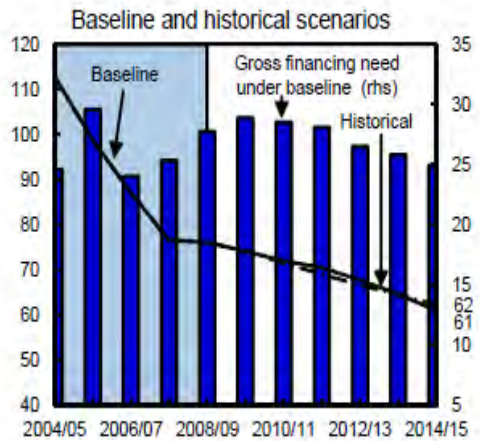
Just like for Tunisia, the IMF regularly publishes the debt sustainability assessment (DSA) for Egypt in its Article IV consultation report. Given the uncertainty and insecurity in the country, however, the latest such report dates back to 2010 and we use it as our benchmark. We will proceed in

exactly the same sequence as we did for the case of Tunisia, starting with the replication of the baseline available in the 2010 Article IV Report.

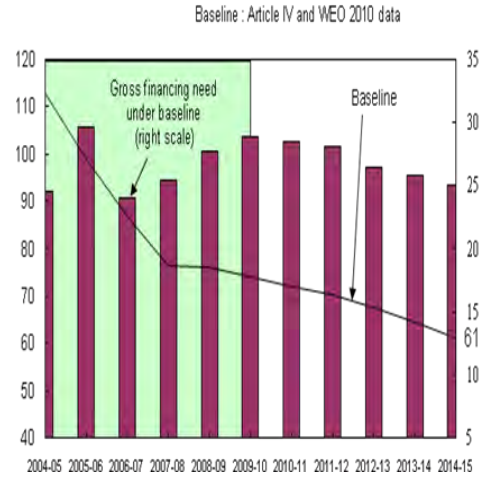
4.3.1 Replication of the IMF 2010 Article IV consultation's DSA

Figure 4.17 shows the outcome of our exercise reproducing the Public Sector Debt Sustainability Framework template and graphs as per the latest published Egypt Article IV consultation report, which is based on WEO 2010 data.

Figure 4.17 Baseline scenario for Egypt using the data from the IMF's 2010 Article IV report



Source: IMF Article IV consultation 2010.



Source: Authors' own calculations.

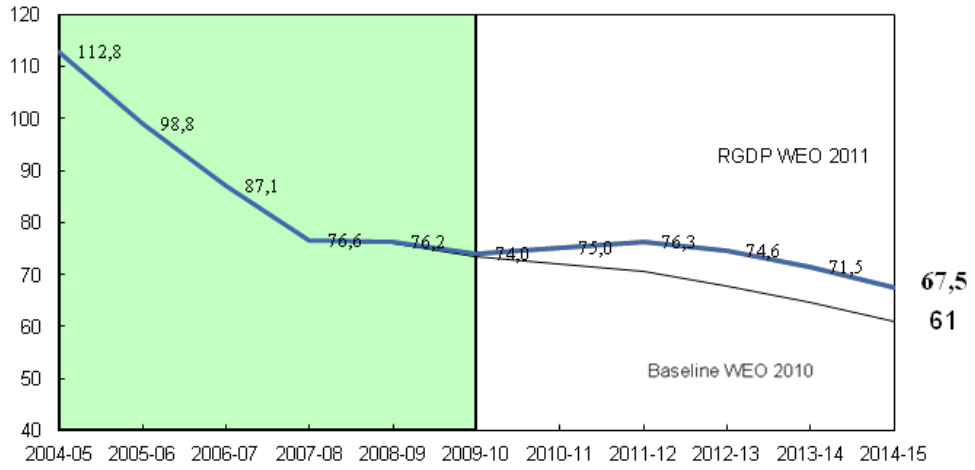
The debt-to-nominal GDP ratio ends up at 61% in 2015 as given in the IMF projections (Table I.1, p. 36 of the IMF report). In the case of Egypt, our calculations coincide perfectly with those of the IMF, so we don't need to present the detailed data table and we can directly proceed with the adjustments of our baseline with more recent IMF data for Egypt, published in the WEO 2011 and 2013,[15] respectively.

[15] Data available as of April 2013.

4.3.2 *Baseline using World Economic Outlook (WEO) 2011 and 2013 data*

In this section, we started modifying one debt sustainability determinant (input variable) at a time. First, we updated the real GDP time series with the data available in the WEO 2011 database, which demonstrated the very first adjustments of the data after the Arab spring. With the lower forecasts for the national output, the resulting debt/nominal GDP ratio increases to 67.5% in 2015, as shown in Figure 4.18, and this is already beyond the comfort zone of 60%.

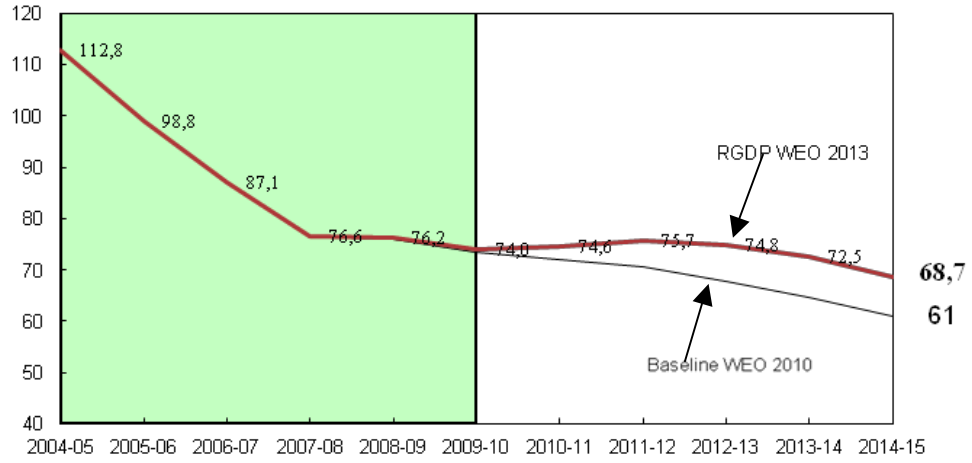
Figure 4.18 Baseline scenario for Egypt using the data from WEO 2010 and real GDP update from WEO 2011



Source: Authors' own calculations.

Using the latest published projections (WEO 2013) for real GDP only, the ratio rises further to 68.7% (thicker line in Figure 4.19).

Figure 4.19 Baseline scenario for Egypt using the data from WEO 2010 and real GDP update from WEO 2013

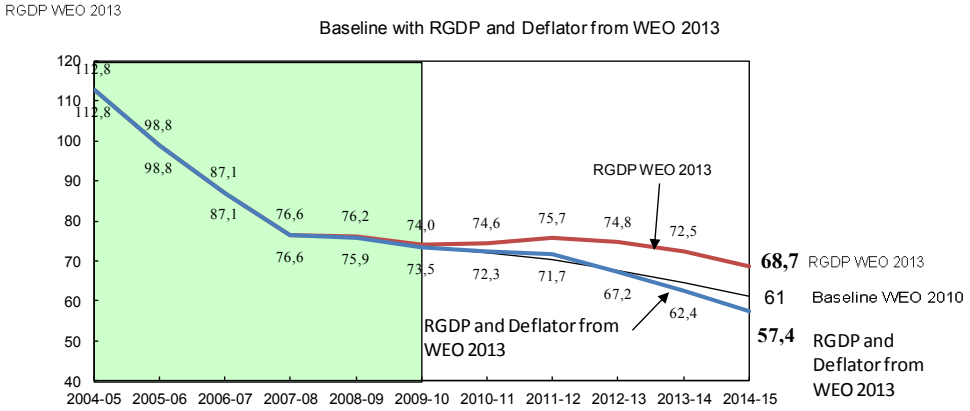


Source: Authors' own calculations.

If we are to use both the real GDP and the deflator data and forecasts from WEO 2013, the ratio in 2015 falls all the way down to 57.4% (blue line on Figure 4.20). However, the GDP deflator data are complicated to calculate and are often obtained by dividing the nominal GDP by the real GDP numbers, which by themselves are hard to calculate accurately and are subject to the IMF's judgmental approach. If we 'judgmentally' assume very high deflator numbers, this will generate a high nominal GDP, and thus a low debt-to-nominal-GDP ratio, which might represent a misleadingly reassuring indicator.

The reason why we opt to change these two variables first (real GDP and deflator) is in order to obtain the most recent nominal GDP variable, which is essential as most indicators we are working with are expressed as ratios out of nominal GDP.

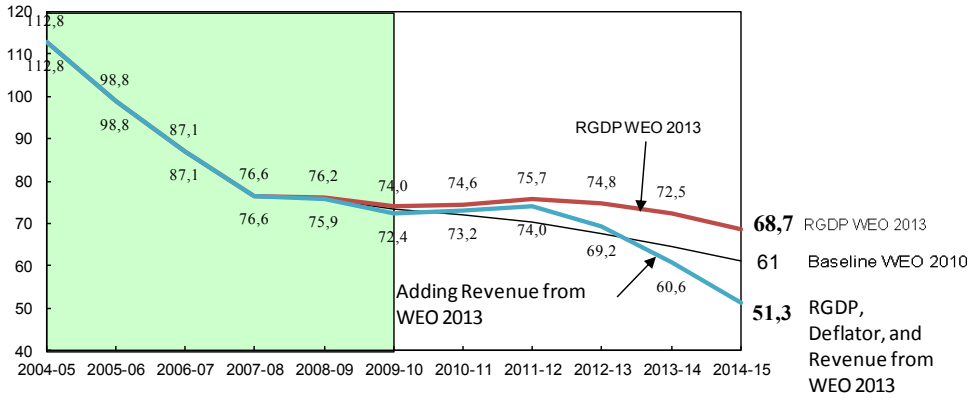
Figure 4.20 Baseline scenario for Egypt using the real GDP and deflator updates from WEO 2013



Source: Authors' own calculations.

Next, we add to the updates the information about the budget revenue and grants, which depend on GDP growth. If we expect lower economic growth, we can expect lower sales, lower profits and therefore lower tax revenue (all forecasts of budget revenue by the IMF are based on the assumptions on revenue/GDP ratio, where GDP matters a great deal). Using WEO 2013 revenue data and forecasts, the debt-to-GDP ratio falls to 51.3% in 2015 (see Figure 4.21).

Figure 4.21 Baseline scenario for Egypt using the real GDP, deflator and revenue updates from WEO 2013

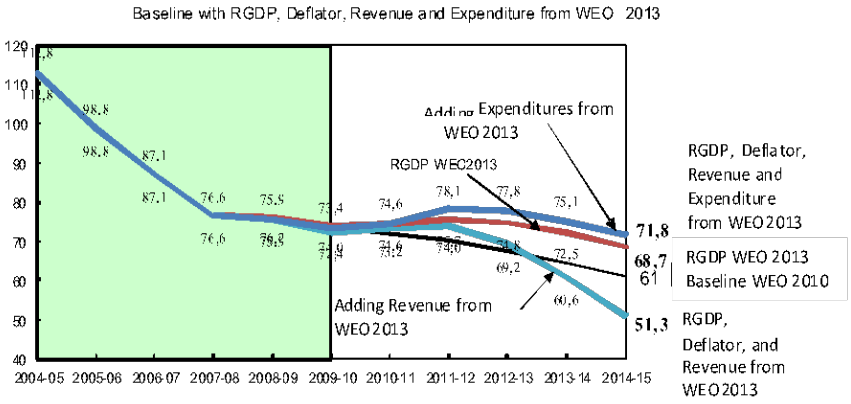


Source: Authors' own calculations.

Nevertheless, we have to keep in mind that the average projected revenue growth rate in WEO 2013 from 2012 onwards is 19.7% annually, which sounds too optimistic compared to the average growth rate of 11.5% projected in WEO 2010, and also compared to what Egypt had achieved before the revolution, which was an average of 15.7%.

The fourth update concerns the general government's total expenditures and is presented on Figure 4.22. Using WEO 2013 data, we obtain a debt/GDP ratio of 71.8% in 2015.

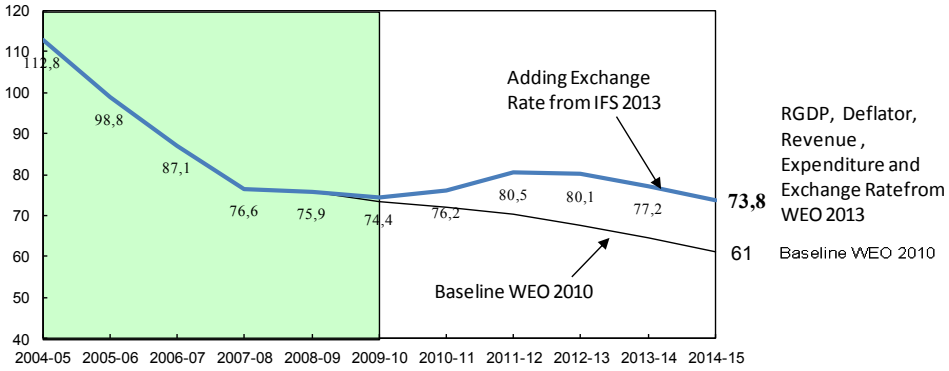
Figure 4.22 Baseline scenario for Egypt using the real GDP, deflator, revenue and expenditure updates from WEO 2013



Source: Authors' own calculations.

Next, we updated the information regarding the exchange rate. We used the actual IFS 2013 data until 2012, when the exchange rate was 6.3 Egyptian pounds for one dollar (end of period), and we kept it constant at this level until 2015, since the WEO's general assumption is to keep the exchange rate constant for future periods. With that, the debt-to-GDP ratio rose to 73.8%, as seen in Figure 4.23.

Figure 4.23 Baseline with real GDP, deflator, revenue, expenditure and exchange rate in Egypt from WEO 2013



Source: Authors' own calculations.

Finally, we kept the forecasts for the debt interest rates and the government's interest payment expenditures unchanged as per WEO 2010. We could find updated numbers for 2010-12 published by Egypt's Ministry of Finance, but we couldn't find any forecasts until 2015, so the series would have been inconsistent if we had only changed several observations in the middle of it.

Thus, our 'baseline WEO 2013' scenario corresponds to Figure 4.23, in which the debt-to-GDP ratio increases steadily in the future until it reaches 73.8% in 2015. Now we can proceed with our realistic, optimistic and pessimistic scenarios.

4.3.3 Assumptions for the realistic scenario

Under this scenario, we try to identify the most probable future situation, given the constraints of the current economic and political environment.

Real GDP growth rate assumptions

The lingering insecurity and political instability remaining in Egypt in 2013 are not at all promising in terms of returning tourism flows or growing economic activity, so during the year we expect that the economy will perform only as well as it did in 2012 (i.e. a growth rate of 1.96% versus the projected 3.03% in WEO 2013). Next, we project slow recovery and add an extra 1% of GDP growth each year – 3% for 2014 and 4% for 2015. With this first assumption and all other variables kept at their 'baseline WEO 2013' levels, the debt-to-GDP ratio reaches 77.1%.

GDP deflator assumptions

We believe that the WEO 2013 data are acceptable as realistic, especially taking into consideration the recent depreciation of the Egyptian pound, which might put upward pressures on deflator inflation.

Government revenues assumptions

First, we expressed the revenues as a percentage of GDP. Next, we adjusted the forecasts by assuming that 2013 will be identical to 2012 and that revenues will start picking up slowly afterwards to reach 23.5% of GDP in 2014 and 25% in 2015 – the same level it had in 2010 before the revolution. Accordingly, the debt-to-GDP ratio keeps on rising to 83.2%.

Government total expenditures assumptions

Given the strong social tensions, numerous strikes and active social justice claims, we believe the government will find it very hard to cut expenditures drastically. Thus, since expenditures rose by 10.1% in 2011 and by 17.3% in 2012, we expect them to grow at a slower pace of 15.7% in 2013 (the average growth between 2003 and 2010), slowing even further to 14.7% in 2014 and 13.7% in 2015. The budget deficit in this case will climb to 11.5% of GDP in 2013, and will then decline to 10.6% in 2014 and further to 9.2% in 2015. The effect on the debt-to-GDP ratio is a further increase to 84.9% in 2015.

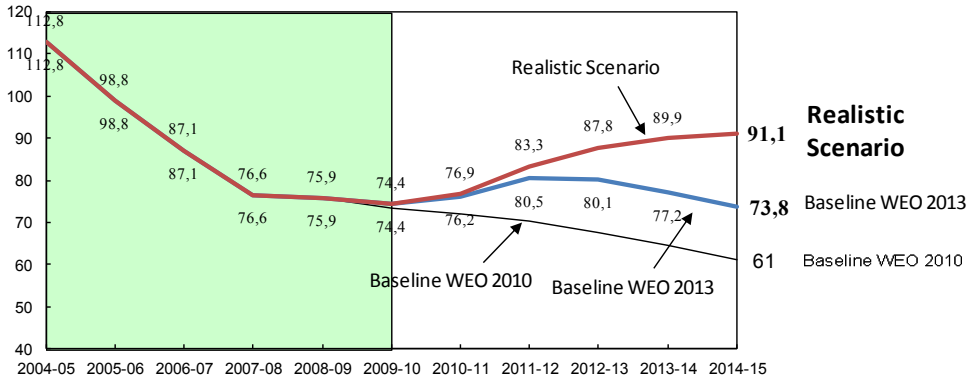
Interest rate assumptions

We replicated the evolution of interest rates on Treasuries between 2010 and 2013, and then assumed rates will remain constant until 2015. The debt-to-GDP ratio continues rising to reach 89.5% in 2015.

Exchange rate assumptions

The exchange rate has been under serious pressure since the revolution and the depletion of the official reserves, pushing the central bank to allow the Egyptian pound to depreciate continuously – reaching 6.85 pounds per dollar on 10 April 2013 (the black market has a much higher rate that we will consider in the pessimistic scenario). Our final realistic scenario forecast for the debt-to-GDP ratio is 91.1% in 2015, as presented in Figure 4.24.

Figure 4.24 Egypt's realistic scenario



Source: Authors' own calculations.

4.3.4 Assumptions for the optimistic scenario

We start this simulation using the realistic scenario (presented in Figure 4.24 above) as 'initial input' for our template and graphs.

Real GDP growth rate assumptions. Should the economic situation stabilise promptly, the political situation clarifies and peaceful parliamentary elections create a stable government, this will improve the country's attractiveness and generate growth. Thus, our projections are for growth of 2.5% in 2013, 3.5% in 2014 and 5% in 2015. The debt-to-GDP ratio improves to 88.5% in 2015 instead of 91.1% in the realistic scenario.

GDP deflator assumptions. Although higher growth could have implied slightly higher inflation, we believe that the current under-utilisation of economic resources will control the inflationary pressures, so we keep the data equivalent to that in the baseline and the realistic scenario, leaving the debt ratio unchanged at 88.5% at the end of the period.

Government revenue assumptions. If we assume that the government will be able to improve tax collection and toughen tax evasion laws, we could expect budget revenues equal to 23% of GDP in 2013, 24.5% in 2014 and 26% in 2105. This will further improve the debt-to-GDP ratio to 86% by 2015.

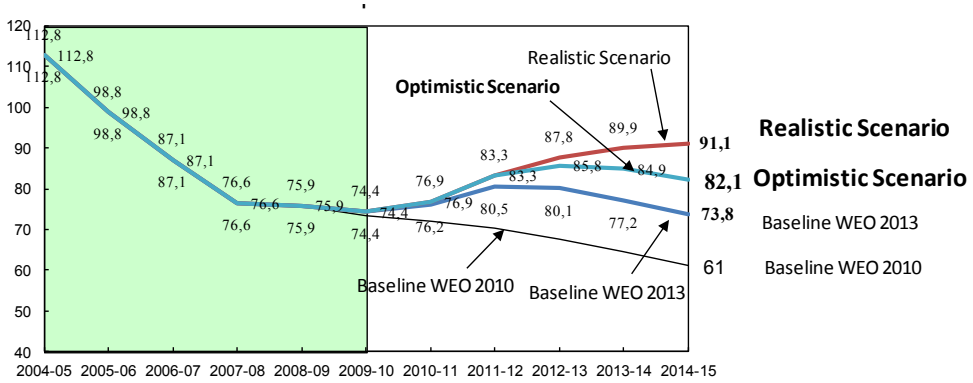
Government total expenditures assumptions. If the government is able to successfully tackle the issues with the food and energy subsidies, if it can limit waste and rationalise and optimise fiscal spending, we expect expenditures to grow at a slower pace of 14% in 2013, slowing even further to 13% in 2014 and 12% in 2015. As a percentage of GDP, these expenditures will amount to respectively 33.3% in 2013 (down from 33.6%

in 2012), 32.8% in 2014 and 32.1% in 2015. This would reduce the budget deficit from 10.3% in 2013, to 8.3% in 2014 and to 6.1% in 2015. Finally, the debt-to-GDP ratio will thus fall to 83.1% by the end of the forecast period.

Interest rate assumptions. Due to an improved security climate, we can expect the cost of borrowing to be one percentage point lower in 2013 and remain stable over the forecast period, resulting in a debt-to-GDP ratio of 82.1% by 2015.

Exchange rate assumptions. We have no reason to believe that the exchange rate will appreciate in the coming three years, so we shall keep the data the same as in the realistic scenario.

Figure 4.25 Egypt's optimistic scenario



Source: Authors' own calculations.

Thus, the final debt-to-GDP ratio **optimistic forecast** presented in Figure 4.25 is for **82.1% by 2015**, which is still higher than the WEO 2013 baseline projection of 73.8%, confirming our intuition that the IMF forecasts are overly optimistic.

4.3.5 Assumptions for the pessimistic scenario

Coming back to the realistic scenario (Figure 4.24) as 'initial conditions' for our last simulation, we first adjust lower our real GDP growth rate assumptions to keep growth at 1.8% in 2013, 2% in 2014, allowing it only to pick up to 3% in 2015. Compared to our realistic scenario, this increases the debt-to-GDP ratio by more than 2.5 points to 93.8%.

GDP deflator assumptions. Even if the lower GDP growth would cause lower pressure on factors of production, this downward pressure on prices will be offset by the assumption that the exchange rate will further

depreciate during 2013-14. Thus, we shall again keep the realistic scenario data, which reproduced the WEO 2013.

Government revenues assumptions. Revenues will grow at a slower pace than in the realistic scenario at 13.5% annually (the average growth rate for the 2002-10 period; equivalent to the 2012 growth rate). This results in revenues as a share of GDP of respectively 22.3%, 22.4% and 22.6% for 2013-15, which corresponds to the projected GDP growth rates and is a fair assumption. The value of debt approaches dangerously the value of national output with 97.4% by 2015.

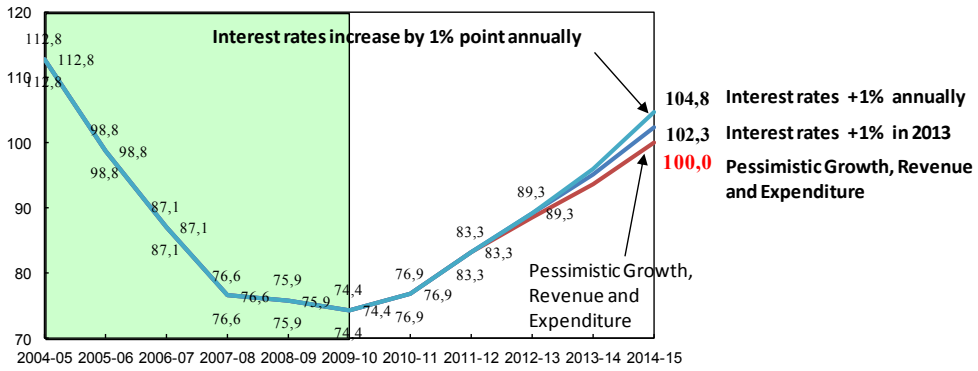
Government total expenditures assumptions. Because of even stronger claims for more social justice, salary adjustments, infrastructure projects, etc., the government might be unable to keep its expenditures under control given the imminent threat of social unrest. Thus, for 2013 we project the same growth rate as 2012 of 17.3% (resulting in an expenditures-to-GDP ratio of 34.5%). For 2014 and 2015, we input the same growth rate as the average between 2002 and 2010 of 15.7%, giving a ratio growth-to-GDP of 35.4% and 36.4% respectively. Accordingly, the budget deficit will reach 12.2% in 2013, 12.9% in 2014, and 13.7% in 2015. The debt will reach the dangerous threshold of 100% in 2015.

Interest rate assumptions. The higher budget deficit will lead to private investment crowding out and upward pressure on interest rates. We will look at three sub-scenarios as a sensitivity test:

- Interest rates are 1% point (100 basis points) higher in 2013 and constant in 2014 and 2015; this gives us a debt-to-GDP ratio of 102.3% in 2015.
- Interest rates are 1% point higher in 2013 and additional 1% point higher in 2014, stabilising in 2015; debt-to-GDP is at 104% in 2015.
- Interest rates are 1% point higher in 2013, an additional 1% point higher in 2014 and an additional 1% point higher in 2015 = 104.8% in 2015.

The first and third scenarios are presented in Figure 4.26.

Figure 4.26 Egypt's pessimistic scenario – Interest rate simulations

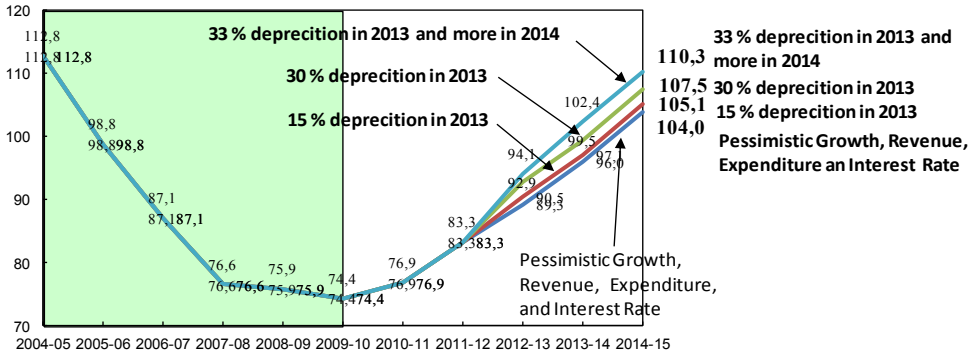


Source: Authors' own calculations.

Exchange rate assumptions. Keeping the intermediary interest rate scenario 2 (104% debt-to-GDP ratio), we decide to explore again three alternatives (from the least to the most pessimistic):

- The exchange rate will first depreciate by 20% by the end of 2013 as compared to the 2011 level to reach 7.25 pounds per dollar and remain stable at this level in 2014 and 2015. Debt reaches 105.1% of GDP in 2015.
- The actual level of the exchange rate catches up with the rate on the black market, which in the first week of April 2013 is 8 pounds per dollar. It remains at this level for the three projection years. Debt climbs further to 107.5% of GDP.
- Speculation and more pressure cause the exchange rate to depreciate even further than the current black market rate to reach 8.4 pounds per dollar in 2013, and 9 pounds per dollar in 2014 and 2015. The debt-to-GDP ratio explodes at 110.3% in 2015.

Figure 4.27 Egypt's pessimistic scenario – Exchange rate simulations



Source: Authors' own calculations.

No matter which of the three exchange rate sub-scenarios we might choose, the pessimistic outcome for the Egyptian debt-to-GDP ratio indicates it will go above 105% only two and a half years from the time of writing (see Figure 4.27).

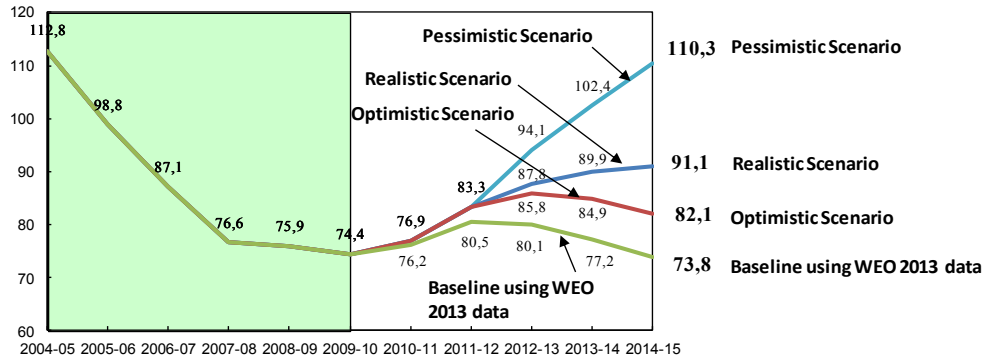
4.3.6 Conclusions for the Egyptian economy

After carefully analysing all stress tests for the Egyptian debt sustainability framework, we can conclude that the situation in Egypt is significantly more worrisome that of Tunisia.

Even in the worst-case scenarios, Tunisia's debt-to-GDP ratio reaches only the 80% threshold, which is alarming but still much more manageable than the ratios that the Egyptian authorities will have to handle. Figure 4.28 clearly shows that Egypt's debt goes beyond that threshold even in the most-optimistic scenario, going way above those 80% in any other circumstance.

However, our analysis also clearly shows that each scenario for both countries, even the most optimistic ones, still looks quite pessimistic compared to the latest available IMF forecasts. This is an important policy lesson for the two countries' authorities, requiring their particular attention. Unless they understand clearly the possible threats, the sources of these threats and the need to properly manage the respective macroeconomic variables at the origin of the threats, the debt-to-GDP ratio can go way beyond control in a little over two years.

Figure 4.28 Summary of the four scenarios for Egypt



Source: Authors' own calculations.

4.4 Conclusions and Policy Implications

The research reveals several vulnerabilities of the Tunisian and Egyptian economies that clearly undermine their debt sustainability.

It is evident that both governments should be extremely careful with the evolution of their country's debt, especially since the world, mostly the advanced part of it, is suffering from debt crises, and since financing deficits and refinancing debt is becoming more and more difficult and costly.

One important conclusion we can draw from our different scenarios is that political instability has significant implications for debt sustainability. Political stability is crucial for investments – both domestic and foreign – in Egypt and Tunisia, as investors seek a predictable business environment (Kamar & Bakardzhieva, 2002). With political uncertainty, investments will decline, remain low and will take time to pick-up. This means lower production (lower GDP), which might also translate into higher unemployment (as the population and the labour force increase every year). Lower production also means lower profit for investors and lower income for workers, leading to lower revenues for the government. This is the first major concern we urge the governments in Tunisia and Egypt to pay attention to. As we have seen from their budgets, tax revenues are forecasted based on highly optimistic assumptions that do not really take into account the possibility of a lower level of private investment and therefore a lower level of tax revenue. The direct implication of such an optimistic assumption is an increase in the budget deficit and in the debt ratio, beyond the level the government expected. Therefore, we strongly recommend to the governments in Tunisia and Egypt that they adopt a

pessimistic approach to forecasting revenue to be on the safe side and that they make their expenditure plans based on careful revenue assumptions.

Another implication of the political instability is the loss of trust from the international community in the ongoing political transition. This can lead to downgrades of the countries' credit ratings and an increase of their interest rates for borrowing on the international markets. The case of Greece is a fresh example with borrowing rates jumping to 28% when the markets lost confidence, despite the strong commitment of the European Union and the eurozone to stand by the country. This can also make it much more difficult for the government to finance its deficit or to refinance its existing debt, putting further pressure on debt sustainability.

A second important conclusion is related to expenditures. Indeed the revolutions claimed more social justice and more employment opportunities, but increasing current expenditures would be one big mistake. Any government that is freshly elected or seeks re-election or more power would be tempted to satisfy the public by increasing wages and public-sector employment. Such actions will create a heavy weight to carry for years to come. The situation in Tunisia is much better than in Egypt, where the deficit and the debt ratio are already very high, but the implications on debt sustainability are the same. Therefore, we strongly advise the governments to avoid any unnecessary current expenditures (in the economic, not the political or social sense), and to try to minimise and rationalise all areas of spending, e.g. subsidies and purchases of goods and services. If any kind of public expenditure is required to stimulate growth, it should be oriented mainly towards capital expenditure (government investment), particularly in infrastructure projects that could yield a significant impact on growth, and preferably oriented towards "Public-Private Partnership" projects, which could also stimulate domestic private investments.

Finally, it is clear that the exchange rate could be an issue for debt sustainability. On the one hand, maintaining a fixed exchange rate at an overvalued level is harmful for the whole economy and is obviously unsustainable. On the other hand, the devaluation of the currency can lead to serious implications for debt sustainability. Tunisia is again in a much healthier position than Egypt. The sharp decline in the official reserves in Egypt, combined with an appreciation of the real effective exchange rate over the past ten years, reflect the urgent need for an exchange rate correction. The recent depreciation is a step in the right direction, but the continuous interventions from the Central Bank are both irrational and harmful. The Gulf countries' deposits in the Central Bank are absorbed by the market right away, leading to the need for more borrowing. The

mismanagement of the exchange rate in Egypt is only leading to higher debt without any stabilisation of the market. Therefore, and in the absence of alternatives, the government should authorise the Central Bank to allow the exchange rate to float and depreciate. This will increase the debt ratio, indeed, but it will avoid accumulating more and more foreign debt, and ultimately the need to devalue the pound, and incur an even higher debt.

Finally, which scenarios seem the most plausible given the most recent data and events in both countries?

Tunisia. When we implemented our assumptions for Tunisia, final data for 2012 were not yet published, so we used 2011 data and we implemented our own assumptions for 2012 and thereafter. Now that we have the most recent data published in 2013, we can make a comparison with our assumptions to see in which direction the debt is heading. In order to clarify our comparison, we summarised our assumptions, the IMF's baseline and the most recent data in Table 4.2 below.

Table 4.2 Summary of the assumptions and results for the different scenarios for Tunisia, 2012

	Real GDP Growth	**Fiscal revenue % growth**	**Fiscal expenditure % growth**	**Interest rate**	**Exchange rate**	**Debt to GDP**
Baseline	3.9%	8.8%	5.9%	0	-2.5%	47.9%
Realistic	2.5%	13.5%	16%	+200	-5%	53.2%
Optimistic	3.5%	16%	12%	+100	-2%	48.6%
Pessimistic	1%	11.5%	18%	+300	-7%	55.3%
IMF 2013	3.6%	6.6%	12.3%	0	-10%	44.0%

When comparing the numbers published in 2013 for the indicators we used in our different scenarios, we can see that real GDP growth in 2012 is 3.6%, which is lower than the IMF's previous forecasts of 3.9%, but very close to our realistic forecast of 3.5%. Fiscal revenue's growth is lower than the IMF's forecasts and also much lower than our three scenarios, where the pessimistic forecasts we used were 11.5%. Growth in expenditures is much higher than the IMF's forecasts of 5.9%, reaching 12.3%, which is very close to our optimistic scenario of 12%. Interest rates on public debt seem not to have changed, leading to a better outcome than our three scenarios, while the exchange rate depreciated by 10%, which is much

worse than our three scenarios, but closer to some of our pessimistic scenarios.

Overall, the IMF publication of public debt dynamics shows a stagnation of the debt-to-GDP ratio at 44%, which is an improvement compared to their previous estimations for 2012 at 47.9%, which is puzzling. In analysing the assumptions, we find that we arrive at a lower GDP growth than previously expected, a lower growth of revenue, a higher growth of expenditures and higher exchange rate depreciation. Each of these facts alone leads to a higher debt-to-GDP ratio, and combined, they should lead to a noticeable increase in the debt-to-GDP ratio. A closer look into the assumptions shows that the IMF incorporated a residual corrective number of 3.5% to offset the impact of all those variables on debt, which is why the debt remains constant, and no explanation for this correction is given. In our scenarios, we set this residual item to 0% to avoid any manipulation of the results, as nothing can make us predict what would be a residual in the future.

Therefore, if we decide to exclude the residual figures, the debt-to-GDP ratio would be 44% + 3.5% = 47.5%. This result is very close to our optimistic scenario, reflecting the fact that overall the Tunisian economy is doing well and has a strong potential of a fast recovery. Taking into account the dependency of the Tunisian economy on the European economy, and given the very low current growth of its main partners (France and Italy), the outlook for Tunisia is very positive in our view, as it would certainly benefit from a future recovery in the EU, which will contribute to strengthening most of the Tunisian economic indicators and significantly improving its debt levels.

Egypt. The analysis of the case of Egypt is different as we used the 2012 final data published in 2013, so we implemented our assumptions only from 2013 onward. However, what we have to focus on is the recent "Revolution 2", which took place on 30 June 2013, when the former elected President Mohamed Morsi was overthrown by street protests supported by the army.

Beyond the ongoing debate on whether this major political event was justified or not, we will try to set aside any personal judgment and look at the potential implications for the debt dynamics in the coming years. Clearly, Egypt is today at a crossroad and we can't tell which scenario is more plausible.

Without a doubt, the economic situation in Egypt worsened in 2012, on both the fiscal and monetary level. In our view, this is due to the political instability and insecurity, but mainly due to the lack of

implementation of reforms by the former government. The significant issues with subsidies were not tackled, leading to an increase in the budget deficit, in the additional financing needs and in the debt. On the monetary front, the official reserves continued to decline, leading to additional borrowing to finance the balance-of-payment needs, which also contributed to an increase in debt.

Looking ahead, and as we write this conclusion, a new government is in place composed of experts and technocrats, not representing any particular party or fraction. At the same time, supporters of the former President Morsi are still gathering and violence is escalating with the armed forces.

If this situation deteriorates and mutates into street fighting between Morsi's supporters and the police and military forces, the economic situation will deteriorate even further and we will clearly move towards the pessimistic scenario, at least in the short term. If the Muslim Brotherhood comes back to power (even though there is a very low probability for that), the outlook will remain gloomy for a long period as the society will be clearly fractured and the business community will be reluctant to invest.

But if the new government stays in power and the transition takes place smoothly, without violence, and the new ministers take action very fast and begin implementing sound policies that would have a positive and immediate effect on people's daily lives, like handling the fuel, electricity and bread shortages, then even Morsi's supporters will be tempted to give them a chance. This, in itself, will help create a healthy environment for introducing the right reforms, and will also reassure both domestic and foreign investors that a new era of stability is dawning in the country. The first sign of a positive reaction to the recent political changes is the commitment by several Arab countries to financially assist Egypt by providing billions of dollars of donations and deposits that will certainly help to stabilise the foreign exchange market. In this case, perhaps we could move towards the optimistic scenario by 2014.

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ANNEX

CASE STUDIES: TUNISIA AND EGYPT

Tunisia

With unchanged policies, Tunisia's gross public debt-to-GDP ratio is projected to decline slowly, from 43% in 2009 to below 40% by 2015. This assumes a primary deficit of 0.9% of GDP over the period 2010–15, with the average nominal interest rate on public debt declining from 4.9% to 3.8% over the same period. The public debt profile is in line with the

government's objective to reduce the ratio to below 40% over the medium term.

At the same time, the government is intending to undertake major fiscal reforms over the medium term, but this is not likely to result in a noticeably different path for the public debt-to-GDP ratio. In particular, the authorities are proceeding with a major reform of the tax system, while maintaining strict controls over public spending, as outlined in the main text of the IMF staff report. As a result, the central government deficit (excluding grants and privatisation receipts) is projected to decline from 3.0% of GDP in 2009 to just over 2.0% of GDP by 2015. Moreover, the authorities intend to submit a draft law to the Parliament in the coming months that will guarantee the financial viability of pension schemes by changing their main parameters.

If key assumptions are held over the next five years at their historical averages, the general government primary deficit would be on average slightly lower than the implied primary deficit underlying the government's current fiscal strategy. This mainly reflects conservative revenue projections in the context of the government's intended tax reform measures. Thus, under the scenario with the key variables at their historical averages, the decline in public debt would be somewhat more rapid and reach just over 38% of GDP by 2015.

The debt outlook is moderately vulnerable to adverse shocks.

Standard bound tests reveal the following:

- As almost 60% of public debt is denominated in foreign currency, 30% real exchange rate depreciation would increase the public debt-to-GDP ratio by around 9½ percentage points of GDP relative to the baseline in 2015.
- With a contingent liabilities shock, the debt path would also increase throughout the projection period, raising the gross public debt-to-GDP ratio by around 9 percentage points of GDP above the baseline scenario.
- A one-half standard deviation shock to real GDP growth over the projection period will add just over 4 percentage points to the public debt-to-GDP ratio relative to the baseline projection by 2015.
- Smaller shocks – including individual one-half standard deviation shocks to interest rates and to the primary balance, and a combined one-fourth standard deviation shock – would all result in a public debt-to-GDP ratio of under 42% by the end of the projection period.

		Actual					Projections						
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Debt-stabilizing primary balance 9/
Baseline: Public sector debt 1/	65.0	52.5	48.8	45.9	43.3	42.8	**43.1**	**42.8**	**42.3**	**41.7**	**40.8**	**39.8**	**-1.5**
Of which: foreign-currency denominated		33.5	29.0	26.7	26.3	25.0	24.3	22.8	21.3	19.8	18.3	16.9	
Change in public sector debt		-1.2	-3.7	-2.9	-2.6	-0.6	0.4	-0.4	-0.4	-0.7	-0.9	-1.0	
Identified debt-creating flows (4+7+12)		3.0	-9.7	-3.7	-2.2	0.2	-1.3	-0.8	-1.0	-1.1	-1.2	-1.3	
Primary deficit		0.3	0.4	0.4	-1.3	0.6	0.9	0.7	0.8	0.8	0.8	0.6	
Revenue and grants		26.5	26.6	27.4	29.9	29.3	28.4	28.5	28.2	27.9	27.8	27.8	
Primary (noninterest) expenditure		26.7	27.0	27.8	28.6	30.0	29.4	29.1	29.0	28.7	28.5	28.4	
Automatic debt dynamics 2/		3.2	-3.5	-3.3	-0.6	-0.4	-1.9	-1.3	-1.6	-1.8	-1.9	-1.8	
Contribution from interest rate/growth differential 3/		-1.4	-2.0	-1.7	-2.4	-0.6	-1.9	-1.3	-1.6	-1.8	-1.9	-1.8	
Of which: contribution from real interest rate		0.6	0.7	1.1	-0.6	0.7	-0.5	0.6	0.3	0.4	0.3	0.4	
Of which: contribution from real GDP growth		-2.0	-2.7	-2.8	-1.9	-1.3	-1.5	-1.9	-2.0	-2.2	-2.2	-2.2	
Contribution from exchange rate depreciation 4/		4.5	-1.6	-1.6	1.8	0.1	...	...	...	...	...	...	
Other identified debt-creating flows		-0.4	-6.5	-0.8	-0.3	0.0	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	
Privatization receipts (negative)		-0.4	-6.5	-0.8	-0.3	0.0	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	
Recognition of implicit or contingent liabilities		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other (specify, e.g. bank recapitalization)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Residual, including asset changes (2-3) 5/		-4.2	6.0	0.8	-0.4	-0.8	1.7	0.4	0.5	0.4	0.3	0.3	
Public sector debt-to-revenue ratio 1/		198.2	183.7	167.4	144.9	145.8	151.7	150.4	150.0	149.2	146.8	143.1	
Gross financing need 6/		5.4	6.7	5.7	2.3	4.6	5.1	5.2	4.9	4.5	4.2	3.9	
in billions of U.S. dollars		1.8	2.3	2.2	1.0	2.0	2.2	2.3	2.3	2.2	2.2	2.2	
Scenario with key variables at their historical averages 7/							**43.1**	**42.1**	**41.2**	**40.2**	**39.2**	**38.1**	**-1.0**
Scenario with no policy change (constant primary balance) in 2010-2015							**43.1**	**41.6**	**41.4**	**40.9**	**40.2**	**39.6**	**-1.5**
Key Macroeconomic and Fiscal Assumptions Underlying Baseline													
Real GDP growth (in percent)		4.0	5.7	6.3	4.5	3.1	3.8	4.8	5.0	5.6	5.7	5.8	
Average nominal interest rate on public debt (in percent) 8/		5.1	5.1	5.3	5.0	4.9	4.9	4.6	4.2	4.0	3.7	3.8	
Average real interest rate (nominal rate minus change in GDP deflator, in percent)		1.4	1.7	2.7	-1.1	1.8	-1.0	1.6	1.0	1.1	1.0	1.3	
Nominal appreciation (increase in US dollar value of local currency, in percent)		-12.0	5.1	6.3	-6.8	-0.6	...	...	...	...	...	...	
Inflation rate (GDP deflator, in percent)		3.7	3.4	2.6	6.1	3.1	5.9	3.0	3.2	2.8	2.7	2.5	
Growth of real primary spending (deflated by GDP deflator, in percent)		4.0	6.6	9.6	7.4	8.0	1.8	4.0	4.4	4.7	4.8	5.3	
Primary deficit		0.3	0.4	0.4	-1.3	0.6	0.9	0.7	0.8	0.8	0.8	0.6	

1/ Indicate coverage of public sector, e.g., general government or nonfinancial public sector. Also whether net or gross debt is used.

2/ Derived as $[(r - \pi(1+g) - g + \alpha s(1+r))/(1+g+\pi+g\pi))$ times previous period debt ratio, with r = interest rate; π = growth rate of GDP deflator; g = real GDP growth rate; α = share of foreign-currency denominated debt; and s = nominal exchange rate depreciation (measured by increase in local currency value of U.S. dollar).

3/ The real interest rate contribution is derived from the denominator in footnote 2/ as $r - \pi (1+g)$ and the real growth contribution as -g.

4/ The exchange rate contribution is derived from the numerator in footnote 2/ as $\alpha s(1+r)$.

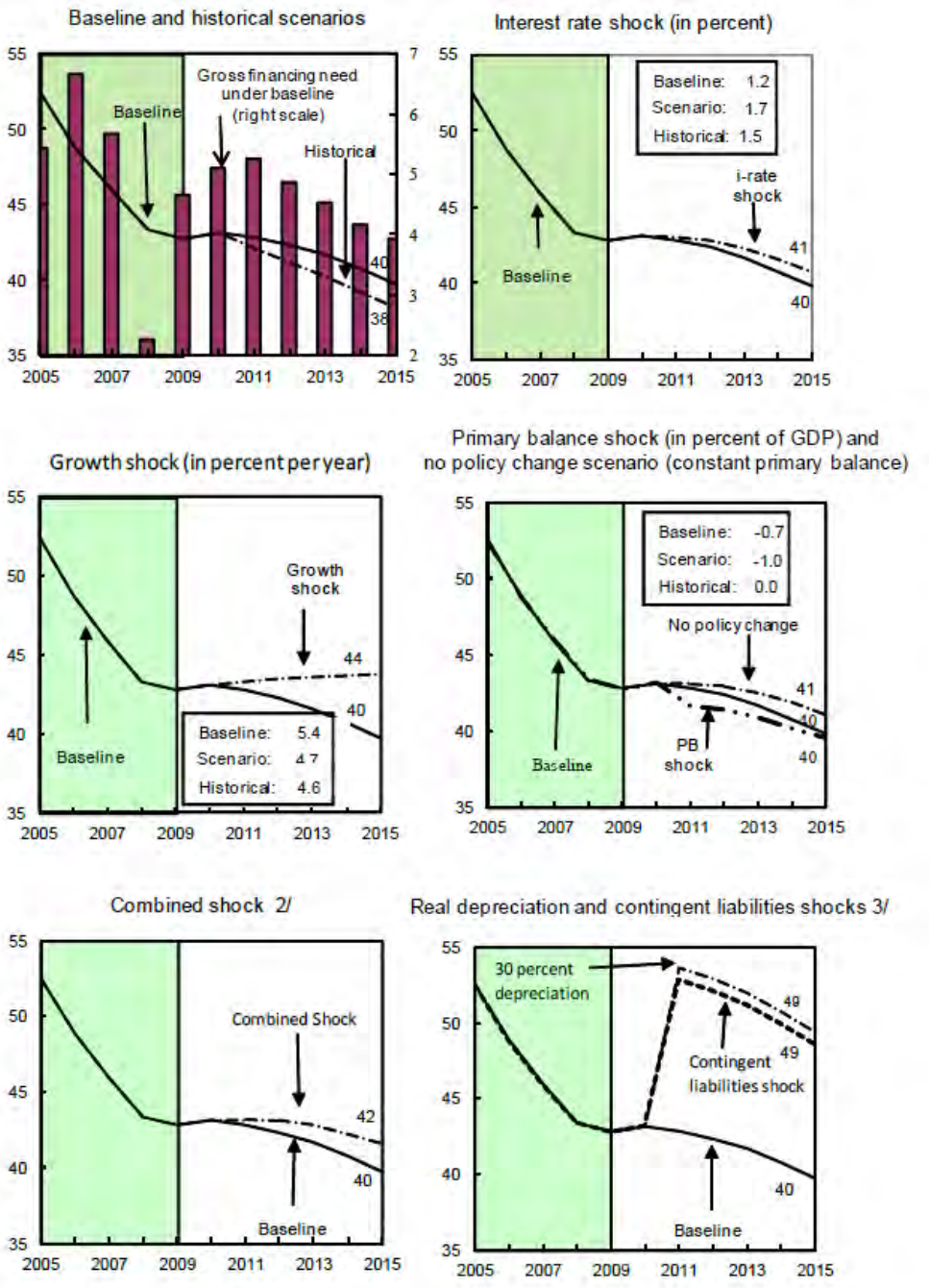
5/ For projections, this line includes exchange rate changes.

6/ Defined as public sector deficit, plus amortization of medium-and long-term public sector debt, plus short-term debt at end of previous period.

7/ The key variables include real GDP growth; real interest rate; and primary balance in percent of GDP.

8/ Derived as nominal interest expenditure divided by previous period debt stock.

9/ Assumes that key variables (real GDP growth, real interest rate, and other identified debt-creating flows) remain at the level of the last projection year.



Sources: International Monetary Fund, country desk data, and staff estimates.
1/ Shaded areas represent actual data. Individual shocks are permanent one-half standard deviation shocks.
Figures in the boxes represent average projections for the respective variables in the baseline and scenario being presented. Ten-year historical average for the variable is also shown.
2/ Permanent 1/4 standard deviation shocks applied to real interest rate, growth rate, and primary balance.

Egypt

Under current policies, Egypt's gross public debt-to-GDP ratio is expected to remain broadly unchanged at 73% of GDP by FY2014-15. This public debt-to-GDP ratio – slightly lower than that recorded during the previous two years – is based on the FY2009-10 budget and assumes largely unchanged policies thereafter, involving primary deficits for the general government and the budget sector as a percent of GDP of about 3% and 2.3%, respectively, over the medium term.

However, Egypt's gross public debt could decline by 15 percentage points to about 61% of GDP in FY2014-15, if the government adheres to its fiscal consolidation strategy (baseline). The government's consolidation strategy entails a reduction of 5% of GDP both in the general government and budget sector deficits over the next five years, bringing them down to about 3.7 and 3.3% of GDP by FY2014-15. The strategy also seeks to turn the general government and budget sector primary deficits into surpluses of about 1.52% of GDP by FY2014-15.

If key assumptions are held over the next five years at their historical averages, the general government primary deficit would be on average higher than the implied primary deficit in the government's consolidation strategy. Thus, the decline in gross public debt would be slightly more moderate at 62.4% of GDP by FY2014-15.

The debt outlook remains vulnerable to adverse shocks. Standard bound tests reveal the following:

- As a quarter of the debt is denominated in foreign currency, a 30% real exchange rate depreciation would increase the debt-to-GDP ratio by around 9 percentage points relative to the baseline in FY2014-15.
- With a contingent liabilities shock, the debt path would also increase throughout the projection period, raising the gross public debt-to-GDP ratio by about 9 percentage points above the baseline.
- Even under smaller shocks – individual one-half standard deviation shocks to real growth, interest rates and the primary balance and a combined one-fourth standard deviation shock – the debt-to-GDP ratios would exceed the projections in the baseline scenario by 5.8% over the projection period.

	Actual					Projections						
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Debt-stabilizing primary balance 9/
Baseline: Public sector debt 1/	112.8	98.8	87.1	76.6	76.2	**74.1**	**72.0**	**70.5**	**67.7**	**64.7**	**61.0**	**-1.8**
o/w foreign-currency denominated	31.6	28.1	24.5	21.6	18.5	18.0	17.5	17.1	16.5	15.7	14.8	
Change in public sector debt	-0.1	-14.0	-11.7	-10.6	-0.4	-2.1	-2.1	-1.5	-2.8	-3.1	-3.7	
Identified debt-creating flows (4+7+12)	-5.3	-12.9	-17.2	-11.1	-2.6	-2.1	-2.1	-1.5	-2.8	-3.1	-3.7	
Primary deficit	2.7	3.4	2.3	3.2	2.8	2.9	2.2	1.6	0.0	-0.6	-1.4	
Revenue and grants	24.8	28.6	27.7	27.8	27.8	24.2	23.9	23.5	23.4	23.0	22.8	
Primary (noninterest) expenditure	27.6	32.0	30.0	31.0	30.5	27.1	26.1	25.1	23.4	22.4	21.4	
Automatic debt dynamics 2/	-7.9	-8.8	-11.9	-11.4	-5.4	-5.0	-4.3	-3.1	-2.8	-2.5	-2.3	
Contribution from interest rate/growth differential 3/	-5.5	-8.7	-11.6	-10.1	-6.3	-5.0	-4.3	-3.1	-2.8	-2.5	-2.3	
Of which contribution from real interest rate	-0.9	-2.0	-5.8	-4.9	-3.3	-1.7	-0.8	0.5	0.9	1.2	1.4	
Of which contribution from real GDP growth	-4.5	-6.7	-5.8	-5.2	-3.1	-3.3	-3.6	-3.6	-3.7	-3.7	-3.7	
Contribution from exchange rate depreciation 4/	-2.4	-0.1	-0.3	-1.3	0.9	...	...	...	...	...	...	
Other identified debt-creating flows	-0.2	-7.5	-7.6	-2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Privatization receipts (negative)	-0.2	-0.2	-1.3	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other (specify, e.g. bank recapitalization)	0.0	-7.3	-6.3	-2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Residual, including asset changes (2-3) 5/	5.3	-1.1	5.5	0.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	
Public sector debt-to-revenue ratio 1/	454.1	345.6	314.3	275.5	274.2	306.2	301.9	300.4	289.4	281.3	267.9	
Gross financing need 6/	24.6	29.6	24.0	25.4	27.7	28.9	28.5	28.1	26.5	25.8	25.0	
in billions of U.S. dollars	22.1	31.8	31.3	41.2	52.2	62.4	70.8	76.8	79.0	83.8	88.5	
Scenario with key variables at their historical averages 7/						**74.1**	**71.5**	**69.0**	**66.7**	**64.4**	**62.4**	**-3.3**
Scenario with no policy change (constant primary balance) in 2010-2015						**74.1**	**72.7**	**72.3**	**72.4**	**72.7**	**73.0**	**-2.1**
Key Macroeconomic and Fiscal Assumptions Underlying Baseline												
Real GDP growth (in percent)	4.5	6.8	7.1	7.2	4.7	5.0	5.5	5.7	5.9	6.2	6.5	
Average nominal interest rate on public debt (in percent) 8/	5.6	5.8	6.4	6.3	6.4	7.7	8.3	8.2	8.3	8.4	8.8	
Average real interest rate (nominal rate minus change in GDP deflator, in percent)	-0.6	-1.5	-6.2	-5.9	-4.4	-2.1	-0.7	1.2	1.8	2.4	2.8	
Nominal appreciation (increase in US dollar value of local currency, in percent)	7.2	0.3	1.1	6.8	-4.7	...	...	...	...	...	...	
Inflation rate (GDP deflator, in percent)	6.2	7.4	12.6	12.2	10.8	9.8	9.0	7.0	6.5	6.0	6.0	
Growth of real primary spending (deflated by GDP deflator, in percent)	2.3	24.1	0.4	10.7	3.1	-6.8	1.6	1.7	-1.2	1.7	1.6	
Primary deficit	2.7	3.4	2.3	3.2	2.8	2.9	2.2	1.6	0.0	-0.6	-1.4	

1/ Public sector refers to gross general government debt.
2/ Derived as $[(r - \pi(1+g) - g + \alpha\varepsilon(1+r)]/(1+g+\pi+g\pi))$ times previous period debt ratio, with r = interest rate; π = growth rate of GDP deflator; g = real GDP growth rate; α = share of foreign-currency denominated debt; and ε = nominal exchange rate depreciation (measured by increase in local currency value of U.S. dollar).
3/ The real interest rate contribution is derived from the denominator in footnote 2/ as $r - \pi (1+g)$ and the real growth contribution as -g.
4/ The exchange rate contribution is derived from the numerator in footnote 2/ as $\alpha\varepsilon(1+r)$.
5/ For projections, this line includes exchange rate changes.
6/ Defined as public sector deficit, plus amortization of medium and long-term public sector debt, plus short-term debt at end of previous period.
7/ The key variables include real GDP growth; real interest rate; and primary balance in percent of GDP.
8/ Derived as nominal interest expenditure divided by previous period debt stock.
9/ Assumes that key variables (real GDP growth, real interest rate, and other identified debt-creating flows) remain at the level of the last projection year.

5. MONETARY POLICY PRE AND POST-CRISIS

SAMI MOULEY

The global financial crisis has called for a rethinking of monetary policies and role of central banking in the southern and eastern Mediterranean countries (SEMCs). This chapter assesses the challenges of the conduct of monetary policies and explores new elements in the evolving roles of central banks in the aftermath of the crisis and the changing macroeconomic environment in the region.

5.1 Operational frameworks of monetary policies conduct

An analysis of the tools for implementation of monetary policies by central banks in Mediterranean countries in both the pre- and post-crisis periods reveals an apparent homogeneity in their operational frameworks, albeit with differences in detail and varying degrees of progress (Table 5.1). Although price stability remains the announced final objective, their weaknesses in terms of regulation and control of interest rates as an operational objective mean that the monetary authorities also adopt quantitative approaches based on targeting monetary and credit aggregates as intermediate objectives.

Differences are nevertheless discernible in the oil-exporting countries (Algeria and Libya in particular), with restrictive monetary policies in place to control the monetary base and absorb the structural liquidity surplus in the banking system. In the other countries, restrictive monetary policies are used by raising key interest rates in order to maintain positive real interest rates in the money market. Generally, one can discern a lower level of interest rates in the dynamics of growth, except in the case of crisis exit strategies (Tunisia, Egypt), and measures for diversification of the instruments of monetary policies, with gradual recourse to underlying and core indicators.

Limited operational independence and slow migration to systems for formal inflation-targeting characterise most of the central banks, with the

exception of Turkey and Morocco. The excessive use of subsidies and price control mechanisms seems to be the main obstacle to the adoption of explicit inflation targets.

Regarding exchange rate policies, targeting the real effective exchange rate is the operational rule in the case of countries choosing managed floating schemes, while fixed anchoring of the nominal exchange rate is the primary instrument in the pegging regimes to the dollar or to Special Drawing Rights (SDRs).

Programmes aimed at restructuring of banking systems (supervision, prudential norms, etc.) for better resilience have been initiated, but recurring vulnerabilities remain concentrated in the portfolios of non-performing loans with insufficient provisioning (except in the particular case of Morocco). In addition, the attractiveness of foreign investment in most countries is diminished by several constraints, in particular the slow pace of capital accounts liberalisation and the lack of management structures for systemic liquidity.

Table 5.1 Operational frameworks for monetary policy in selected SEMCs

	Final objective	**Intermediate objective (target)**	**Instruments of control**	**Operational framework**
Algeria	Inflation rate	Stability of real exchange rate	Central bank's key interest rate	Liquidity rate control
Egypt	Inflation rate	Stability of nominal exchange rate Core inflation index	Central bank's Key interest rate Rules of broad money control	Monetary targeting Implicit mechanism of inflation targeting
Jordan	Inflation rate	Monetary base	Reserve requirement ratios	Nominal exchange rate targeting
Lebanon	Inflation rate	Stability of nominal exchange rate	Liquidity rate	Sterilisation mechanism Control of treasury bonds rate
Morocco	Inflation rate	Stability of real exchange rate	Central bank's Key interest rate	Formal mechanism of inflation targeting
Tunisia	Inflation rate	Stability of real exchange rate Monetary base	Reserve requirement ratio Central bank's key interest rate (call for bids rate)	Monetary targeting
Turkey	Inflation rate	Stability of real exchange rate	Central bank's key interest rate	Formal mechanism of inflation targeting

Source: Compilation by authors.

In Algeria, a cautious monetary policy has been pursued in line with the official objective of controlling inflation. Hence, the Bank of Algeria has continued to absorb the structural liquidity surplus of the banking system through auctions to counterbalance budgetary stimulation and the rapid growth in bank deposits by the national oil company. The expansion of credit in the economy has slowed significantly.

Egypt had an extremely high rate of inflation, reaching 16.2% in 2008-09, before falling to 11.7% in 2009-10, because of the rise in the price of wheat, increases in salaries and a partial reduction of subsidies on fuels. At the end of August 2008, the consumer price index reached a peak of 23.6% on a year-on-year basis. Monetary policy was thus accommodative and reactive, as it was during the global financial crisis when in 2009 the central bank introduced six increases of the key interest rate to contain inflationary pressures and ensure macroeconomic stability. In fact, the central bank has begun a gradual process of migration towards a formal system of inflation-targeting by developing new monetary instruments to allow a new target rate to be set. In 2009, the central bank launched a core inflation index based on the unadjusted Consumer Price Index (CPI).

In Jordan, the annual average inflation rate, determined by the Consumer Price Index (CPI) reached 13.9% in 2008,[1] in response mainly to the trend in oil and food prices. Also, the depreciation of the US dollar partially contributed to the increase of the inflation rate during this period due to the pegging of the local currency to the dollar. In order to manage inflationary pressures, the Central Bank of Jordan adopted a monetary policy based on price stability. In 2009, it lowered its key interest rate three times (by 0.5% each time), decreased the reserve requirement rate and suspended the depositary certificate's issues to strengthen the liquidity of the country's financial system.

During the first half of the last decade, Lebanon had low inflation rates. However, due to the hike in world food and oil prices observed since 2006, inflation rose sharply to reach 10.8% in 2008 before dropping to 4.5% in 2010. The Central Bank of Lebanon is pursuing a monetary policy totally oriented towards stabilising the exchange rate of the local currency against the dollar by controlling the volume of liquidity. Against this backdrop a downward trend in the level of interest rates was recorded, combined with measures to combat the inflationary effects of capital inflows. The

[1] In 2008, Jordan ended subsidies on petrol and gas products. This led to a sharp rise in the prices of these products in the local market and contributed to the rise in inflation.

monetary sector performed well, reflecting the positive trend in the real sphere and recording a massive reconversion of assets into local currency, estimated at more than $10 billion in 2009 (against $8 billion in 2008), resulting in a *de facto* reduction in the dollarisation rate of deposits at 63.2% in 2010 (the lowest level in 10 years). Moreover, these reconversions considerably strengthened the foreign currency assets of the central bank, which reached an envelope of $29.6 billion in 2010 (i.e. 10.3 months of imports and roughly 80% of GDP) against $28.3 billion in 2009 and $19.7 billion in 2008. However, this generated an abundance of liquidity in Lebanese pounds, hence lowering the interest rates on local currency deposits. The banking system is structurally supported by the increase in deposits at a steady pace (approximately 11% in 2010) due to the attractiveness of the remuneration rates and the confidence inspired in depositors from tying the Lebanese pound to the dollar. Nevertheless, Lebanese banks prefer to cover the major part of the financing needs of the State rather than grant credits to the private sector. This means they are exposed to sovereign risk and also vulnerable to strong dollarisation of deposits.

In Morocco over the last two years, inflation trends were marked by a significant easing of the pressures inherent in the demand. The inflation rate stabilised in 2009 as well as in 2010 at only 1%, compared to 3.7% in 2008. This moderate trend can mainly be explained by the weak pressure from internal demand, by the performance of monetary policy as well as the continuous intervention by the government through social welfare funds. Trends in the monetary sector have been characterised by a marked slowing in the money supply and credit. Indeed, the growth of the M3 money supply slowed down in 2010 at 4.8% compared to 7% in 2009 and 13.5% in 2008. Bank loans to the economy followed the same trend, increasing by only 10% in 2010, compared to 12% in 2009 and 23.4% in 2008. This downswing shows a return to levels in compliance with the fundamentals of the economy and this took place after the strong growth of these two indicators observed during the period 2005-07.

Monetary policy is based on the mechanisms of quantitative regulation. Its main objective is to control inflation in line with economic development. It was a major factor in maintaining the inflation rate at a low level, in conserving foreign balances and strengthening the stability of the real exchange rate of the Dirham. According to the IMF, the Central Moroccan Bank now generally satisfies the prerequisites for inflation targeting: it has operational independence, the expertise and the necessary statistical resources as well as a full range of monetary policy instruments which it continues to improve. Its analytical and operational framework is

very close to that of the central banks that have adopted explicit inflation targets.

In Tunisia, the implementation of monetary policy is characterised by a trend in the interest rate that is dependent on the mechanism of managing banking liquidity. Thus, in spite of the amendment to the statutes of the Central Bank of Tunisia (CBT) in May 2006, which sets price stability as the ultimate objective of monetary policy implementation, the current operational framework is still dominated by a two-fold device. The first is a result of targeting the real effective exchange rate with the objective of achieving a competitive depreciation of it. Therefore the CBT intervenes daily in a discretionary manner, even by way of indication, in order to correct the value of the nominal effective exchange rate in a band of 1% between the bid price and the selling rate of the dinar vis-à-vis the main foreign currencies. The second device focuses on a system of intermediate control of monetary aggregates in the broad sense as a stage to be later transformed into a system that formally targets inflation, but where the factors and prerequisites are far from being verified.[2] In particular, since the key interest rate is not fully under control as an operational objective, the CBT continues using, as a temporary measure, a quantitative approach based on monetary aggregates (M3) targeting as an intermediate objective, by influencing the monetary base as the operational objective and essentially by controlling the instruments of the key interest rate (call for bids rate) and the required reserve rate. At the same time, the problems inherent in the mechanism in place related to the predictability of banking liquidity do not allow sufficient flexibility in the money market rate because the existing scheme of financial programming used by the CBT is based on monetary targeting for the purpose of projecting an annual, and later a monthly, target for M3 monetary aggregate (intermediate objective).

As needed for the refinancing operations purposes of the CBT, a target for the monetary base (operational objective since 2004) is deducted at the end of December, by applying the monthly multipliers observed between M3 and the monetary base throughout the current year. This allows a ratio between the estimated M3 monthly target and the monthly target for the monetary base (used as a control variable for fine-tuning

[2] Due firstly to several obvious obstacles, in particular the practice of managed prices and the absence of economic and institutional independence of the CBT, and secondly, the necessary migration at first to a system of a fully flexible exchange rate regime, which is not technically possible at present.

monetary policy operations)[3] to be established. In particular, the current system for controlling banking liquidity and projections of refinancing operations undertaken by the CBT is based on forecasts of the autonomous liquidity factors, with the objective of preserving the short-term average money market interest rate (TMM) in a band of more or less 12 basis points of variability only.

Moreover, at the level of the institutional framework for controlling banking liquidity, the choice of monetary policy mechanisms has privileged indirect fine-tuning instruments in the form of call for bid's operations. The other instruments are only minimally operational and have limited efficiency.[4] Indeed, and since the genuinely operational instrument the central bank uses is liquidity volume, the equilibrium in the interbank money market and control of the money supply are ensured by daily injections (or repurchasing) of liquidity. Managing liquidity needs in this way permits adjustment of supply to the demand for central bank money without a significant variation in the interest rate.

The forecast mechanism for banking liquidity is based on monetary targets and is constrained by the inherent difficulties in the current system. In fact, the financial programming plan used as a basis for setting the annual target for M3 monetary aggregate (intermediate objective) and for projecting banking liquidity depends on the estimation of a money demand function which integrates specifically the annual projections for GDP[5] and those of bank credits stemming from macroeconomic development plans and annual budgets.[6] Once the parameters of the money demand function

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[3] Nevertheless, the multipliers of the monetary base (and of the adjusted monetary base) for the M3 aggregate were, especially in recent years, higher than the projected multipliers, without correcting the accumulated differences on a monthly basis. Therefore the divergence between the monthly target for the monetary base, which is estimated from the target for M3 monthly growth, and monetary policy interventions are not eliminated from one month to the next, from whence derive the increasing cumulative differences between M3 and its intermediate target.

[4] Such as, for example, open-market transactions, repurchase options repo, allowances uptakes, credit standing facilities or deposit standing facilities.

[5] But also of some of its internal components including national savings, the external debt, the balance of payments outcome as well as the parameters for public finances – all provided by specialised agencies (namely ITCEQ, on the basis of its computable general equilibrium model used for the compiling macroeconomic forecasts).

[6] The target may be revised regularly according to occasional intra-annual updates on the development plan.

are stable,[7] it is then a question of deriving the profile or the monthly target for M3 aggregate from the estimate of its cyclical trend, its seasonal component and its irregular (residue) component.

For the refinancing needs of the Central Bank of Tunisia (CBT), a target for the monetary base (operational objective since 2004) is deducted at the end of December by applying the monthly multipliers between M3 and the monetary base throughout the current year; this allows a ratio between the estimated monthly target for M3 and the monthly target for the monetary base to be established. This latter estimated variable is used as a control variable for fine-tuning monetary policy operations. In particular, projections of banking liquidity and consequent refinancing operations are made on the basis of forecasts of autonomous liquidity factors, with the objective of maintaining an average short-term interest rate for the money market band within a band of +/- 12 basis points of variability.

Nevertheless, the current forecasting mechanism shows some weaknesses. In particular the multipliers of the monetary base (and of the adjusted monetary base) for M3 aggregates[8] were higher compared with the forecast multipliers,[9] especially in recent years; and the accumulated deviations were not subject to any monthly corrections. Therefore, the deviations between the monthly target of the monetary base, which is estimated from the M3 monthly growth target and monetary policy interventions, are not eliminated from one month to the next. This results in increasing cumulative differences between M3 and its intermediate target, which were the cause of increasing excess liquidity in the banking system. Furthermore, the cumulative differences between growth rates of the monetary base and the M3 aggregate, have led to large deviations since 2004 between forecasted compared with the observed target of monetary aggregates, and which therefore contributed to excess of liquidity.[10]

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[7] In particular, econometric studies on this question show that income and interest elasticities, which are estimated on the basis of this money demand function, although positive, reveal the relative weakness of the second parameter compared to the first, due to the continuing incapacity of monetary policy to use interest rates as an operational objective.

[8] Intermediate target used by CBT since 1989.

[9] Regarding projected multipliers.

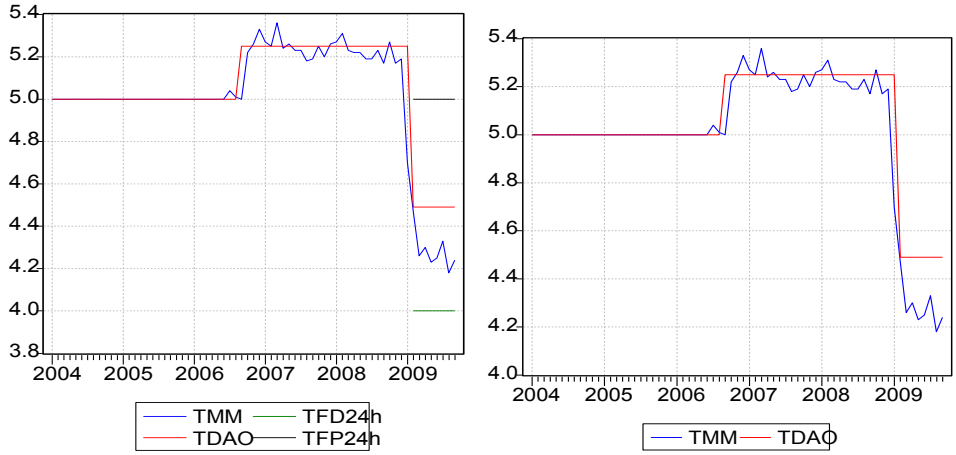
[10] At the M3 level, the average deviation in the period 2004-10, for example, was 1,301 MDT, which also coincides with the global surplus liquidity in the banking system.

The money market rate responds to the management of the banking liquidity by CBT and in particular to the evolution of the call for bids rate, which represents the central bank's key interest rate (TDAO). Nevertheless, in practice, the evolution of the money market rate (TMM) was characterised by three tendencies: i) initially, full indexation to the TDAO previously fixed at 5%; ii) then, partial de-indexation of the key interest rate raised to 5.25% and finally iii) the beginning of a full de-indexation of the key rate reduced in February 2009 by 75 basis points to settle at 4.50%.

In fact, this de-indexation is not only linked to the drop in the key interest rate but above all to the introduction of two new money market instruments during the same period in accordance with CBT circular to credit institutes No. 2009-07, dated 19 February 2009. It concerns credit and deposits standing facilities for 24 hours for banks allowing them to cover their needs or place temporary liquidity surpluses. The deposit facility is remunerated at a rate equal to the CBT's key rate minus a margin.

A band (corridor) of 100 basis points is set between the interest rate on the deposit facility (TFD 24h) set at 4% and the interest rate on the credit facility (TFP 24h) set at 5%. Since the CBT turned away from fine tuning in February 2009, convergence between the money market rate and TFD 24h occurred. Therefore, instead of inferring a flexibility to a drop in the money market rate, these new instruments totally de-indexed the money market rate of the CBT's key rate (call for bids rate, TDAO) and led to a *de facto* and gradual convergence of it with the interest rate on deposit facilities, which remains high considering the financing needs of companies by structurally inducing disproportionate loan costs (Figure 5.1).

Figure 5.1 Convergence of deposit rates 2006-2009 in the case of Tunisia



Finally, despite a context of strong growth in food and energy prices, Turkey enjoyed in 2009 its best performance regarding inflation for years. The inflation rate stabilised at 6.3%. In 2010 inflationary pressures were highly exacerbated due the global hike in prices for basic products and also due to the increase in locally managed prices (the price of gas in particular). Consequently inflation reached 8.6%. At the same time, as part of its efforts to cope with the world crisis and its global repercussions, an unprecedented softening of the monetary policy was noted from November 2008 until December 2009, with a drop in the key rate of 1,025 basis points.

5.1.1 Transmission channels of monetary policies post crisis

Although the trends in inflation in the post crisis period are globally dependent on the international prices for energy and food as well as pressures inherent in domestic demand in the Mediterranean region, the transmission channels for monetary policies depends on other factors. The determinants of inflation address simultaneously i) inflationary components of monetary origin, ii) inflationary components induced by internal demand (or cyclical factors) and iii) early indicators linked to exogenous factors. In our case practice, the non-availability of all data on a monthly basis (specifically for GDP, import prices index[11] to detect imported inflation and pass-through or other specific qualitative indicators) means that valid proxies must be selected.

A modelling based on VAR and VECM systems and on simulations of impulse shocks led to the conclusion of the primacy of monetary channels (bank loans and nominal effective exchange rate) in the transmission of monetary policies. Generally it illustrates the difficulty of using the interest rate as an operational objective (except in certain countries). Notwithstanding the anticipatory mechanisms, the theoretical determinants of inflation can be divided into three groups:

First of all, taking Tunisia as the reference case, an evaluation of the impacts of specific economic determinants on the behaviour of inflation was made on a monthly frequency basis for the period 01:2004 – 12:2009. In

[11] These data are available only on an annual and quarterly basis (since 2000). In particular the use of monthly values for the output gap calculated from filtered trends of an industrial production index (as a proxy for monthly GDP) does not allow satisfactory econometric estimations to be established. All the data are from Central Bank of Tunisia.

particular the following battery of determinants for inflation in Tunisia was used:[12]

- At the level of structural factors or inflation components of monetary origin, behaviour of loans to the economy (CREDEC) and the trend in the nominal effective exchange rate (TCEN)[13] were selected to determine the mechanism ascribed to the exchange rate pass-through effect.
- At the level of domestic demand components or cyclical inflation factors, initially imported inflation was used. In this context we referred to fluctuations in the international price for energy imports (PENERGI).[14] Generally speaking, variability of international prices of main imported raw materials (energy and non-energy) is considered as a proxy not only for imported inflation but also of exogenous supply shocks.[15]
- Finally, the cyclical position of the economy is evaluated based on variance in real GDP at constant prices approximated by the industrial production index (IPI)[16] base 100:2000. Because of a high correlation rate between the growth rate of quarterly GDP and the growth rate of the industrial production index (IPI), the latter was in fact used as a direct proxy for monthly GDP.[17] Also, using the IPI means agriculture can be excluded from production since it is a sector

[12] To this is added, of course, price inflation for foodstuffs as a determinant of inflation in Tunisia, and incidentally visible from the comparison between inflation (headline inflation) and underlying inflation (core inflation). See supra.

[13] A specific methodology was used to calculate the TCEN on a monthly basis. For details, see Mouley (2011).

[14] We have used the international Brent oil price in dollar. The volatility of imported energy prices (Brent oil price) can in fact be used as a valid proxy for imported inflation.

[15] Previous studies have already demonstrated that these are the obvious causes of inflation in Tunisia (see, in particular, IMF, 2010).

[16] This is a suitable approximation of the cyclical position of the economy due to the absence of data on a monthly or quarterly basis for productivity.

[17] Globally, the same results for estimates are obtained when the IPI is used to establish a monthly frequency from the quarterly GDP according to the Chow and Lin method.

that is heavily dependent on the vagaries of the weather and would tend to distort the results of the econometric estimations.[18]

The inflation rate (TINF) is based on monthly inflation with year-on-year rates and is calculated from the monthly consumer price index (IPC).[19] We have added the trend in the monetary market rate (TMM) to these determinants, to allow for monetary policy intervention in the interbank market, as well as the trend in the stock market index (TUNINDEX) base 100:2000. On the other hand, at the level of exogenous variables, besides the price for energy imports (PENERGI), we have added variability of foreign supply, approximated by the fluctuation in the industrial production index of the eurozone (IPIZE). All the data used are expressed as logarithms in terms of levels except for the interest rate.

The procedures of augmented Dickey-Fuller tests (ADF) applied to variables converted into logarithms (except for money market rate) enabled us to reject the null hypothesis of the unit root for all variables which are therefore non-stationary in level. However, first differences show a stationary behaviour. A non-stationary state of variables in level means making econometric estimates in a multivariate frame. In the absence of co-integration relationships between the variables used, a VAR model in terms of level is estimated without restrictions on the estimated coefficients.[20]

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[18] The output gap, calculated from the gaps between the industrial production index on a monthly basis compared with its potential value (confirming the argument of Stock & Watson, 1999), can also provide a determinant for the behaviour of aggregate demand where data are available only on an annual basis but which, however, are nevertheless fundamental to detect inflationary movements due to the rise in demand. However, the consideration of the output gap on a monthly basis did not provide appropriate statistical adequation in the models used.

[19] The IPC is an index of Laspeyres (base 100:2000) calculated from a basket containing 952 products divided into six groups (food, housing, clothing, health, transport, services and others) and 43 subgroups of products. The weightings are linked to the last survey on budget and household consumption.

[20] The restrictions on the estimated coefficients deducted from a co-integration relationship allow us in fact to construct a structural model based on estimating a VECM shape with errors correction. The imposition of long-term restrictions deducted from a co-integration relationship improves the quality of VAR estimates appreciably. We can convert the model to VAR-S by using a Cholesky decomposition applied to the residual vector $Y_t = \sum_{i=1}^{\alpha} C_t . e_{t-i}$. This decomposition

Since all variables are I(1) in level and thus I(0) in first difference, the VAR(p) model estimated in level is expressed as follows:

$$Z_t = A(L)Z_{t-1} + B(L)X_t + \mu_t$$

Where Z_t is the vector of endogenous variables, X_t a vector of exogenous variables and μ_t a residual vector. The structure of the lags or the number of optimal lags in the VAR model was determined using Akaike's AIC information criterion as well as using the likelihood ratio test (LR), which consists of comparing two alternative lags according to the following set of hypotheses:

$$\begin{cases} H_0 : p = p_0 \\ H_1 : p = p_1 \qquad p_1 > p_0 \end{cases}$$

The test statistics can be expressed as follows:

$$LR = -2\left(\hat{L}_0 - \hat{L}_1\right) \equiv T\left(\log\left|\hat{\Omega}_0\right| - \log\left|\hat{\Omega}_1\right|\right) \rightarrow \chi^2_{(q)}$$

$\hat{L}_0$ and $\hat{L}_1$, respectively are the log likelihoods relating to the estimation of $\text{VAR}(p_0)$ and $\text{VAR}(p_1)$ models. $\hat{\Omega}_0$ et $\hat{\Omega}_1$ are variance-covariance matrices of the residual estimation of $\text{VAR}(p_0)$ and $\text{VAR}(p_1)$ models respectively which are expressed as follows:

$$\hat{\Omega}_i = \frac{1}{T}\sum_{t=1}^{T} \hat{\varepsilon}_t(p_i)\hat{\varepsilon}_t'(p_i) \qquad i = 0,1$$

$|.|$ indicates the determinant of $\hat{\Omega}_i$, i=0,1. $q = n^2\left(p_1 - p_0\right)$ indicates the number of restrictions under a null hypothesis H_0. *(n)* is the number of equations or endogenous variables. By comparing specifications of VAR(1)

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ensures orthogonality of the individual shocks or that the $V(e_t)$ variance-covariance matrix is diagonal. In fact, this avoids the bias linked to the arbitrary selection of the order of introduction of endogenous variables into the VAR model.

and VAR(2), the preceding tests enabled us to conclude that dynamics are better expressed by the specification VAR(1).[21]

The effects of the impulses and the implementation of monetary policy on the level of inflation are generally transmitted through the following channels:

- Interest rate channel: In the sense that a variation in the real interest rate affects the decisions of economic agents through higher costs of financing consumption and investment.
- Exchange rate channel:[22] A modification of the intervention measures of the monetary policy acting on the interest rate results in a reallocation of financial portfolios, which impacts on the exchange rate[23] in an open economy with capital mobility. It results in price-effects of the exchange rate on foreign trade.
- Bank credit channel: In an economy where financing is dominated by banking intermediation, intervention measures of monetary policy act directly on the potential volume of loans offered by the banking system, and consequently modify the amount of deposits and reserves.
- Price of financial assets channel: Modification of the instruments of monetary policy impacts the price of financial assets as a result of portfolio arbitration that companies carry out between prices of equities and bonds[24] or wealth arbitration, which consumer households perform between holding currency and holding securities (liquidity effect).[25]

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[21] Akaike's AIC criterion increases when passing from VAR(1) to VAR(2), which considerably reduces the number of statistically significant parameters. The number of degrees of freedom does not allow us to go beyond VAR(1). To evaluate the strength of the model, we modified the order of introduction of endogenous variables in the VAR model. The results obtained did not change significantly.

[22] Impacts of volatility of exchange rate on prices (pass-through).

[23] In what follows, this will be the nominal effective exchange rate because of the specificities of the exchange arrangements and restrictions in Tunisia (basket of currencies with managed floating) and daily interventions managed by Central Bank of Tunisia, although specialised literature generally uses the real effective exchange rate.

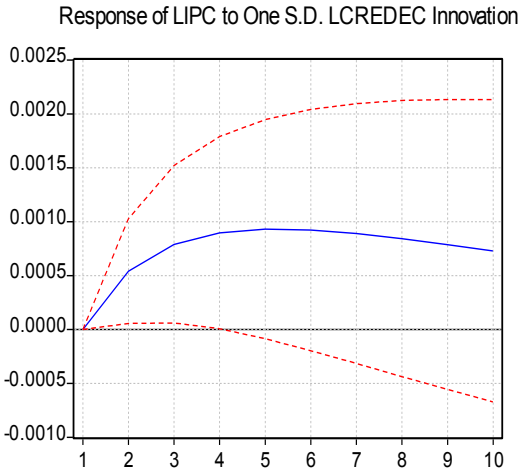
[24] Or regarding investment decisions (q of Tobin).

[25] This effect returns to the approach of portfolio selection from Tobin. J.

- Balance sheet channel: By affecting the value of guarantees (or collateral) due on bank loans, the decisions of monetary policy affect the profitability of companies and the solvency of consumers, which leads banks to adjust their volume of loans.[26]

With the VAR(1) level model[27] estimated, the impulse response functions or the domestic shock effects[28] of monetary policy equivalent to an innovation of one standard deviation at the level of domestic prices with a confidence interval of 95 % are given as follows:

- A monetary shock of a temporary and unexpected increase of credit to the economy will lead to an immediate inflationary impact on the level of prices which will stabilise and become permanent from the fifth month:

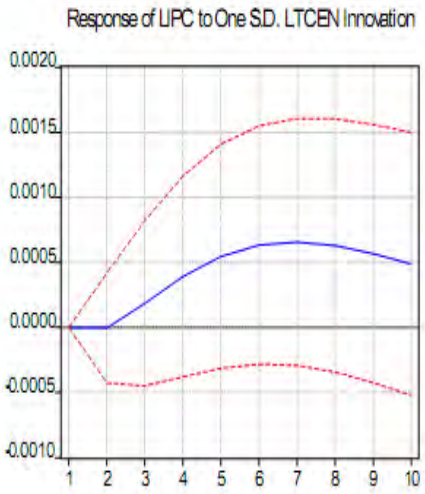


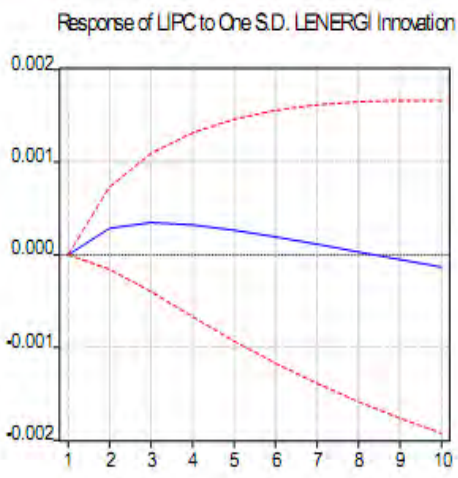
[26] The repercussions of this transmission channel cannot be established without data on the volume of collateral required by banks in Tunisia. According to inquiries made on the competitiveness of Tunisian companies (essentially SMEs), it seems that the main obstacle to private investment in Tunisia mainly consists of constraints posed by the volume of collateral required by banks for loans.

[27] In particular, in an analysis of the transmission mechanisms of monetary policy, the use of VAR level models is justified due to the fact that transmission mechanisms of monetary policy are by essence short-term phenomena.

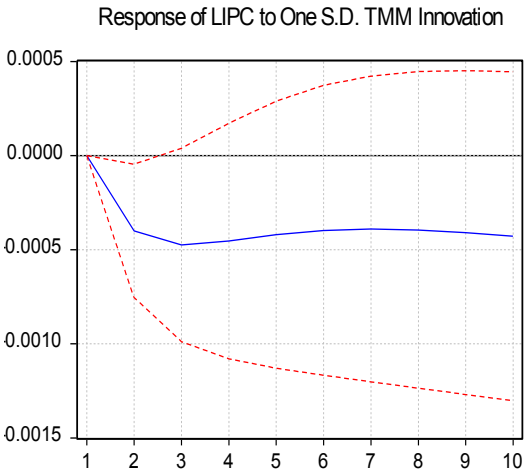
[28] See in the following impulse response functions instead of variance's decompositions.

- At the level of the pass-through effect, a temporary and unexpected drop in the nominal effective exchange rate will induce a temporary rise in the inflation. This is accompanied by the same effect, but of a more limited extent, of an increase in the price of energy imports:





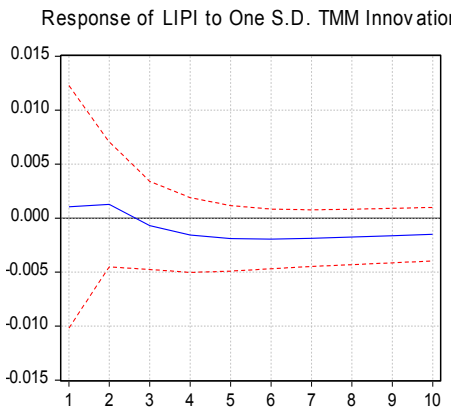
- A rise in the interest rate (restrictive monetary policy) temporarily reduces inflation but induces a subsequent contraction of short-term activity, which then helps to stabilise the level of medium- and long-term prices (sacrifice ratio). Conversely, any real supply shock, and thus an expansion of activity, will lead to inflationary pressures on the general level of prices (augmented Philips curve) which nevertheless tend to become neutral from the 10th month and end with a non–accelerating inflation rate of unemployment (NAIRU). Although the interest rate channel appears to be verified, the amplitude of the reaction of prices to a temporary and unexpected shock of a rise in the interest rate is low and short-term and the restrictive effect tends to become neutral at the end of the 4th month.

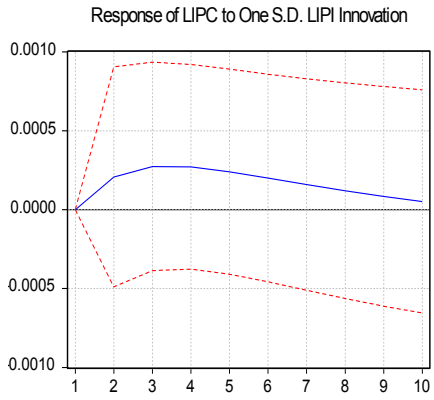


- As a consequence, it seems that the standard mechanism of action via the interest rate collides with an inverted phenomenon of the Keynesian trap to liquidity, in the sense that implementation of a restrictive monetary policy that involves an increase in the interest rate proves ineffective by generating disinflation only in the very short term. In the medium term, however, the supply of liquidity specifically via bank loans will tend to increase in spite of the adjustment to higher interest rates, which is likely to contribute to a resumption of inflation.[29] Moreover, several academic studies have confirmed the low elasticity or total inelasticity of gross fixed-capital formation at the interest rate in Tunisia, irrespective of the specifications adopted by the investment function. The extent of the reaction of prices to a temporary and unexpected shock of the interest rate is lower than that caused by a monetary shock (bank loans or nominal effective exchange rate):[30]

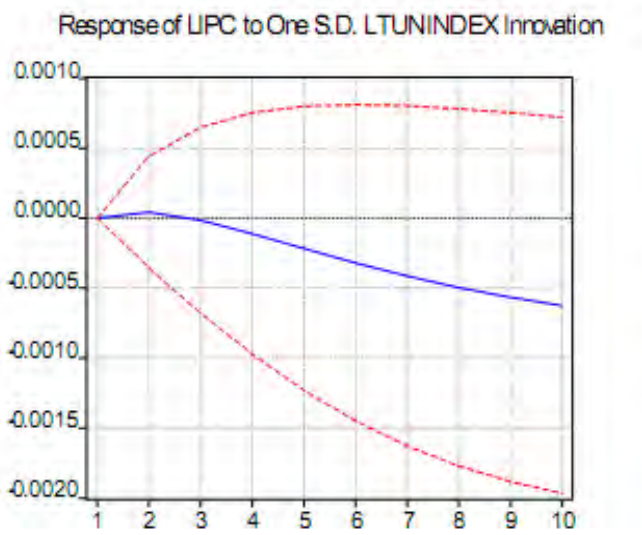
[29] This fundamental result illustrates the difficulty of using the interest rate as an operational objective, a primordial prerequisite to the migration towards a strategy of direct inflation-targeting.

[30] Considering the weak capacity for using the interest rate as an operational objective, the current framework of monetary policy, based on broad monetary aggregates-targeting and supported by an active exchange rate policy, can effectively be used to control inflation, including imported inflation.





- Finally, the financial assets price channel seems totally inoperative in Tunisia. In theory a modification of the monetary policy instrument (for example a drop in the interest rate) would cause a rise in inflation that would lead to a rise in the price of financial assets as a result of portfolio arbitration, and specifically the wealth (liquidity) effect that would follow (increasing preference for holding bonds and debentures against holding currency). In this case, an increase in the TUNINDEX index is associated with a drop in inflation, which makes the impact of this transmission channel contrary to the expected theoretical effect:



Therefore the monetary channels (bank loans and nominal effective exchange rate) are the main transmission channels of monetary policy in Tunisia. On the other hand, and because of delays in transmitting monetary policy to inflation, the interest rate channel appears to be weak. Consequently, in order to influence banking liquidity, a modulation of the monetary policy would be useful with temporary intervention mechanisms targeting the monetary transmission channels – exchange rate and bank loans. Another striking fact concerns the blocking of transmission channels for monetary policy. Monetary policy influences the conditions of financing provided by banks to companies and brings transmission mechanisms into play that interfere with their investment decisions and affect their profitability. In fact, an increase in the interest rate (monetary policy tightening) temporarily reduces inflation. Nevertheless, the response range of prices is weak and short-term in Tunisia. This basic result reveals the difficulty of using the interest rate as an operational objective. Moreover, the response range of prices to the interest rate is much weaker than that induced by a monetary shock (bank loans or nominal effective exchange rate).

Specifically, although CBT undertakes to influence the short-term nominal interest rate (or money market rate) by fixing its key rate or its call for bids rate (depending on the level of banking liquidity), the relevant interest rate that should be analysed is rather the long-term real interest rate, which represents the real cost of loans in case of investment financing by banks. However, in this context, there is a time inconsistency between current implementation of monetary policy and the expectations of Tunisian companies. Lowering the interest rate puts the economy in a liquidity trap because operators no longer decide between money and securities so that an increase in the money supply (injection of money) has no effect on real activity. In situations of deflation crises, where a real interest rate close to zero would be useful, this rate cannot be obtained. This suggests having a target of positive inflation.

In reality, there is no single interest rate but an outfit range in which each rate corresponds to a term (maturity) and a category of specific borrowers. The sequence of rates used for various outlooks constitutes the curve of rates, which is still not yet available in the banking system. In such circumstances the intervention of the CBT at the short end of the curve, by fixing the reference rate for operations on a day-to-day basis (key rate), has no effect on debtor rates according to which loans are calculated. Freeing up the interest rate channel requires implementation of unconventional mechanisms and measures.

For the other SEMCs, the comparative analysis of the transmission channels of monetary policy impulses concentrates solely on interest-rate and exchange-rate channels. Estimates are given on a quarterly frequency for a longer period Q1:1990 – Q4:2008, according to the approach developed by Neaime (2008). The inflation rate which refers to quarterly inflation with year-on-year trends is calculated on the basis of quarterly consumer prices indexes (IPC).[31] All variables are expressed in logarithms except the interest rate.[32] Unit root tests applied to variables converted into logarithms mean that the null hypothesis of a unit root for all variables can be rejected, which are therefore not stationary regarding level. On the other hand, the initial differences display stationary behaviour. The non-stationary nature of the variables in level requires econometric estimates to be studied in a multivariate context. In the absence of co-integration relationships between the retained variables, a VAR(1) level model[33] is estimated without restrictions on the coefficients each country. The response functions[34] or domestic shock effects of monetary policy equivalent to an innovation of one standard deviation in the level of domestic prices with a confidence interval of 95% yield the following results.

In Egypt, the prices respond quickly to an exchange-rate appreciation via their tradable goods prices component. The exchange-rate appreciation is inevitably transformed into a lowering of the interest rate to unblock contractionary pressures on domestic output. On the other hand, a fall in the interest rate also reduces capital inflows and helps, in the medium term, to lower the exchange-rate appreciation, which could handicap export competitiveness.

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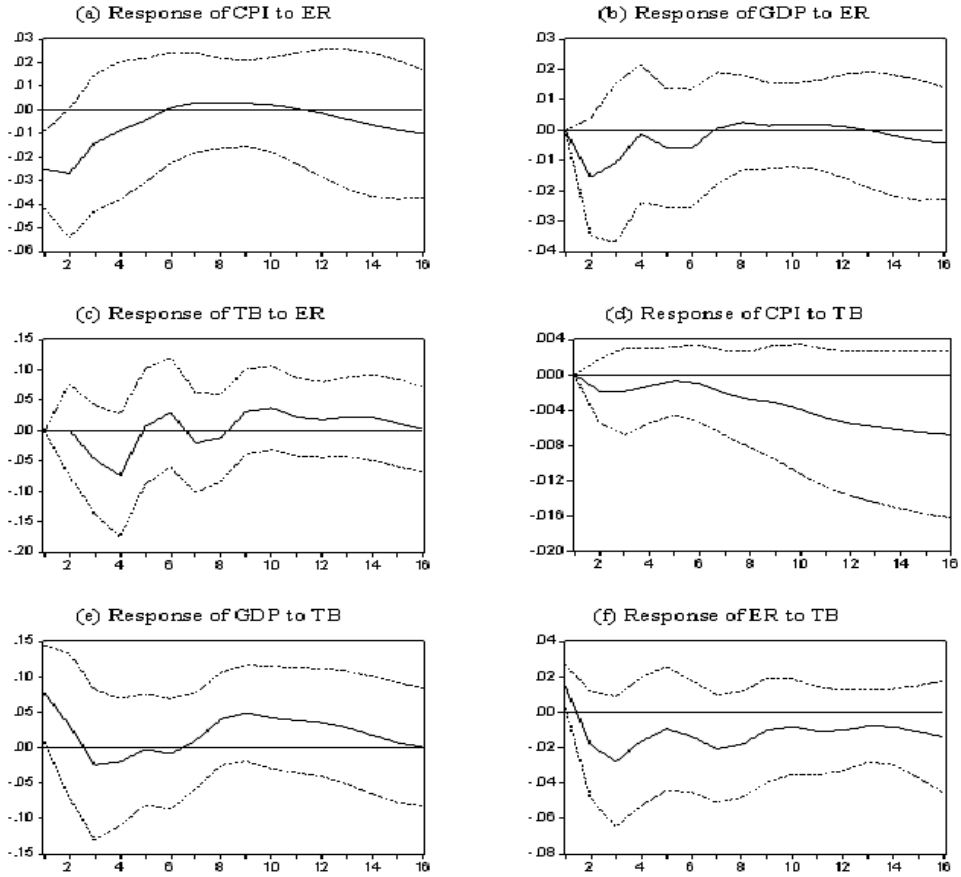
[31] Base 100:2000.

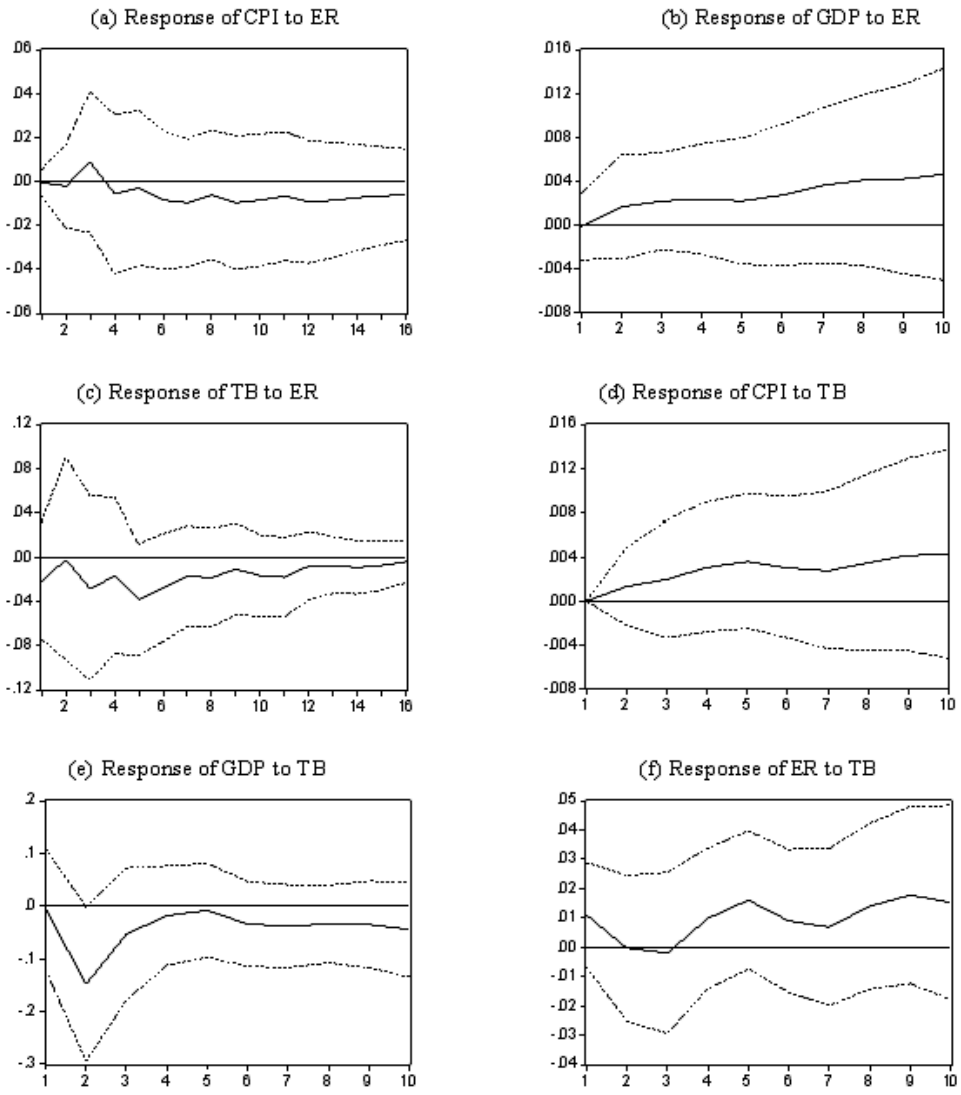
[32] In this case CPI: Log (IPC), ER: Log (TCEN), TB: 3-month treasury bonds rate and GDP: Log (PIB). Data are from the IMF's International Financial Statistics (IFS).

[33] According to Akaike's AIC criteria.

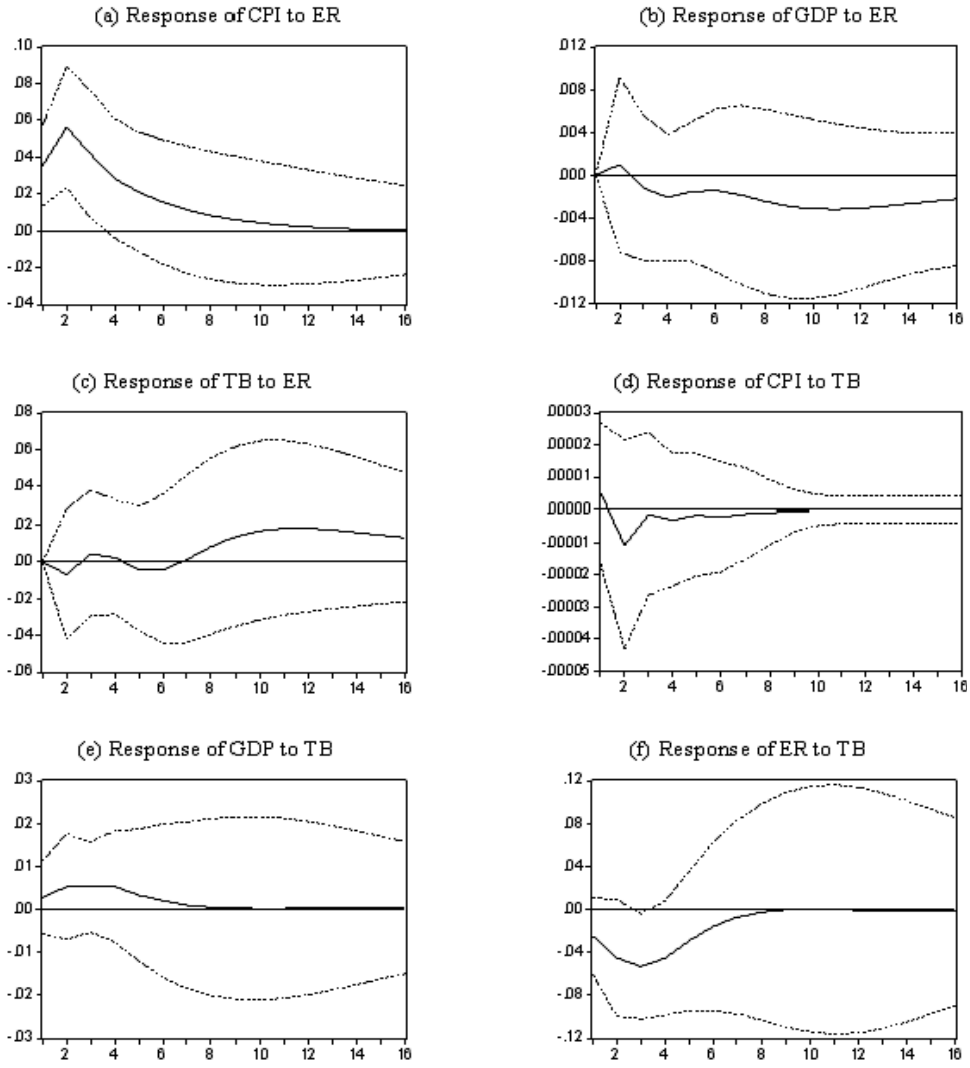
[34] In the following this also refers to impulse functions and not to variance decomposition.



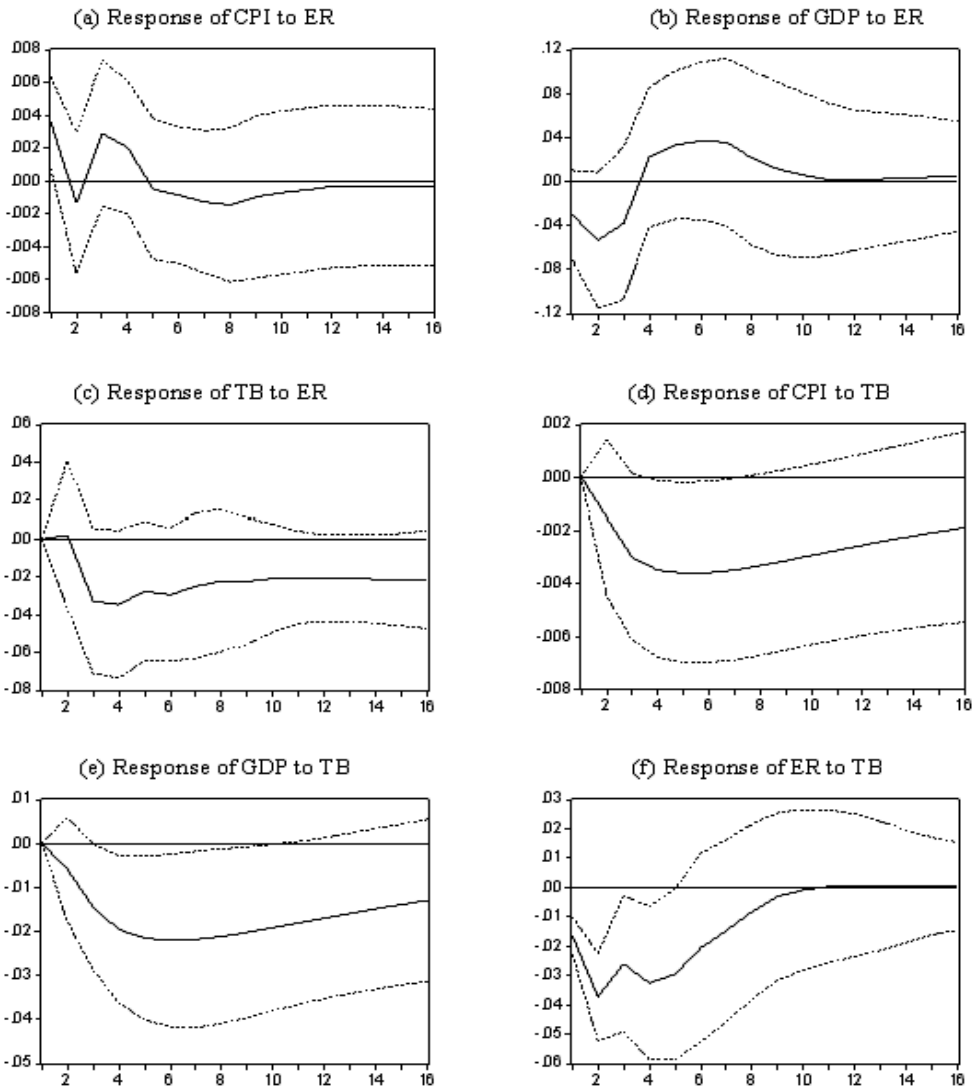
In Jordan, a shock on the exchange rate has a significant effect on output, on prices and on the interest rate. This is mainly attributable to the rigidity of monetary policy, which focuses only on the exchange rate targeting and does not allow fine-tuning of the macroeconomic situation by easing monetary conditions. The effect of a shock on the interest rate appears to be the most significant for GDP, where transmission is fast and with no adjustment delays.



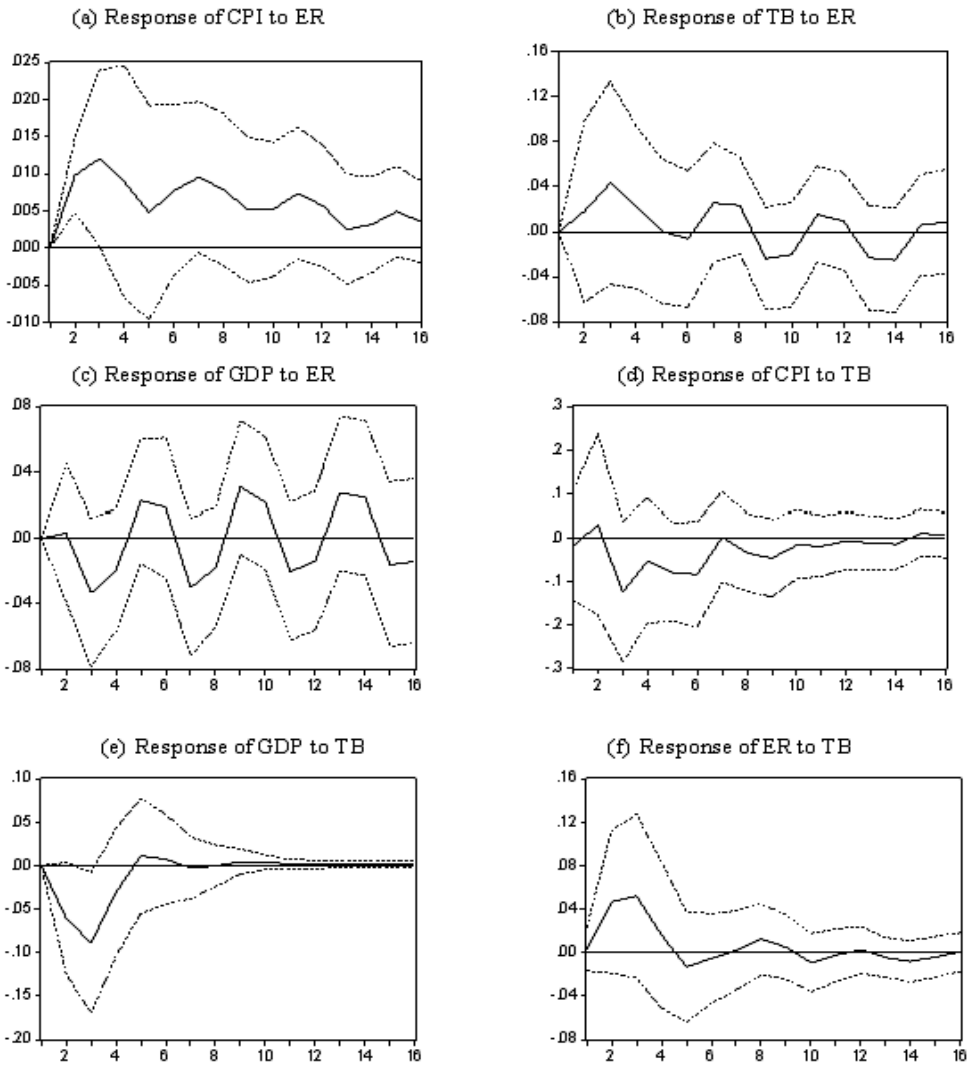
In Lebanon, inflation is affected significantly by a shock on the exchange rate, so that a rise in the interest rate inevitably translates into a nominal appreciation. In fact, this adjustment mechanism is due to the control of the treasury bonds rate by the central bank as an operational instrument of monetary policy in order to stabilise the exchange rate of the national currency.



In Morocco, prices respond quickly to any exchange rate appreciation which is followed by a significant and permanent response to a lowering of the interest rate. Besides prices, real domestic output also decreases in the short term as a consequence of the interest-rate shock and causes contractionary pressures. Lowering of the interest rate reduces capital inflows and contributes in the medium term to lower the exchange-rate appreciation, which could handicap export competitiveness.



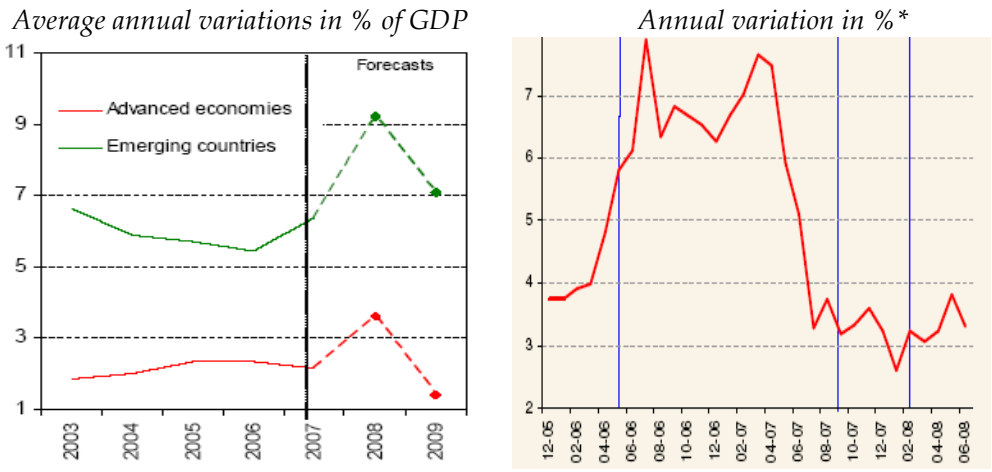
Finally, in Turkey the exchange rate trend appears to be disconnected from GDP dynamics, from inflation and from the interest rate as a result of recent currency crises. The interest-rate channel has become neutral compared with the exchange-rate channel.



5.1.2 *Major constraints on the operational frameworks: Prospects of inflation-targeting in the aftermath of the financial crisis*

The field for implementation of economic policies at an international scale was a major factor in demonstrating the break in the decoupling inflation and monetary policy both in advanced economies as well as in developing economies (Figure 5.2).

Figure 5.2 Comparative inflation rates



* A significant drop in the inflation gap between economies with targeting and the others.

It is therefore advisable to contemplate, using the terminology of Blanchard et al. (2010), rethinking and redefining monetary policies in the aftermath of the financial crisis. Several leading ideas on this question were swept away by the crisis. Such is the case of the hypothesis according to which monetary policy should only address the volatility and level of inflation. New approaches suggest that central banks should accept and even target inflation rates beyond the objective of 2%, and combine monetary policy and macroprudential policy more closely in a more countercyclical manner than before. Monetary policy would then focus more on financing growth for lack of prudential instruments, allowing the credit spillover effects towards assets markets to be controlled. More particularly, as economies with formal targeting mechanisms have defined them according to inflation rates, the question is whether it would be better to target the level of prices. A target focusing on the level of prices offers several advantages, including: i) a reduction of uncertainty regarding the level at which prices will stabilise for long-term forecasts and ii) less variability in production.

But, in this context, major Mediterranean economies are some way behind formal inflation-targeting because of non-compliance with several technical and institutional prerequisites. The evaluation of compliance with the constituent elements of formal inflation-targeting in Mediterranean countries is analysed in Table 5.2, which breaks them down into four blocks: i) institutional elements, ii) operational elements, iii) technical elements and iv) organisational elements.

Table 5.2 Compliance with constituent elements of inflation targeting in selected SEMCs

	Levels of compliance						
	Algeria	**Egypt**	**Jordan**	**Lebanon**	**Morocco**	**Tunisia**	**Turkey**
1. Institutional components							
1.1 Mandate focusing on price stability as the priority objective of the central bank	High	High	High	High	High	High	High
1.2 De facto vs de jure autonomy of central bank	Low	Intermediate	Low	Intermediate	High	Low	High
1.3 Accountability of central bank and transparency of monetary policy	Low	Intermediate	Low	Intermediate	High	Intermediate	High
2. Operational components							
2.1 Stability of the macroeconomic framework							
2.1.1 No budget (fiscal) dominance	Low	Intermediate	Low	Low	High	Intermediate	High
2.1.2 Strength of external position	High	Low	Low	Intermediate	High	Low	High
2.2 Stability and efficiency of the financial system							
2.2.1 Efficiency of financial market	Low	Intermediate	Low	High	High	Low	High
2.2.2 Efficiency of monetary market	Intermediate	Intermediate	Low	Intermediate	High	Low	High
2.2.3 Efficiency of foreign exchange market	Intermediate	High	Low	Intermediate	High	Intermediate	High
2.2.4 Stability and efficiency of banking system	Low	Intermediate	Low	Intermediate	High	Low	High
2.3 Efficiency of monetary and exchange operations of central bank	Intermediate	High	Intermediate	Intermediate	High	Intermediate	High
2.4 Efficiency of the interest rate transmission channel	Low	High	Low	Intermediate	High	Low	High

3. Technical components							
3.1 Infrastructure needed for inflation targeting							
3.1.1 Availability of a measure of inflation targeting	Low	Intermediate	Low	Low	High	Low	High
3.1.2 Definition of the inflation target and its duration	Low	Intermediate	Low	Low	High	Low	High
3.1.3 Early indicators of inflation	Low	High	Low	Intermediate	High	Low	High
3.1.4 Technical tools of inflation predictions	Low	High	Low	Intermediate	High	Intermediate	High
3.2 Publishing of regular reports on inflation	Low	High	Low	Low	High	Low	High
3.3 Publishing of regular reports on monetary policy	Low	High	Low	Low	High	Low	High
4. Organisational components							
4.1 Well-established analytical capacities	Low	High	Intermediate	High	High	Intermediate	High
4.2 Transparency of the decision-making process	Low	Intermediate	Low	Intermediate	Intermediate	Low	High

5.2 Rethinking macroeconomic policies: Towards a new early warning system of financial crisis

Early warning system (EWS) models can have substantial value to policy-makers by allowing them to detect underlying economic weaknesses and vulnerabilities, and possibly taking pre-emptive steps to reduce the risks of experiencing a financial crisis. An application of a new EWS of financial crisis is given for Tunisia. The objective is to determine which are the factors that trigger shocks to the real economy (including the commodity market) and distinguish them from those of equity capital markets in explaining the outbreak of financial crisis.

The answer to this question is essential if we want to be able to better detect early signals of crisis in the future. Would we be able to detect in time the occurrence of financial crises? Why do economists fail to predict these crises well in advance? The answers to these questions are crucial because crises have become more frequent and generate large macroeconomic costs. In this context, the identification of early indicators[50] and construction of early warning systems are essential for the prevention of systemic risks and crises. The purpose of the following sections is to empirically determine the factors that may drive currency crises[51] and to learn in terms both of predictability and prevention possibilities. Moreover, the macroeconomic contexts at national and international level but also, and more specifically, the architecture of the national banking (monetary) and financial systems will be highlighted to detect their sensitivity in the occurrence of crises.

5.2.1 Construction and implementation of an Early Warning System: Case study of Tunisia

The leading international monetary and financial monitoring indicator (IVMF) or continuous macroeconomic vulnerability index (IVM)[52] is the dependent variable in our model to build an Early Warning System (EWS). It is based on the same approach as used by Cartapanis et al. (1998, 2002) and Ari & Dagtekin (2007, 2008) in the construction of an indicator of currency crisis, and consists of the average monthly variations of fragility

[50] Eichengreen & Hausmann (1999).

[51] Monetary crises are defined as currency crises, banking crises or twin crises, i.e. a combination of banking and currency crises.

[52] In the literature on early warning signals, two types of alternative indicators are used: the Speculative Pressure Index (SPI) and the Effective Crisis Index (ECI).

and unsustainability indicators that form the credit to the economy (CREDEC), the real effective exchange rate (ITCER), the nominal interest rate (TIN) and the current deficit ratio with respect to international reserves (DEFCRES), weighted by the inverse of their respective standard deviations to standardise volatile components of the index.[53] The data used covered the period from January 1999 to December 2009, on a monthly basis.

The vulnerability indicator is higher in the following cases:

- when excesses in banking credit generate inflationary pressures,
- when the domestic currency appreciates sharply in real terms or the interest rate depreciates in nominal terms or
- when the ratio of current account deficit to foreign exchange reserves is increasing:

$$IVMF = \frac{1}{\sigma_{CREDEC}}.\left(\frac{CREDEC_t - CREDEC_{t-1}}{CREDEC_{t-1}}\right) - \frac{1}{\sigma_{ITCER}}.\left(\frac{ITCER_t - ITCER_{t-1}}{ITCER_{t-1}}\right) - \frac{1}{\sigma_{TIN}}.\left(TIN_t - TIN_{t-1}\right) + \frac{1}{\sigma_{DEFCRES}}.\left(DEFCRES_t - DEFCRES_{t-1}\right) \quad (1)$$

In fact, the choice of indicators is justified by similar experiences in recent currency crises as well in emerging and developed countries, and attempts to detect early signs that meet the following observations:[54]

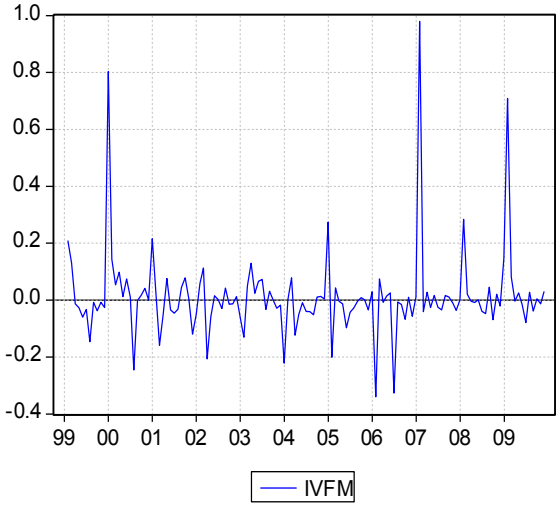
- ✓ A decline in credit triggers a financial accelerator mechanism that spreads to different markets (real estate, stock market and foreign exchange).
- ✓ Major fundamental imbalances and risks of macroeconomic overheating generally reflect excess credit, the overvaluation of the real exchange rate (and thus the misalignment), dwindling foreign-exchange reserves, excessive monetary growth leading to a sharp decline in interest rates and current-account deficits.
- ✓ A country permanently recording a current-account deficit cannot fund it with foreign capital inflows. If international financial markets believe that the deficit is unsustainable, the country becomes

[53] The nominal interest rate is defined as the average money market rate. The real effective exchange rate is calculated using the methodology developed by Mouley (2011).

[54] With reference to theories of currency crises of the first and second generations.

insolvent, which increases the probability of a crisis. In the same vein, the imbalances are also the result of unsustainable macroeconomic policies (expansionary monetary and fiscal policies that stimulate a strong credit growth, the accumulation of debt and over-investment in real assets).

✓ Subsequently, a policy tightening to maintain inflation and adjusting foreign positions led to a slowdown in economic activity, difficulties in servicing debt and increasing bad loans threatened the capital position of banks.



The graph above shows that the index detected three peaks of currency crises in the Tunisian economy. The unit root tests (Augmented Dickey-Fuller, ADF) show that the index is stationary I (0) at both absolute level and at the first derivative at 1% level (Table 5.3).[55]

Table 5.3 ADF unit root test of the continued crisis index

	Level	**First derivative**
Model with constant		
ADF test statistic	-10.7650	-18.4734

[55] In addition, normality tests show that the index follows a normal distribution.

VC (1%)*	-3.4815	-3.4819
VC (5%)	-2.8837	-2.8838
VC (10%)	-2.5784	-2.5785
Order of integration		
Model with constant and trend		
ADF Test Statistic	-10.7323	-18.4036
VC (1%)*	-4.0309	-4.0314
VC (5%)	-3.4447	-3.4450
VC (10%)	-3.1469	-3.1471
Order of integration	**I (0)**	**I (0)**

* MacKinnon's Critical Values for rejecting the null hypothesis of unit root.

Table 5.4 Descriptive statistics of the continued crisis index

Average	0.013223
Median	-0.003431
Maximum	0.979374
Minimum	-0.339959
Standard deviation	0.154172
Skewness	3.448642
Kurtosis	21.30695
Jarque-Bera	2088.997
Probability	0.000000
No. of observations	**131**

In addition, although the determination of the crises periods for Tunisia is insensitive to changes in definition of the term of crisis,[56] there

[56] The same graphical results are indeed obtained with two different alternative definitions:

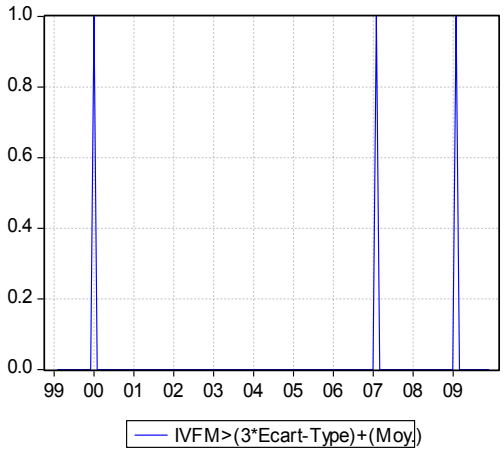
$$\begin{cases} IVMF = \frac{1}{\sigma_{CREDEC}} \cdot \left(\frac{CREDEC_t - CREDEC_{t-1}}{CREDEC_{t-1}} \right) - \frac{1}{\sigma_{ITCER}} \cdot \left(\frac{ITCER_t - ITCER_{t-1}}{ITCER_{t-1}} \right) \\ - \frac{1}{\sigma_{RES}} \cdot \left(\frac{RES_t - RES_{t-1}}{RES_{t-1}} \right) \end{cases}$$

$$\begin{cases} IVMF = \frac{1}{\sigma_{CREDEC}} \cdot \left(\frac{CREDEC_t - CREDEC_{t-1}}{CREDEC_{t-1}} \right) - \frac{1}{\sigma_{ITCER}} \cdot \left(\frac{ITCER_t - ITCER_{t-1}}{ITCER_{t-1}} \right) \\ + \frac{1}{\sigma_{DEFC}} \cdot \left(\frac{DEFC_t - DEFC_{t-1}}{DEFC_{t-1}} \right) \end{cases}$$

might be differences in terms of standard deviations. Setting a high threshold minimises the likelihood of predicting a crisis where there is none, while the probability of not predicting an actual crisis decreases. To avoid these biases, dating crisis is identified when IVMF index exceeds a threshold equal to three standard deviations ($3.\sigma_{IVMF}$), plus the average for the entire reporting period (μ_{IVMF}):[57]

$$C_t = \begin{cases} 1 \xrightarrow{Si} IVMF \succ 3.\sigma_{IVFM} + \mu_{IVFM} \\ 0 \longrightarrow Sinon \end{cases} \quad (2)$$

This method appears optimal to detect the precise dates of crises and to minimise the probability of identifying crisis wrongly.



During the reporting period, three periods of currency crises seem to have hurt the Tunisian economy, as follows:

- ✓ The first in 2000, due to a significant increase in the current-account deficit during this year, partly due to the sharp rise in imported energy prices and the dollar appreciation, accompanied by an unprecedented growth in outstanding loans of around 13.1%.
- ✓ The second in 2007 as a result of excess liquidity in the banking system due to an autonomous expansion of liquidity, as well as a credit growth of 9.8% compared to an average of 6.1% during the

[57] This threshold seems optimal with respect to three other crisis levels in terms of standard deviations, namely $1{,}5.\sigma_{IVFM}$, $2.\sigma_{IVFM}$ and $2{,}5.\sigma_{IVFM}$, estimated for the sensitivity analysis of the datation on arbitrary crisis levels.

period 2004-06 with gross NPLs (% of total loans) of about 17.6%. Meanwhile, and in view of the macroeconomic-balance approach used by the repository CGER (Consultative Group on Exchange Rate Issues) of the IMF, the real effective exchange rate of the dinar was over-valued by 2.7% during this year.

- ✓ The third in 2009 as a logical consequence of the contagion effects related to the recent international financial and economic crisis and what it involved in the deterioration of the current-account deficit and dwindling foreign exchange reserves.

This analysis completes other attempts to analyse the financial crisis by academics and international organisations, presented in the table below.

Nature of the financial crisis	**Crisis periods**	**References**
Sovereign debt crisis	1991-92	Roubini et al. (2003)
Banking crisis	1988-89 1991-95	Caisse des dépôts et consignations (1998)
Systemic banking crisis	1991-94	Laeven & Valencia (2008)
	1991	Boyd et al. (2009)

5.2.2 Econometric methodology: A binomial Probit model

The monitoring framework (early warning system) is based on a binary Probit model that functions as a prevention tool.[58] For this, we transpose the index (IVFM) into a discrete qualitative variable (C_t), binomial (or binary) of occurrence of crisis, taking the value (1)[59] if the index is greater than $3.\sigma_{IVFM} + \mu_{IVFM}$ and (0)[60] otherwise. The econometric estimation

[58] But other binary models (binary Logit) or multinomial (multinomial Logit) are also used in the literature. In particular, a multinomial approach taking into account two or more levels of financial distress reduces the number of false alarms and assist banking supervisors to decipher the characteristics of a looming crisis. In the work of Bussière & Fratzscher (2006), devoted to currency crises, there are a 'quiet' period (no crisis), a 'pre-crisis' period, before the crisis period (rising risk of attack), a 'crisis' regime considering only the first year of the crisis (assumed date of onset of the crisis) and finally, a 'time of crisis' regime that considers the period following the first crisis year until quietness returns.

[59] Crisis regime.

[60] Non-crisis regime.

method then arises exclusively from a binomial Probit.[61] The binary options model or qualitative response model is used for estimating the probability of identifying crises. The Probit method uses a continuous distribution and exponential probability that allows moving from classical linear regression. This implies the use of the method of maximum likelihood. Instead of trying to minimise errors (which is the case of the method of least squares), it estimates the weights of the explanatory variables (x_i) to correctly predict and anticipate the binary dependent variable (C_t). Thus, the regression of the Probit method is as follows:

$$\Pr(C_t = 1 \mid X_t, \beta) = 1 - F(-X_t^{/}\beta) \tag{3}$$

Where, $X_t = \lfloor x_{i,t} \rfloor$ denotes the vector of (*i*) explanatory variables (x_t), (*F*) a cumulative distribution function, continuous and strictly increasing and (β) all parameters that seeks to estimate and reflect the impact of changes in the vector (*X*) on the probability of a crisis. The parameters (β) then measure the estimated sensitivities with respect to the probability of crisis variables. These sensitivities are estimated using the method of maximum likelihood. The likelihood function (*l*) is given by:

$$l(\beta) = Log\left[L(\beta)\right] = \sum_{t=1}^{n} Y_t Log\left[1 - F(-X_t^{/}\beta)\right] + (1 - Y_t) LogF(-X_t^{/}\beta) \tag{4}$$

a. The experimental protocol of early warning

The control system (monitoring) is based on a macroeconomic appropriate choice of crisis indicators that stems from both the theoretical and empirical literature but also the judgment.[62] The explanatory variables in the vector $X_t = \lfloor x_{i,t} \rfloor$ are selected from empirical economic and financial alert indicators designed on a monthly frequency,[63] in order to better capture the

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[61] In other cases, the variable quality can be trichotomic taking the value (1), (2) and (3). The econometric estimation method then follows either a multimodal or multinomial Probit or a Logit.

[62] See also Gonzalez-Hermosillo (1999) and Demirguc-Kunt & Detragiache (2005).

[63] Except for the data of certain economic variables, especially for the monthly series that is only available in annual or quarterly frequencies, like fiscal balances,

sudden and brutal nature of currency crises as well as the variance of economic and financial variables. The variables have a monthly frequency for the period from January 1999 to December 2009.

The existing literature on banking crises in early-warning models highlights the macroeconomic factors as the main factors of a banking crisis in developing countries.[64] However, it insists very little about the specific variables for the banking sector and the fragility process. For our part, we combine two levels of warning indicators. The first category of variables includes macroeconomic indicators, relying on macro-prudential indicators of sound financial systems published by the IMF (Evans et al., 2000 and Plihon, 2009). The second category is derived from the CAMELS[65] accounting ratios used to evaluate the financial conditions of a bank.[66] Moreover, our full analysis is advancing on a recent IMF indicators guide also used for dating exit strategies from unconventional monetary policy measures (see IMF, 2010).

At first, anchoring the theoretical underpinnings will take precautions for the optimal choice of the different early warning indicators.

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internal and foreign public debt, foreign direct and portfolio investment, current account deficits, etc. For this, we have adopted statistical procedures to interpolate and/or extrapolate the data as proposed in statistical programme Eviews 7.1 linear extrapolation, namely *Constant Match Average and Sum, Quadratic Match Average and Sum* and *Cubic Match Last*. It should be noted that we had similar results for both.

[64] The pioneering work of Demirguc-Kunt & Detragiache (1998, 2000, 2005), Hardy & Pazarbasioglu (1998), Caprio & Klingebiel (1996, 2003), Lindgren et al. (1996), Kaminsky & Reinhart (1999) and Eichengreen & Arteta (2000) used a binary Probit approach, and found that real and financial macroeconomic important variables when it comes to triggering international crises. With regard to emerging economies, such work generally concludes that the probability of a currency crisis is based on a high domestic credit growth and a high ratio of debt relative to reserves. On the other hand, the pro-cyclicality of credit fuelled by changes in terms of trade and the importance of non-performing loans are the main factors of banking crisis.

[65] C, Capital adequacy; A, Asset quality; M, Management; E, Earnings; L, Liquidity; and S, Sensitivity to market risk.

[66] Thus, we consider the capital ratio (equity + reserves/total assets, FPRP), the profitability ratio (net income/total assets, ROA) and financial profitability (net income/(equity + reserves) ROE) for the return on assets and finally several liquidity ratios: the liquidity ratio (liquid assets/total assets RSLB), total loans-to-total assets ratio (TCA), deposits-to-loan ratio (RCPD), deposits-to-assets ratio (DVA) and the ratio of total deposits to total assets (TDA).

Also, the gross selection adopts the following hierarchical tree table, broken down by modules and blocks of variables related to features of the international and domestic environment, which includes the real, public, money, banking, financial and foreign sectors and other leading economic indicators and international exogenous shocks:

b. Selection of early indicators and calibrations

The table below details the theoretical specification of the expected impacts of economic and financial early-warning indicators on the probability of a currency crisis $(C_t = 1|X_t, \beta)$. Similarly, the symbols of variables, sources and explanations of the changes made are also explained.

Economic and financial early warning indicators						
Platform and specifications of indicators			**Mnemonics, data sources and transformations (1999:01 – 2009:12)**			
Data Catalogue	**Theory and expected impact of progress indicators**	**Expected sign**	**Mnem. unit**	**Unit**	**Source**	**Explanations and transformations**
A. Device 1: International Environment						
A.1. International Monetary and Financial Environment Module						
A.1.1. Block: International exogenous shocks						
Terms of trade index – Eurozone	Deterioration (growth) in the terms of trade reduces (improves) foreign partners' export capacity and therefore weakens (resp. consolidates) the position of the balance of payments of the country, exacerbating (limiting) vulnerabilities and the likelihood of a crisis in the country.	**(-)**	ITEZE	Base level (2005:100)	DataStream IFS - FMI	The ratio is calculated by dividing the export prices by the import ones (2005: 100)
Terms of trade index – United States			ITEUS	Base level (2005:100)	DataStream IFS - FMI	
Terms of trade index – Japan			ITEJP	Base level (2005:100)	DataStream IFS - FMI	
Index of commodity prices	The increase (decrease) in the price of raw materials increases (reduces) the international transmission of imported inflation and thus weakens (strengthens) the balance of payments position of the country, exacerbating (limiting) vulnerabilities and the likelihood of a crisis in the country).	**(+)**	IPMP	Base level (2005:100)	DataStream IFS - FMI	IFS - World All Primary Commodities index IFS Index (2005:100)
A.1.2. Block: Short- and long-term international interest rates						
FED Funds rate in the US	A country is more vulnerable to a currency crisis if it is faced with rising international interest rates, as investors		TFFUS	%	FED	
EONIA - ECB			TEONIA	%	Eurostat	

(Eurozone) LIBOR - 3 months EURIBOR - 3 months Refinancing rates REFI - ECB (Eurozone)	may wish to reallocate their portfolios in favour of more stable and secure investment (capital flight). The home country can record net outflows and/or experience an increase in interest expense on foreign debt (*Source*: Theories of crises second generation).	**(+)**	LIBOR EURIBOR TREFIZE	% % %	Datastream Datastream Eurostat	ECB Key rate
A.1.3. Block: Spread on the financial markets						
LIBOR–OIS spread	An increase (decrease) in risk premiums or Libor spread denotes an increase (decrease) in liquidity risk, and therefore a precursor of instability (stability) Financial and increase (decrease) of counterparty risk on international interbank markets.	**(+)**	SLIBOIS	Basis Points	Datastream Haver Analytics	OIS data are not available before November 2003; we used therefore the proposed method in the Eviews 7.1 package for linear interpolation/ extrapolation, namely *Constant Match Average and Sum, Quadratic Match Average and Sum* and *Cubic Match Last*. It should be noted that each time we had similar results.
TED – Spread	An increase (decrease or shrinkage) of the TED-spread induces an increase (decrease) in liquidity risk.	**(+)**	TEDS	Basis Points	Datastream	TED - Spread measures the default risk on loans (CD: Credit Default) and therefore approximates the estimated probability of non-repayment of

						interbank loans.
A.1.4. Block: Volatility in the financial markets						
VIX index	Measuring volatility applied to the stock market index S&P 500.	**(+)**	IVIX	% Change in volatility	Bloomberg Finance LP Haver Analytics	Sustainable threshold is 20%. VIX series: http://fr.finance.yahoo.com/q?s=%5EVIX http://www2.standardandpoors.com/portal/site/sp/en/us/page.topic/indices_500vix/2,3,4,0,0,0,0,0,0,0,0,0,0,0,0,0.html
Vstoxx Index	On the European market, VStoxx index is equivalent to the VIX (the VStoxx measure expected volatility of the DJ EuroStoxx).	**(+)**	IVSTX	% Change in volatility	Datastream	Sustainable threshold is 20%
A.1.5. Block: Volatility in emerging markets						
EMBI (JP Morgan Chase & Co.) Global Index (Emerging Market Bond Index)	- Both indices assess liquidity risks in emerging markets. The EMBI index measures the volatility of the debt or obligations (Debt / bond volatility), while the MSCI index measures the volatility of equities (equity volatility). - The increase (decrease) in liquidity risk is measured by the increase (decrease) in risk premiums and volatility in all forms and media financing whether equity markets (MSCI) or debt (EMBI index bond issues).	**(+)**	EMBI	%	Datastream	Monthly change year-on-year
MSCI (Morgan Stanley Capital International) Emerging Market Index			MSCI	%	Datastream	Monthly change year-on-year

A.1.6. Block: Inflation						
HICP Eurozone			IPCHZE	%	Datastream	Monthly change year-on-year
ICP United States		**(+)**	IPCUS	%	IMF-IFS	
ICP Japan			IPCJP	%	IMF-IFS	
A.1.7. Block: Current account balances						
Eurozone	These indicators incorporate risks associated with accentuation of global imbalances at international level.		SCZE	% of GDP	UK Pocket Data Bank	The data is not available for a monthly frequency, we used the *Linear Match Last* (LML) statistical method in the Eviews 7.1. software package to transpose the data to a monthly frequency.
United States			SCUS	% of GDP	UK Pocket Data Bank	
Japan		**(+/-)**	SCJP	% of GDP	UK Pocket Data Bank	
A.1.8. Block: M2 / exchange reserves						
Eurozone			MRESZE	Level	Datastream IMF-IFS	
United States		**(+/-)**	MRESUS	Level	Datastream IMF-IFS	
Japan			MRESJP	Level	Datastream IMF-IFS	
A.2. International Real Environment Module						
A.2.1. Block: Gross public debt						
Eurozone			DPZE	% of GDP	Eurostat	The data is not available for a monthly frequency, we used the
United States			DPUS	% of GDP	Eurostat	
Japan		**(+)**	DPJP	% of GDP	Eurostat	

						Linear Match Last (LML) statistical method in the Eviews 7.1. software package to transpose the data to a monthly frequency.
A.2.2. Block: Real GDP Growth						
Eurozone			CPIBRZE	%	IMF-IFS	The real GDP growth is approximated by the year-on-year change IPI which is extracted from IFS (2005:100)
United States			CPIBRUS	%	IMF-IFS	
Japan		(-)	CPIBRJP	%	IMF-IFS	
A.2.3. Block: Output Gap						
Eurozone	The output gap provides an important determinant for the aggregate demand that is fundamental to detect inflationary movements due to increased demand.		OGZE	Level	Measured by the difference between actual GDP and potential GDP estimated by the Hodrick-Prescott filter	
United States			OGUS	Level		
Japan			OGJP	Level		
		(+)				
A. 3. Advanced international indicators module						
A.3.1. Block: Advanced international confidence indicators and sentiment						
Indicator of the US Conference Board (Consumer Confidence Index)	Leading index (or advanced) projected from a coincident index and a lagging index. There is also a composite index of leading economic indicators obtained from both the beige (or tan) book on current economic conditions in the United States, the Green book on the business climate and the Blue book on	(-)	CCIUS	%	Pollingreport.com	Monthly change year-on-year

	the monetary and financial conditions set by the Fed.					
Economic Sentiment Indicator (ESI) in the Eurozone (European Commission)		**(-)**	ESIZE	Level	Datastream	Quality composite indicator (limit: 100)
A.3.2. Block: International business climate indicators						
ISM Manufacturing PMI	- In general, an improvement in these advanced international indicators denotes a better understanding by the operators of the business climate, and therefore a high probability of recovery in economic activity and growth, contributing to consolidate the positions of the balance of payments, increased foreign demand for domestic exports and reduces the probability of crisis. - The indicator ISM Manufacturing PMI in the US is derived from the aggregation of the Empire State Manufacturing Index (the Fed of New York), the Philly FED Manufacturing Index (FED Philadelphia) and Chicago Manufacturing PMI. - The S&P Case-Shiller Composite 20 (Real estate) index in the United States - The leading index in Japan - The composite PMI for the euro area indicator is derived from a PMI of manufacturing and services in the countries of the euro EU-16 area. - The Business Climate Indicator "BCI"		ISMUS	Level	www.ism.ws	Quality composite indicator including the area code UMitch of the University of Michigan (benchmark: 50)
S&P Case-Shiller composite 20 (Real Estate) in the US		**(-)**	SPCSUS	%	macromarkets.com	Monthly change year-on-year
Japan's Leading Index			LIJP	(2005:100)	www.esri.cao.go.jp	
PMI Composite Eurozone			PMICZE	Level	Datastream	Qualitative composite indicator (threshold: 0)
Business Climate Indicator "BCI" for the Eurozone (European Commission)			BCIZE	Level	Eurostat	Qualitative composite indicator (threshold: 100)
CLI for the OECD area			ICAZOCDE	Level	Datastream OCDE DataBase	

the euro area (European Commission)					
A. 4: Module International stock market indices					
A.4.1. Bloc: International stock market indices					
CAC 40 (France)		CACFR		Bloomberg Finance LP	
				Haver Analytics	
DAX 30 (Germany)		DAXRFA		Bloomberg Finance LP	
			Change %	Haver Analytics	Monthly change year-on-year
Dow Jones (United States)	**(+/-)**	DJUS		Bloomberg Finance LP	
				Haver Analytics	
Nikkei 225 (Japan)		NKJP		Bloomberg Finance LP	
				Haver Analytics	
MSCI World Market Index (Morgan Stanley Capital International)		MSCIM		Datastream	
B. Device. 2: Domestic Environment					
B.1: Module domestic real sector					

Real GDP growth	- The attacks are usually preceded by periods of economic downturn. The growth of industrial production should then decrease the probability of crisis. - Real imbalance: risk of foreign debt, low quality of domestic investment		CRPIBTN	%	IMF-IFS	The real GDP growth is approximated by the monthly year-on-year change of the Industrial Production Index (IPI) (2005:100) and the usage of a measure of monthly GDP
Output Gap		**(-)**	OGTN	Level	Author	Measured by the difference between actual GDP and potential GDP estimated by the Hodrick-Prescott filter.
Terms of Trade Index	Growth in terms of trade strengthens the position of the balance of payments, thereby reducing the likelihood of crisis.	**(-)**	ITETN	Level	Author	Calculated by the ratios of the respective price indices of export and import (2005:100)
B.2.Module domestic monetary sector						
B.2.1. Block: Inflation and money supply						
Inflation	A high inflation rate indicates macroeconomic mismanagement resulting in higher domestic nominal interest rates, which creates a negative impact on the real and financial sectors. An increase in inflation is expected to increase the probability of a crisis. (*Source*: Les théories de crises de première et deuxième générations)	**(+)**	INFTN	Change (%)	BCT	The inflation rate refers to monthly year-on-year change in inflation. It is calculated from the monthly consumer prices indices (2005:100)
M2 / Exchange	This ratio measures the ability of a		MRESTN	Level	BCT	

reserves	central bank to deal with a speculative attack. In case of a currency crisis or banking crisis, depositors are flocking to the bank to exchange their currency holdings home against foreign currency. An economy is more vulnerable to a crisis if the ratio of the money supply on the stock of reserves is high.	**(+)**				
B.2.2. Block: Monetary policy instruments						
Real interest rate		**(+/-)**	TINR	En %	BCT	Calculated by deflating the nominal interest rate by the inflation rate
B. 3. Module foreign sector and capital flows						
Misalignment of the real effective exchange rate	An overvaluation of the real effective exchange rate, firstly, attracts foreign capital rather short term, contributes to overheating of the domestic economy and, on the other hand, reduces the price competitiveness compared commercial competitors, resulting in a trade deficit. Overvaluation would imply an increase in the probability of a crisis. - Overvaluation of the real exchange: synonymous with disabilities future competitiveness and capital flight distortion.	**(+)**	MTCER	(2005:100)	Author: Estimated using the CGER and FEER methodology	
Foreign short-term debt/foreign exchange reserves	A high ratio of short-term foreign debt to foreign exchange reserves increases liquidity risk (and insolvency) and thus induces a country's vulnerability to a		DRESTN	Level	BCT	The data is not available for a monthly frequency, we used the *Linear Match Last*

	speculative attack. The probability of attack increases in parallel with the increase in this ratio.	**(+)**				(LML) statistical method in the Eviews 7.1. software package to transpose the data to a monthly frequency.
Short-term foreign debt/export receives	Debt: dwindling foreign exchange reserves, liquidity risk and speculative attack	**(+)**	DREXPTN	Level	BCT	
B.4. Module Soundness Indicators (and / or fragility) of the banking and financial system						
B.4.1. Block: Robustness factors						
Liquidity ratio		**(-)**	RLBTN	%	BCT	Liquidity ratio: Liquid assets to liquid liabilities. The data is not available for a monthly frequency, we used the *Linear Match Last* (LML) statistical method in the Eviews 7.1. software package to transpose the data to a monthly frequency.
NPL (Non-Performing Loans)		**(+)**	NPLTN	%	BCT – IMF - WB	Monthly NPL rate is calculated by the ratio of nonperforming loans to total loans. This ratio replaces two conventional ratios of gross NPLs (% of total loans) and gross NPLs (% of total assets)
B.4.2. Block: Outstanding loans						
Total loans/Total deposits of the	The ratio of bank loans to bank deposits demonstrates the link between the assets		CDSBTN	%	BCT	

banking system	and liabilities of the banking system. The increase in this ratio may indicate an increasing difficulty of the banking system to attract additional and/or an excessive growth of bank credit, which increases their non-performing loans. Following the increase of the ratio, the liquidity risk of the banking system in case of adverse shocks increases, so does the probability of a crisis (*Source*: Les théories de crises de première et troisième générations)	**(+)**				
Total bank deposits/M3 system	A high ratio of bank deposits to money supply indicates a growing investor confidence in the banking system. The probability of a crisis should then decrease due to an increase in this ratio.	**(-)**	DTMTN	%	BCT	
Mandatory reserves in the banking system/Assets total banking system	Traders perceive a decrease in the mandatory reserve ratio as a sign of weakness of the banking system, increasing the likelihood of a crisis. With a high reserve ratio, the banking system is rather fluid and generates a strong resilience to adverse shocks.	**(-)**	ROASBTN	%	BCT	Reserve requirements on a monthly frequency are approximated by ordinary banks' current account
B.4.3. Block: Quality of the portfolio and management						

Return on assets (ROA)	Profitability (RoA)	**(-)**	ROATN	%	BCT	The data is not available for a monthly frequency, we used the *Linear Match Last* (LML) statistical method in the Eviews 7.1. software package to transpose the data to a monthly frequency.
Return on equity (ROE)	Financial profitability or equity (RoE)	**(-)**	ROETN	%	BCT	
B.4.4. Block: Active seigniorage						
Advances from the central bank to the banking system / total liabilities of the banking system	This ratio shows the share of loans from the central bank to liabilities in the banking sector. An increase in this ratio, indicates a more sizeable bailout by the Central Bank of banks in financial difficulties (bank liquidity), should increase the probability of a crisis. It is generally interpreted as a proxy for moral hazard.	**(+)**	SEIGTN	Level	BCT	Advances from the central bank to the banking system affect the refinancing.
B.4.5. Block: Soundness Indicators (and / or vulnerability) of the financial system						
Stock index – Tunindex	The collapse of the stock market index, which shows the massive withdrawal of capital, can be seen as a sign of vulnerability or early signs of a crisis. In addition, these indicators can be integrated into the platform of financial asset prices and thus to measure the risk of pro-cyclicality in the financial market.	**(+/-)**	TUNINDEX	Change (%)	BVMT - BCT	Monthly change year-on-year

c. Correlation matrices

Given the large number of potential explanatory variables and to overcome the problems of multicollinearity, we use a process variable selection based on correlation matrices. Thus, the previous gross platform is purged of redundancies related to the risk of multicollinearity among the variables used:

- ✓ Strong correlations are evident between international warning indicators for business climate, confidence and sentiment. This is the case between the composite PMI for the euro area (PMICZE), the business climate indicator in the same area (BCIZE), the Economic Sentiment Indicator (ESIZE) and advanced in the OECD area (ICAZOCDE) composite indicator, the last variable will be preferred. Similarly, the correlation between the indicator S&P Case-Shiller (SPCSUS) and the ISM manufacturing PMI in the United States (ISMUS) suggests retaining only the latter.

	ISMUS	**SPCSUS**	**PMICZE**	**BCIZE**	**ICAZOCDE**
ISMUS	**1.00**				
SPCSUS	0.84	**1.00**			
PMICZE	0.53	0.05	**1.00**		
BCIZE	0.54	-0.21	0.79	**1.00**	
ICAZOCDE	0.56	-0.19	0.91	0.89	**1.00**

Note: Because of their correlation coefficients, variables in bold are excluded from regressions.

- ✓ The expected relationship between the real GDP growth rate in each zone (CRPIBRJP, CPIBRUS, CPIBRZE and CPIBRTN) and their respective outputs gap correlation (OGJP, OGUS, OGZE and OGTN) suggests retaining them because of their importance for the aggregate demand determination, which is fundamental to assessing inflationary movements due to increased demand. Similarly, high correlations of outputs gaps in the United States and Japan with the euro area implies retaining only the latter.

	CPIBRJP	**CPIBRUS**	**CPIBRZE**	**CRPIBTN**	**OGJP**	**OGTN**	**OGUS**	**OGZE**
CPIBRJP	**1.00**							
CPIBRUS	0.89	**1.00**						
CPIBRZE	0.91	0.65	**1.00**					
CRPIBTN	0.51	0.48	0.61	**1.00**				
OGJP	0.75	0.53	0.57	0.39	**1.00**			
OGTN	0.34	0.23	0.34	0.89	0.41	**1.00**		

OGUS	0.67	0.87	0.51	0.34	0.84	0.32	**1.00**	
OGZE	0.72	0.51	0.93	0.51	0.91	0.48	0.78	**1.00**

- ✓ At the level of international short- and long-term interest rates, there is a strong correlation between the LIBOR and EURIBOR 3-month interest rates with EONIA (TEONIA) and REFI (TREFZE) of the European Central Bank, confirming that the latter plays a major role in channelling market expectations and the stance of monetary policy in the euro area. Similarly, the LIBOR is also used in the calculation of the spread with OIS.

	LIBOR	**EURIBOR**	**TEONIA**	**TREFIZE**
LIBOR	**1.00**			
EURIBOR	0.63	**1.00**		
TEONIA	0.61	0.96	**1.00**	
TREFIZE	0.59	0.97	0.98	**1.00**

- ✓ Due to the interdependencies of developments in the international environment, the correlations between the different levels of inflation (IPCH, IPCUS, IPCJP), current account balances (SCZE, SCUS, SCJP), public deficits (DPZE, DPUS, DPJP) and ratios of money supply relative to foreign exchange reserves (MRESZE, MRESUS, MRESJP) suggest retaining only the variables for the euro area, which is also justified because of the high cycle synchronisation with Tunisia. The same applies to the high correlation (0.83) between indices of the terms of trade in the United States and Japan (ITEUS, ITEJP) with that of the euro area (ITEZE).
- ✓ The interweaving of international stock markets involves retaining only the MSCI (Morgan Stanley Capital International) Index as is also justified by the following correlation matrix.

	MSCIM	**CACFR**	**DAXRFA**	**DJUS**	**NKJP**
MSCIM	**1.00**				
CACFR	0.87	**1.00**			
DAXRFA	0.87	0.93	**1.00**		
DJUS	0.92	0.77	0.76	**1.00**	
NKJP	0.85	0.79	0.81	0.75	**1.00**

- ✓ The same is true of the high correlation (0.87) between the VIX indicators (IVIX) and VSTOXX (IVSTX), which suggests keeping the European volatility indicator.

- ✓ Due to the strong correlation between the inflation rate and the real interest rate in Tunisia (-0.93), the inflation rate is favoured. This is also justified by the quasi-neutral interest rate policy during this period. Similarly, the expected (0.81) correlation between the ratio of short-term foreign debt to export earnings (DREXPTN) and its ratio to foreign exchange reserves (DRESTN) suggests retaining only the latter.
- ✓ The number of terms-of-trade indices (ITETN) in Tunisia and the money supply (M2) relative to international reserves (MRESTN) are strongly and negatively correlated (-0.74). These two variables capture the same information on foreign factors. One retains the variable ITETN instead of MRESTN, which is involved in more collinearity problems.
- ✓ The same reasoning is applicable to the various components of the CAMELS applied in Tunisia. ROA is retained and ROE is dropped. One can also split the liquidity ratios into two groups. Bankers have the first group of indicators more or less under control, including the liquidity ratio (RLBTN), calculated by the ratio of liquid assets to liquid liabilities, and the coverage ratio of loans-to-deposits (CDSBTN), calculated by the ratio of total loans to total deposits of the banking system. The second group of liquidity ratios is beyond the control of the bankers, and in particular the total deposits of the banking system reported in M3 (DTMTN). The CDSBTN and DTMTN variables are the only liquidity ratios that have a significant coefficient, when crossed with the dependent variable. Insofar as these two variables are competing, we chose the one whose contribution is most significant, the variable DTMTN.
- ✓ Finally, we used the refinancing rate of the ECB (TREFIZE) because of its correlation with the FED Funds rate in the US (TFFUS), as well as the EMBI indicator, which is highly correlated with the MSCI index, The Economic Sentiment Indicator for the euro area (ESIZE) is correlated with the Conference Board indicator for the United States (CCIUS) and the ratio of the money supply relative to foreign exchange reserves in the euro area (MRESZE) due to its correlation with the respective ratios of the current account deficit (SCZE) and public debt (DPZE) to GDP.

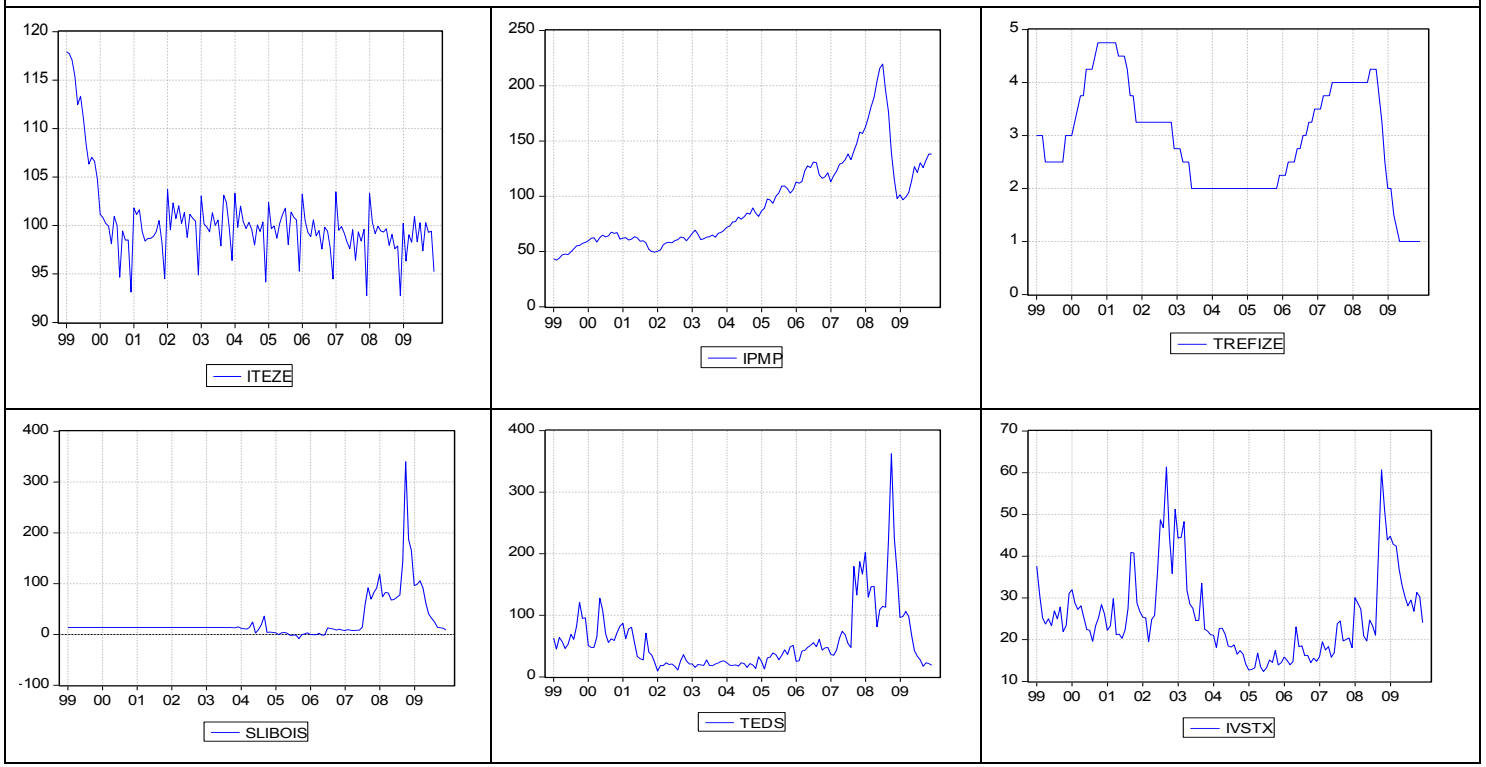
d. The selected variables and their statistical properties

In summary, only the following variables were selected for the econometric estimates. The final architecture of the system of early warning indicators is then derived from the following leading indicators:

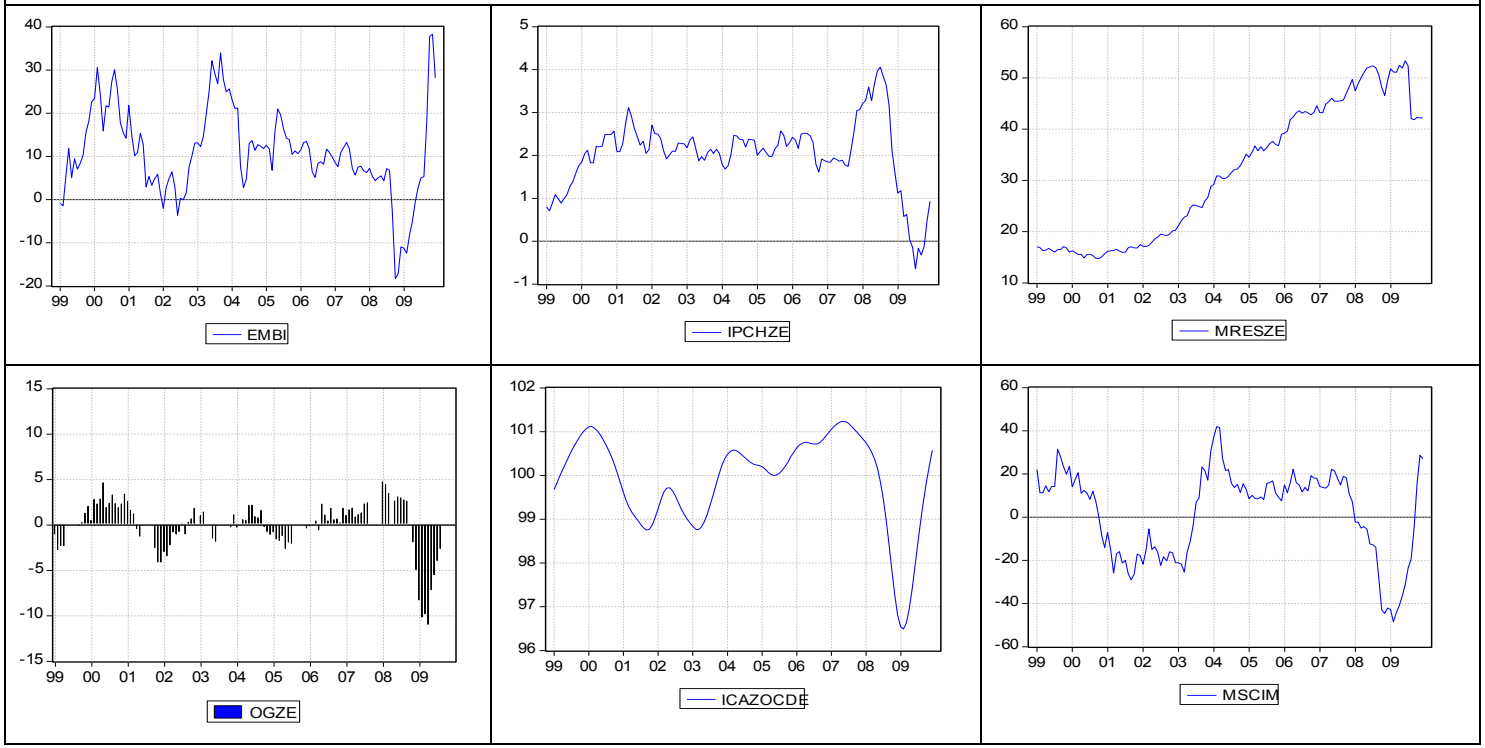
Order No.	Mnemonic	Descriptions
International environment		
1	ITEZE	Terms of trade index - eurozone
2	IPMP	Commodity prices index
3	TREFIZE	Refinancing rates REFI - ECB (eurozone)
4	SLIBOIS	Spread Libor – OIS
5	TEDS	TED – Spread
6	IVSTX	Indice Vstoxx
7	EMBI	EMBI (JP Morgan Chase & Co.) Global Index (Emerging Market Bond Index)
8	IPCHZE	HICP Eurozone
9	MRESZE	Money/currency reserves of the eurozone
10	OGZE	Output gap eurozone
11	ICAZOCDE	CLI for the OECD area
12	MSCIM	MSCI World Market Index (Morgan Stanley Capital International – Global Index)
National environment		
13	OGTN	Output gap
14	ITETN	Terms of trade index
15	INFTN	Inflation
16	MTCER	Misalignment of the real effective exchange rate
17	DRESTN	Foreign short-term debt/foreign exchange reserves
18	RLBTN	Liquidity ratio
19	NPLTN	NPL (Non-Performing Loans)
20	DTMTN	Total deposits of the banking system/M3
21	ROASBTN	Mandatory reserves in the banking system/total banking system assets
22	ROATN	Return on assets (ROA)
23	SEIGTN	Advances from the central bank to the banking system / total liabilities of the banking system
24	TUNINDEX	Stock Index – Tunindex

The changes in patterns of the leading indicators are presented in the following graphs:

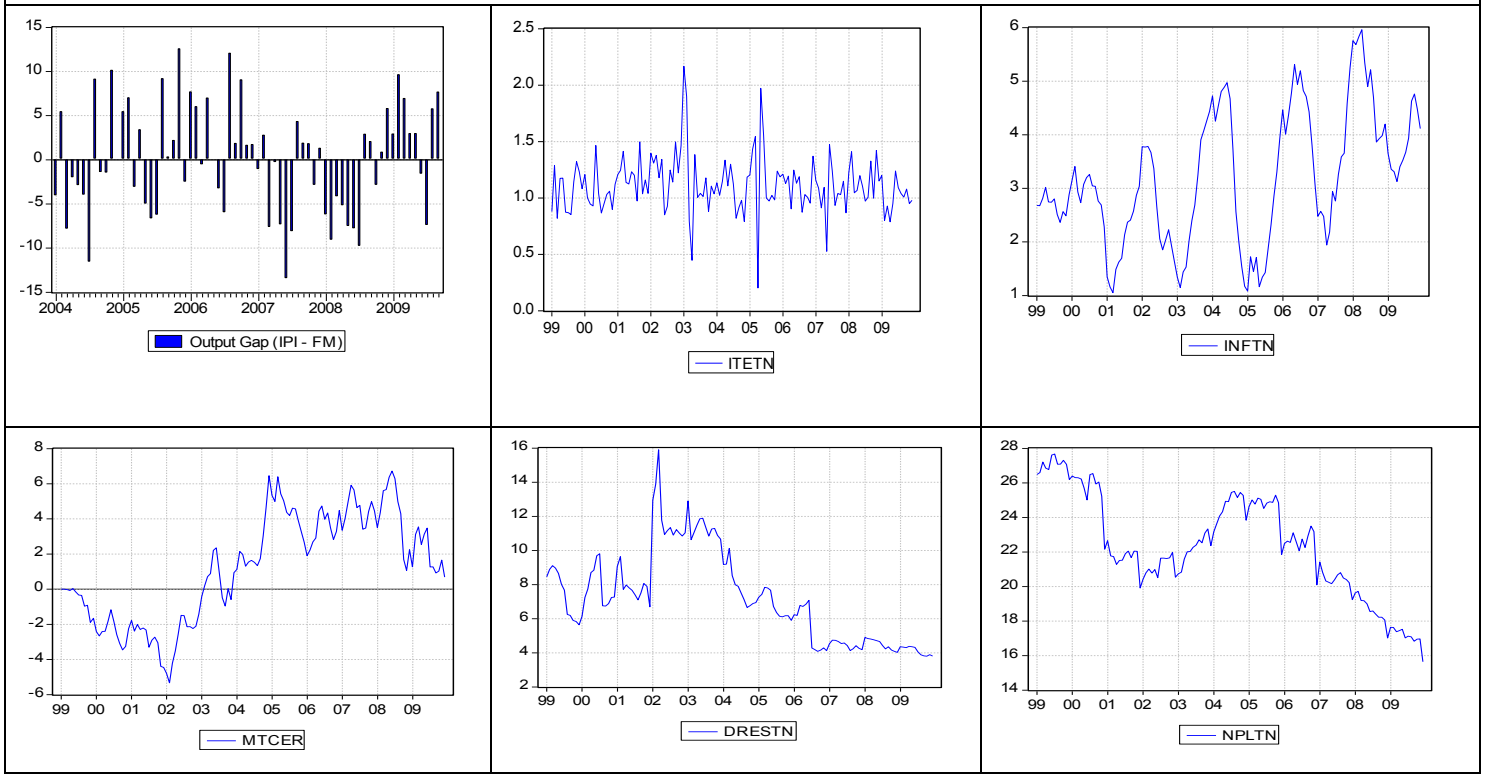
International environment indicators



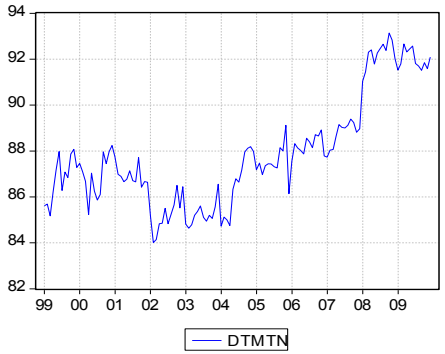
International environment indicators

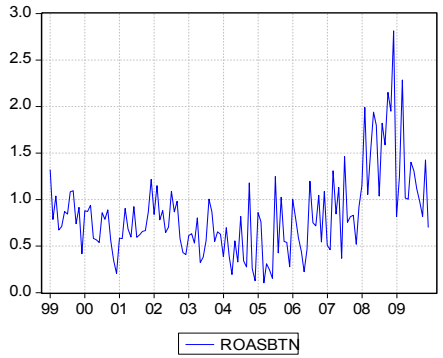


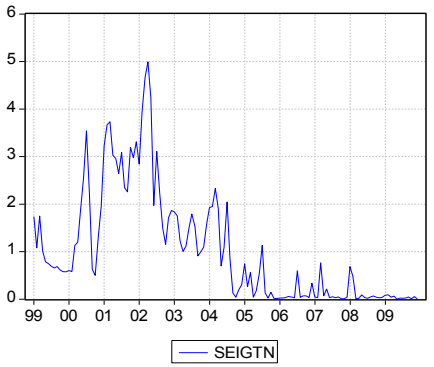
National environment indicators – Tunisia

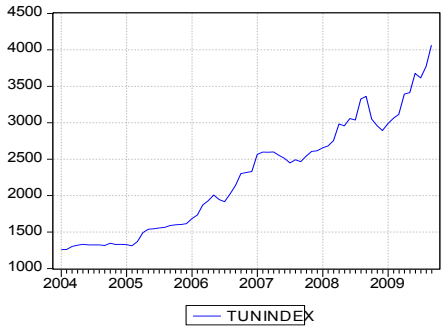


National environment indicators – Tunisia









In addition, the unit root tests (Augmented Dickey-Fuller, ADF) show that all the leading indicators used are stationary both in level and first derivative at the 5% or 10%.

5.2.3 Results of the econometric estimations

From leading indicators selected for both international and domestic environments, several iterations of econometric estimates of Probit models were made, first with individual indicators (in level and variation) followed by successive and separated blocks of variables in order to observe the statistical and economic significance. This 'back step' procedure, which consists of re-estimating the model by eliminating the least-significant variables, can help to optimise the robustness of the final model. The results of the estimates presented below clearly show that all the variables have the expected sign and are significant. The overall significance of the model and the quality of the estimates are traced by the McFadden coefficient of multiple determinants (R^2). Calculated using the method of maximum likelihood, this index normally has significantly lower values than those of (R^2) values obtained in a classical regression. McFadden noted that values close to 0.5 indicate a good model specification, which is the case of our estimation with a value of (0.354):

Estimated sensitivities Probit model

Estimation method: ML - Binary Probit		
Sample (adjusted): 1999:02 - 2009:12		
Number of observations: 131 after adjusting endpoints		
Variable	**Coefficient**	**z-Statistic**
ITETN	-7. 531219	-1. 954772
MTCER	4.565086	1.874175
NPLTN	6.355675	1.852281
SEIGTN	5. 924109	2. 930535
TREFIZE	1. 604010	2.814009
EMBI	0. 870160	1. 824012
ICAZOCDE	-1. 782442	-4.020373
	McFadden R-squared	**0.354722**

In addition to the Mc Fadden index of the likelihood ratio, the robustness of the model and the quality of the estimates are better analysed by the 'Expectation-Prediction-Table',[67] which allows us compare the actual structure of the observed binary choice with the choice structure predicted by the estimated model. Data on the estimated equation provide a discrete classification of the probability of a crisis based on the probability value *P (C = 1)* predicted by the model:

$$\hat{P} = P(C = 1) = 1 - F(-X_t^{/}\hat{\beta}) \leq Cut - Off$$
$$\hat{P} \succ C(Cut - Off) \tag{5}$$

In the literature on early warning systems there is no consensus on the choice of cut-off (or critical probabilities at which a supervisor issues a warning). In the case of in-sample prediction, Demirguc-Kunt & Detragiache (1998, 2000) suggest taking the unconditional probability of crisis whose seizure frequency in the sample is a proxy. By analysing the predictive ability of early warning indicators, Kaminsky & Reihnart (1999) advocate the noise ratio to minimum signal indicator. The table below provides an overview of the successful prediction of correct and incorrect classifications of the probabilities of the occurrence of a crisis (*C=1*) on the basis of a prediction rule that sets a cut-off value equal to a successful calibration (0.5).

Expectation-PredictionTable

Dependent variables: $IVMF \succ 3.\sigma_{IVFM} + \mu_{IVFM}$		
Estimation method: ML – Binary Probit		
	Estimated Equation	
	C=0	**C=1**
Sensitivities (% correct)	71.43%	93.33%
Sensitivities (% incorrect)	28.57%	6.67%
	100.00%	100.00%

The fraction of observations (C=1) are correctly predicted and classified by the model, which gives an actual occurrence of a crisis equal to

[67] For technical details, see Maddala (1983).

93.33% (with a default rate assigned to the model specification of 6.67%), against 71.43% for the opposite (with a default rate of 28.57%).

The early warning system (EWS) clearly indicates that the probability of occurrence of currency crises in Tunisia seems explained by the following nested mechanisms that policy-makers must anticipate for better early warning: i) a risk of deterioration of terms of trade, ii) a risk of over-appreciation of the real effective exchange rate, iii) a worsening of NPLs and incidentally iv) an excessive use of central-bank refinancing.

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6. BANKING POLICY IN THE SEMCS PRE- AND POST-CRISIS

RYM AYADI AND WILLEM PIETER DE GROEN

Southern and eastern Mediterranean countries (SEMCs) have undertaken substantial reforms in their financial sectors in recent years. The financial crisis has pressured the central banks of the majority of the countries to strengthen financial stability.

This chapter develops a number of indicators to track the evolution and assess the adequacy of banking regulations pre- and post-financial crisis using publicly available and comparable surveys for a large sample of countries since the early 2000s. To allow comparability across the Mediterranean, the report develops the measures for 10 SEMCs (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, Syria, Tunisia and Turkey) and seven EU Mediterranean countries (Cyprus, France, Greece, Italy, Malta, Portugal and Spain).

The aim is to develop quantitative measures of regulatory development to assess regulatory efforts over the years in general and in the pre- and post-financial crisis periods in particular. In line with Ayadi et al. (2011), seven distinct regulatory areas are identified for assessing the various dimensions of regulatory adequacy. These cover the definition of banking, licensing requirements, capital requirements, the independence and power of the supervisor, the presence of safety nets, disclosure and the availability of credit information using distinct data sources. All indicators are expected to be impacted by the financial crisis, but the most relevant one for assessing the impact of the crisis are the level of capital requirements, stringency of supervision and the presence of safety nets. In addition, a convergence analysis is undertaken between the SEMCs and the EU Mediterranean countries to assess whether there has been further regulatory convergence between the two regions pre- and post-crisis.

Generally, the analysis shows that the majority of the SEMCs have increased capital requirements, but they still suffer from key weaknesses in implementing necessary safety nets, such as deposit insurance. In addition,

entry obstacles, political interference and the strength of legal rights are still below international benchmarks.

The second section provides a description of the methods and data used. In the third section, quantitative measures are presented and discussed. Based on the results, conclusions and policy recommendations are drawn in the fourth section.

6.1 Methodology

The main source of information for the regulatory adequacy indices are the Bank Regulation and Supervision Surveys (henceforth the 'BRSS') developed by Barth et al. (2001), later revised in 2003, 2007 and 2011.[68] All four surveys are built on official responses to questionnaires that were sent to the national regulatory and supervisory agencies of over 120 countries, most of which were returned.[69] The questions cover a wide variety of areas, including banking activity, entry, capital regulations, supervisory authority, private monitoring, deposit insurance and external governance. The responses from the BRSS database served as the basis for our analysis and were verified and in some cases completed by semi-structured interviews with the regulatory authorities in the countries we analysed.[70] We then constructed and assessed all indicators pre- and post-crisis.

One of the key advantages of the BRSS is that the questionnaires have remained relatively similar over the years, although the later versions cover more areas than the original survey. This particular feature of the datasets allows us to make comparisons by building composite indices based on specific answers over time to track the evolution of the different regulatory and supervisory elements.

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[68] For the discussion of the results and other aspects of the data, see Barth et al. (2006, 2008 and 2012).

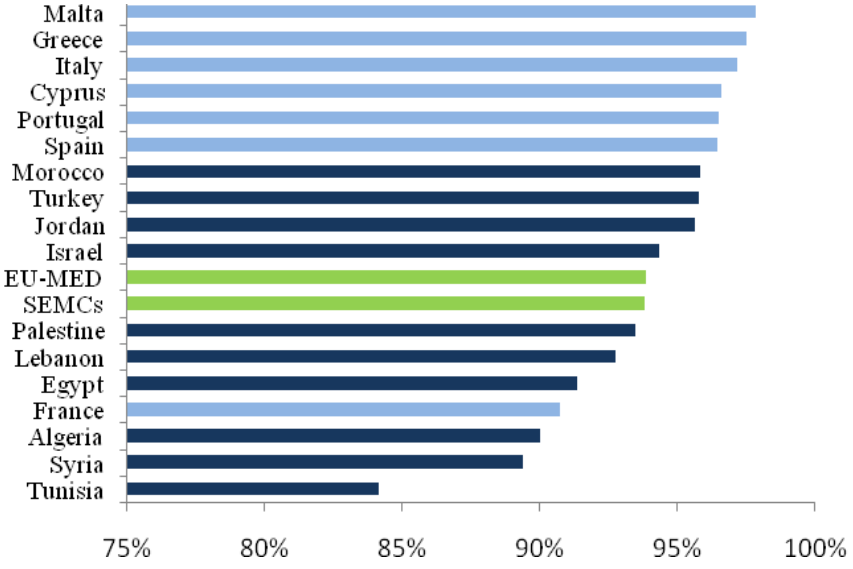
[69] The number of countries responding to the survey varied over time. The original survey of Barth et al. (2001) had 117 country respondents, including a wide diversity of developed, developing and underdeveloped countries. The later surveys achieved greater participation, with 152 in 2003, 142 in 2007 and 125 countries participating in 2011.

[70] The interviews were mainly semi-structured and aimed specifically at assessing the impacts of the financial crisis on bank regulation, supervision and financial stability. The results and conclusions complemented the background analysis on the basis of BRSS.

A key disadvantage of the Barth et al. (2001) survey is that the number of questions responded to in the 2003, 2007 and 2011 revisions vary from one country to another. For the Mediterranean countries, the aggregate response rates are generally lower than for the entire sample. As noted in Figure 6.1, among the SEMCs, the Moroccan regulatory authorities were the most responsive to the survey, with an average response rate above 95%. In contrast, three SEMCs – Algeria, Syria and Tunisia – had response rates of between 83% and 90%, which is well below the average rate for the Mediterranean countries.

Although the response rates appear high in general, the existence of a single partial or empty answer renders the construction of a relevant composite index dubious, since there is no clear way of scoring for missing responses. Moreover, some countries, such as Algeria, Palestine, Syria, Tunisia and Turkey, have not responded to all four surveys. Palestine only responded to a single survey (the 2011 survey), Algeria (2003, 2007), Syria (2007, 2011) and Tunisia (2003, 2011) to two surveys and Turkey (2000, 2003, and 2011) to three surveys. To avoid any inconsistencies, empty answers were scored as zero in the construction of the relevant indices. This approach is in line with Barth et al. (2006, 2012). To complete the analysis based on the BRSS, qualitative surveys (in the form of semi-structured interviews with regulatory authorities) have been undertaken to allow some expert judgments on the regulatory initiatives taken in response to the financial crisis.

Figure 6.1 Average response rates to the BRSS of Barth et al., by country



Note: Response rates are averaged over the four surveys and correspond to the number of questions with complete answers (i.e. all empty or partial were excluded) divided by the total number of questions used to compute the composite indices presented in this report.

Source: BRSS.

A second disadvantage of Barth et al. (2001) and its subsequent versions is that the questions did not cover all regulatory and supervisory areas. Two major areas where the surveys lacked depth were the details on deposit insurance guarantee schemes and institutional variables, such as the extent of credit information-sharing and creditors' legal rights. To fill the gap, several additional sources were used to supplement the construction of the composite indices, including the deposit insurance database of Demirgüç-Kunt et al. (2005), the IMF and World Bank's Financial Sector Assessment reports, the World Bank's Doing Business Indicators and the websites of the national authorities and direct questions in these areas to the interviewees.

6.2 Composite indices

Seven composite indices have been created using the various data sources identified above:

1) Scope restrictions
2) Entry obstacles
3) Capital requirement stringency
4) Supervisory authority
5) Deposit insurance
6) Private monitoring
7) Credit information and laws

These areas provide relatively broad coverage of the quality and evolution of banking regulation and supervision pre- and post-crisis. The composite indices have been calculated for each country and also for the SEMCs and EU-MED countries included in our sample.

The following sections revise and compare the evolution of the regulatory conditions in each of these seven areas.

6.3 Scope restrictions

As is evident from the differing business models of financial institutions across the world, financial institutions are becoming increasingly complex and offering a wider spectrum of products. Some countries restrict banking to a narrow range of activities, such as taking deposits and issuing credit

with little flexibility in debt and asset management, while others provide more flexibility allowing them to make investments and conduct retail banking and insurance activities. The regulations typically restrict the extent to which banks may engage in the business of i) securities underwriting, brokering, dealing and all aspects of the mutual fund industry; ii) insurance underwriting and selling; and iii) real estate investment, development and management. In a crisis context, scope restrictions are expected to increase as was clearly shown by the recently renewed debate on the reintroduction of the Glass–Steagall Act in the US.

The composite indicator used in this area to assess the extent of restrictions imposed on banking activity is based on the Banking Activity Restrictiveness Index in the BRSS.[71] The surveys provide measures of the degrees of restrictiveness for each of the above four categories, ranging from unrestricted (1 point), mostly permitted (2 points) and too restricted (3 points) to fully prohibited (4 points). The Banking Activity Restrictiveness Index sums up the scores for each category to come up with a measure of the extent to which restrictions are present for banks, with a maximum restrictiveness score of 12 points, where no activity other than narrow banking is allowed.

The country-specific results summarised in Figure 6.2 and Table 6.1 show that the regulators in the SEMCs impose more restrictions on the scope of activities than the EU-MED countries in general during the pre- and post-crisis periods. A deeper analysis of the survey results (not included here) shows that in both the SEMCs and the EU-MED countries, regulators impose some form of restriction on insurance activities. Israel and Jordan's banks face high restrictions among the sampled countries, where all real estate activities and some securities and insurance activities are prohibited. This is largely in line with Turkey's banks, although the latter have only to deal with a few restrictions in order to engage in securities activities, and Syria's banks, which are prohibited from engaging in both insurance and real estate activities, but on the other hand have complete freedom to engage in securities activities. Morocco's banks are similarly restricted in their activities, but are to a limited extent allowed to engage in insurance activities.

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[71] The Banking Activity Restrictiveness Index is constructed by summing up the scores for the World Bank Guide (WBG) questions 4.1-4.3, as detailed in Appendix 2 of Barth et al. (2006).

Figure 6.2 Banking activity restrictiveness, by region (% of maximum score)

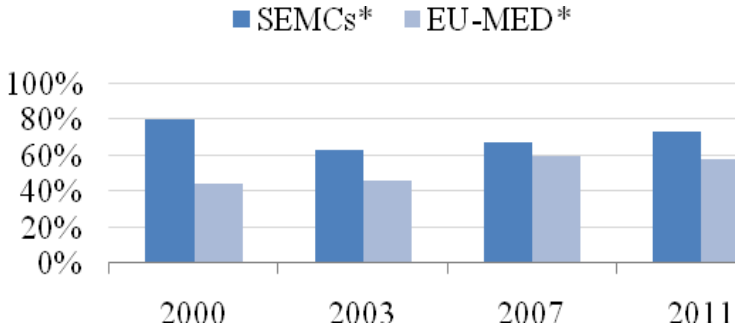

Table 6.1 Banking activity restrictiveness, by country and region (% of maximum score)

	2000	2003	2007	2011
Algeria	..	42	50	..
Egypt	83	58	58	67
Israel	83	83	75	83
Jordan	67	50	67	83
Lebanon	75	67	75	58
Morocco	83	58	75	67
Palestine	..	..	..	42
Syria	..	..	67	75
Tunisia	..	67	..	50
Turkey	75	50	..	75
SEMCs*	80	63	67	73
Cyprus	42	67	67	58
France	33	33	58	67
Greece	58	67	50	50
Italy	58	67	75	58
Malta	58	67	67	67
Portugal	50	58	75	42
Spain	50	42	42	42
EU-MED*	44	46	59	58
AVG	47	47	59	59
STDEV	14	15	12	11

* Regional averages are weighted by total banking assets.

Note: Higher values represent more restrictive rules, with a maximum score of 12 points.

Source: BRSS.

Algerian banks are prohibited from engaging in insurance activities, but have complete freedom to engage in securities and real estate activities. In contrast, Palestine's banks have complete freedom to engage in insurance activities and face fewer restrictions in both securities and real

estate investment activities. Lebanon's banks are prohibited from engaging in real estate activities yet they have a large degree of freedom to engage in insurance and securities activities. Egypt imposes some restrictions on insurance and real estate, largely comparable with the EU-MED countries. It is not possible to judge the changing conditions in Tunisia owing to the incompleteness of information. Turning to the EU-MED countries, the banks in general face fewer restrictions than most of their neighbours. All EU-MED banks have complete freedom to engage in securities activities. Moreover, Spanish, Portuguese and Greek banks are also less restricted from engaging in insurance and real estate activities. Still, Cypriot and Maltese banks are prohibited from engaging in real estate activities and French banks in insurance activities.

The figures show that there is a convergence tendency when the regional weighted averages are considered during the pre- and post-crisis period. Indeed, while the EU-MED countries' weighted averages have moved up the restriction in this area gradually over time, the SEMCs' averages have slightly gone down, converging to the former. However, there are clear differences within each sub-region. For example, Israel and Jordan impose substantial restrictions while Palestine has the most flexible system. As for the EU-MED countries, Spain's system imposes the least amount of restrictions, while France and Malta have increasingly narrowed the scope of banking activities over the years. This EU-MED trend may change as a result of the new banking reforms that are moving towards more restrictions on banking activities as a result of the financial crisis.[72] This might bring convergence to a higher level with the SEMCs, if these countries do not change the level of activity restriction.

6.4 Entry obstacles

The competitive conditions in a country depend crucially on the regulatory structures and conditions that might hinder or prevent entry into the banking sector by domestic or foreign banks. In some countries, the obstacles may take the form of excessive licensing or entry requirements, which are applicable to domestic and foreign banks alike. In others, the

[72] In 2012, Commissioner Michel Barnier nominated a group of experts chaired by Erkki Liikanen to examine the need for reforms in the structure of the EU's banking sector. In the final report published in October 2012, the experts advised the European Commission among other things to curb excessively risky investment banking activities.

governments may restrict foreign entry as part of a conscientious policy choice, either explicitly by setting limits on ownership or more importantly by rejecting foreign applications in a disproportionate manner.[73] Lastly, a banking sector that is predominantly state-owned may be disadvantageous for the development of privately owned banks.[74]

The first indicator that comes to mind for measuring how much the regulatory structure obstructs entry is legal licensing requirements, which may hamper entry by making the procedures unnecessarily cumbersome. Entry obstacles are expected to be more pronounced in a crisis context.

The relevant measure is based on the set of requirements for the licensing application to be considered valid. The index is built on the total number of required documents, including i) draft by-laws, ii) an organisational chart, iii) financial projections, iv) financial information on potential shareholders, v) the background of directors, vi) the background of management, vii) details of funding sources and viii) market differentiation intended.[75]

Figure 6.3 and Table 6.2 show that most SEMCs impose levels of stringency in terms of entry requirements that are similar to those of EU-MED countries. These requirements have increased since the eruption of the financial crisis both in the EU-MED countries and SEMCs. In particular, all of the eight requirements named above are commonplace in all ten SEMCs for which the latest survey was completed. As for the EU-MED countries, almost all of them require all eight documents. Only Greece and

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[73] Denials of domestic banks are not considered here as they are more likely to arise from prudential concerns, including funding deficiencies or other financial problems, which are commonplace for home-grown banks in countries with less developed financial systems that have limited access to external capital.

[74] Aside from their potentially negative impact on entry, state-owned banks may fulfil an important developmental role in under-developed regions. Recent evidence shows that in the Middle East and North Africa (MENA) region, public banks compensate for the low private-bank involvement in the small- and medium-sized enterprise (SME) sector, engaging in more risky loan issuance, although they seem to have less than sufficient capacity to manage such risks (Rocha et al., 2010). See also Andrianova et al. (2010) for recent evidence that government ownership of banks is associated with higher long-run growth rates in developing countries.

[75] The entry in the banking requirements index is constructed by summing up the scores for the WBG questions 1.8.1-1.8.8, as detailed in Appendix 2 of Barth et al. (2006).

Portugal do not legally require banks to provide information on the background of future managers.

Figure 6.3 Requirements for entry into the banking sector, by region (% of maximum score)

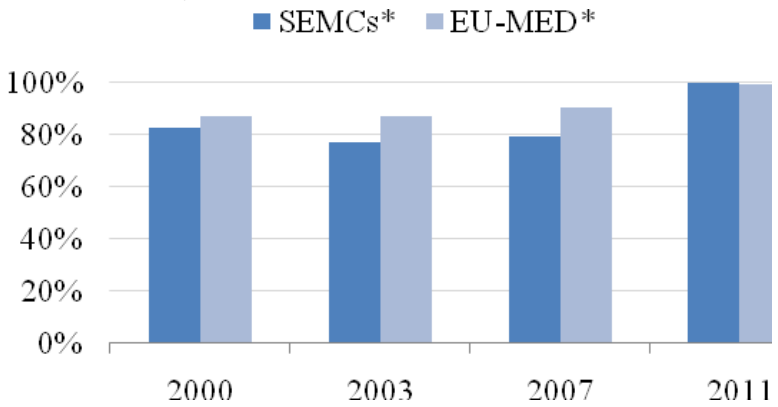

Table 6.2 Requirements for entry into the banking sector, by country and region (% of maximum score)

	2000	2003	2007	2011
Algeria	..	88	100	..
Egypt	75	100	100	100
Israel	75	38	38	100
Jordan	100	88	100	100
Lebanon	100	100	100	100
Morocco	100	100	100	100
Palestine	..	..	..	100
Syria	..	..	100	100
Tunisia	..	100	..	100
Turkey	88	88	..	100
SEMCs*	83	77	79	100
Cyprus	100	75	38	100
France	75	75	88	100
Greece	100	88	88	88
Italy	100	100	100	100
Malta	100	100	100	100
Portugal	88	88	88	88
Spain	100	100	88	100
EU-MED*	87	87	90	99
AVG	87	86	90	99
STDEV	12	14	9	3

* Regional averages are weighted by total banking assets.

Note: Higher values represent more restrictive rules as a share of a maximum of 8 points.

Source: BRSS.

These results show that most countries in the Mediterranean require similar documents for licensing. This means that these figures probably give at best an incomplete picture of the obstacles faced by potential entrants. More realistically, these requirements are most likely used on both sides of the Mediterranean to screen potential entrants, ensuring that they are 'fit and proper' to run a banking business.

As noted above, the set of licensing requirements do not paint a complete picture of entry obstacles. The second index considers the more discretionary power that the authorities enjoy by granting or rejecting entry. More specifically, the index is based on the fraction of licensing applications for foreign banks that have been denied within the past five years from the day the survey was conducted.[76]

Figure 6.4 and Table 6.3 clearly show that denials of foreign banking applications are more commonplace in the SEMCs, which is in stark contrast to the EU-MED countries, where such denials are very rare. In particular, all of the licensing applications for foreign banks for the years between 1995 and 2002 were denied in Egypt. More recently, Egypt denied nearly a third of the foreign licensing applications (four out of five) in the five years leading to 2011. Jordan denied two of the four applications over the same period. Turkey also refused two of the fifteen foreign applications. Israel and Morocco denied several foreign banking applications in the past, but none of the five applications was denied in the last observation period of 2006 to 2010. Algeria, Lebanon, Palestine, Syria and Tunisia do not appear to use foreign denials as an entry obstacle. Overall, the percentage of foreign denials in the SEMCs has decreased gradually since 1995 and the trend is decreasing after the financial crisis.

[76] The share of foreign denials are addressed by WBG question 1.10, as detailed in Appendix 1 and 2 of Barth et al. (2006).

Figure 6.4 Share of foreign applications denied, by region (%)

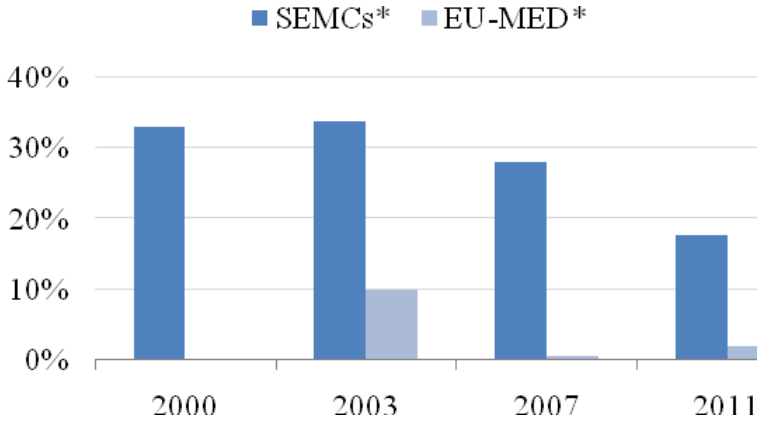

Table 6.3 Share of foreign applications denied, by country and region (%)

	2000	2003	2007	2011
Algeria	..	0	..	..
Egypt	100	100	32	80
Israel	0	17	20	0
Jordan	..	80	90	50
Lebanon	0	0	0	0
Morocco	..	0	50	0
Palestine	..	..	..	0
Syria	..	..	0	0
Tunisia	..	0	..	0
Turkey	..	42	..	13
SEMCs*	33	34	28	18
Cyprus	0	0	0	20
France	0	..	0	0
Greece	0	14	0	0
Italy	0	13	3	9
Malta	0	0	0	0
Portugal	0	0	0	0
Spain	0	7	0	0
EU-MED*	0	10	1	2
AVG	2	13	2	3
STDEV	13	15	6	10

* Regional averages are weighted by total banking assets.

Source: BRSS.

The third and last indicator on entry obstacles relates to the dominance of government-controlled banking. The index is a simple

measure of the market power of banks that are majority-owned by the state, i.e. the percentage of total banking assets controlled by the government-owned banks (e.g. the government possesses more than 50% of the bank's equity).[77] The relevant data are available for the 2003, 2007 and 2011 surveys.

Figure 6.5 and Table 6.4 point at significant differences between SEMCs and the Euro-Med countries. While the state has little control over banking in the EU-MED countries, except for Greece and Portugal, public banks represent a significant part of the banking activity in the SEMCs. This remains particularly the case for Algeria, Egypt and Syria, where the state has control over a significant majority of the banking sector. State-owned banks in these countries often enjoy implicit or explicit state guarantees, with access to public funding, and are possibly subject to less strict or to flexible rules, which may represent a disadvantage for potential entrants and more generally undermine healthy competition (Barth et al., 2004). Since 2007, the trend of state ownership in banks seems to be decreasing, which might open new opportunities for competition.

Figure 6.5. Market share of government-controlled banks, by region (% of total assets)

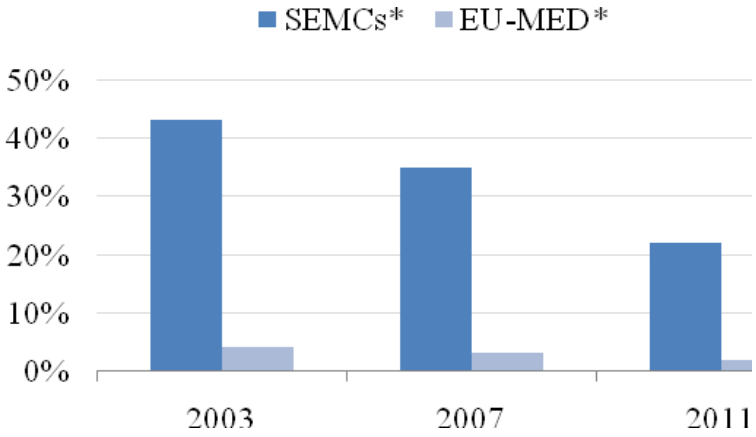

Table 6.4 Market share of government-controlled banks, by country and region (% of total assets)

	2003	2007	2011
Algeria	96	90	..

[77] The share of government-controlled banks is addressed by WBG question 3.8.1, as detailed in Appendix 1 of Barth et al. (2006).

Egypt	65	67	..
Israel	46	0	0
Jordan	0	0	..
Lebanon	2	..	..
Morocco	35	29	..
Palestine	..	..	0
Syria	..	..	71
Tunisia	43	..	..
Turkey	32	..	32
SEMCs*	43	35	22
Cyprus	4	3	1
France	0	0	2
Greece	23	..	11
Italy	10	9	0
Malta	0	0	0
Portugal	23	25	23
Spain	0	0	0
EU-MED*	4	3	2
AVG	7	4	3
STDEV	13	10	8

* Regional averages are weighted by the total banking assets.

Notes: Figures represent share of banks with at least 50% state ownership.

Source: BRSS.

Put together, the three indices provide a contrasting picture of the sampled countries in terms of entry obstacles. The sets of documents needed for a valid licensing application are largely similar on both sides of the Mediterranean and have even been strengthened in the post-financial crisis period. These requirements are most likely used to ensure that only 'fit and proper' undertakings are allowed to operate as banks. Only two countries, Greece and Portugal, can be distinguished in this respect, with few licensing requirements. Turning to less official controls that the authorities exert on the banking sector, foreign entry denials are proportionally high in some of the SEMCs, particularly in Egypt and Jordan. The state also maintains substantial direct control over the banking sector in most of the countries in the region, with publicly owned banks still accounting for more than two-thirds of the banking-sector activities in Algeria, Egypt and Syria. There are some signs, however, that such trend is decreasing during the crisis period. In short, although the official entry conditions appear comparable, there are significant and persistent entry obstacles that can curtail competition in the SEMCs' banking sectors, possibly emanating from official authority in practice and political interference.

6.5 Capital requirement stringency

One of the common aims of regulating banks is to ensure that they operate soundly through a solid capital base to sustain their operations and risk taking. Regulatory capital requirements are an important part of these rules, which determine the minimum amount of capital a bank should hold relative to its total assets (or risk-weighted assets).

Comparing the capital ratios represents a good first step towards understanding how sound the banking sector is. The capital ratios in the SEMCs are clearly higher than in the EU-MED countries, as depicted in Figure 6.6 and Table 6.5. For a start, with the exception of Greece, all the countries have maintained a total capital ratio of between 9% and 15%. Since 1998, the banks in the SEMCs have become better capitalised, with the average capital ratios reaching 16.9% towards the end of the period. In 2011, the capital ratios slightly decreased to 15.5%; especially the capital ratios of fast-growing banking sectors, like that of Turkey, declined.

Figure 6.6. Regulatory capital ratios, by region (% of risk-weighted assets)

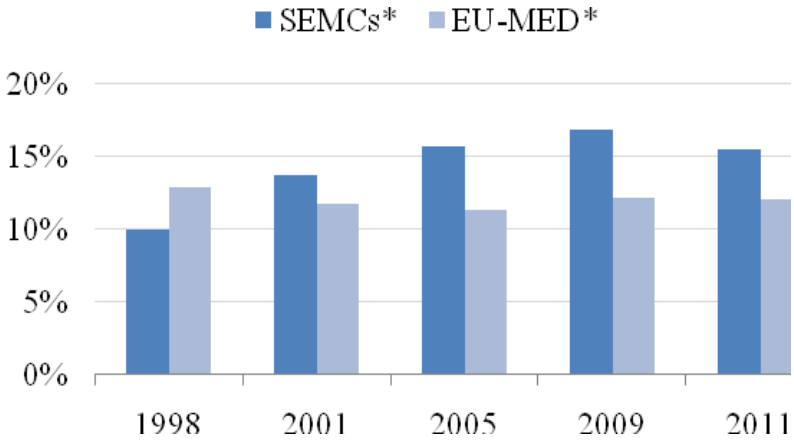

Table 6.5 Regulatory capital ratios, by country and region (% of risk-weighted assets)

	1998	2001	2005	2009	2011
Algeria	..	11.9	12.0	22.1	20.9
Egypt	10.2	9.8	14.1	15.1	15.6
Israel	9.2	9.5	10.7	12.6	14.0
Jordan	..	17.5	17.6	19.6	18.2
Lebanon	..	18.0	22.9	13.7	13.3
Morocco	13.1	12.6	11.5	11.8	11.7
Palestine	..	..	..	21.9	21.6

Syria	..	..	..	21.0	..
Tunisia	..	10.6	12.4	12.2	11.5
Turkey	..	20.8	22.8	20.6	16.6
SEMCs*	9.9	13.7	15.7	16.9	15.5
Cyprus	9.9	14.0	13.0	12.0	8.3
France	..	12.1	11.4	12.4	12.8
Greece	11.4	13.6	13.3	11.7	-1.7
Italy	13.4	10.4	10.6	12.1	12.7
Malta	..	..	..	13.5	13.5
Portugal	12.3	9.5	11.3	10.5	9.8
Spain	12.5	13.0	11.7	11.9	12.4
EU-MED*	12.9	11.7	11.3	12.1	12.1
AVG	12.6	11.9	11.6	12.4	12.4
STDEV	1.1	1.7	1.8	1.8	2.5

* Regional averages are weighted by total banking assets.

Notes: Figures represent the share of total capital in risk-weighted assets using the 1988 Basel Accord definitions.

Sources: BRSS and IMF Global Financial Stability Reports.

The SEMCs' banks appear to be at least as well capitalised as their northern counterparts, especially since the early 2000s. Does this result reflect the stringency of capital requirements or a lower appetite for risk? In other words, is it the regulations that make the banks sounder or are the banks simply not willing to take too many risks? To answer this important question, it is necessary to look deeper into the rules.

There are different ways of measuring the stringency of capital requirements. The index that is used here gives consideration to the types of capital allowed, the risk weights applied and whether the minimum capital ratios vary with risk. More specifically, the capital stringency index aims at determining the extent to which capital requirements restrict leverage potential and risky behaviour, including questions on i) whether the minimum capital-to-asset requirements are in line with 1988 Basel Accord definitions; ii) whether the minimum ratio varies with the bank's credit risk or iii) market risk and whether the value of iv) unrealised loan losses, v) unrealised security losses or vi) foreign exchange losses are deducted from regulatory capital. Additionally, the index seeks to measure the restrictions imposed on the source of regulatory capital, such as vii) whether these funds are verified by regulatory authorities and, whether viii) cash and government securities, or more generally ix) non-borrowed funds are the only allowed forms of capital for initial disbursements and

subsequent injections.[78] A greater number of affirmative responses to these questions lead to a higher stringency score.

Figure 6.7 and Table 6.6 summarise the comparison of the stringency of capital requirements for the countries in our sample. A quick glance through the figures reveals that the capital requirements have become more stringent in most of the countries in the sample as a result of the financial crisis, most probably. More and more SEMCs are implementing legislation to align their capital requirements with the Basel II capital standards. Jordan, Lebanon, Morocco, Syria and Turkey, for instance, adopted legislation that allowed banks to vary their minimum capital requirements depending on banks' individual credit risk and market risk. The implementation of this legislation led to a jump in capital stringency between 2007 and 2011. Among the SEMCs, Tunisia is the only exception, with clearly less stringent capital requirements. The Tunisian authorities notably filled out fewer questions regarding capital stringency than seven years earlier.

Among the EU-MED countries, Cyprus has the most stringent capital requirements, with affirmative answers to six out of seven questions in 2011, followed by France and Spain. Like all other EU-MED countries, the Cypriot regulatory/supervisory authorities do not verify the sources of funds to be used as capital. For France and Spain, there was a clear tendency towards a substantial strengthening of the rules. However, during the financial crisis, the capital requirements in these countries were relaxed a bit. Both countries allowed banks to increase capital with assets other than cash or government securities. The initial capital of banks in Greece, Italy and Malta can also include borrowed funds. Banks in Portugal are not obliged to deduct unrealised losses in securities portfolios from capital, but may fund capital contributions using assets other than government securities or cash.

[78] The stringency of the capital requirements index is addressed by WBG questions 3.1.1, 3.2, 3.3, 3.9.1, 3.9.2, 3.9.3, and 1.5–1.7. The calculation of the index is detailed in Appendix 2 of Barth et al. (2006, pp. 337-338). One question (WBG 3.7) on the fraction of revaluation gains allowed as part of capital has been omitted from the calculation of the index because the responses were not available for most of the countries in our sample.

Figure 6.7 Stringency of capital requirements, by region (% of maximum score)

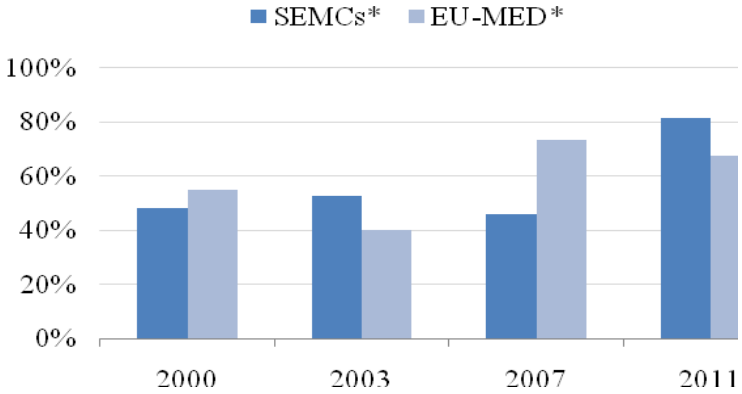

Table 6.6 Stringency of capital requirements, by country and region (% of maximum score)

	2000	2003	2007	2011
Algeria	..	44	78	..
Egypt	56	33	33	71
Israel	33	56	44	86
Jordan	67	67	56	86
Lebanon	56	67	56	71
Morocco	56	56	33	86
Palestine	..	..	..	86
Syria	..	..	33	71
Tunisia	..	67	..	57
Turkey	56	56	..	86
SEMCs*	48	53	46	81
Cyprus	11	44	67	86
France	56	22	89	71
Greece	33	56	33	57
Italy	44	33	33	57
Malta	67	56	56	57
Portugal	44	67	78	57
Spain	78	89	89	71
EU-MED*	55	40	73	68
AVG	54	41	72	69
STDEV	12	25	25	8

* Regional averages are weighted by total banking assets.

Note: Higher values represent more restrictive rules as a share of a maximum score of 9 points in 2000, 2003 and 2007 and 7 points in 2011.

Source: BRSS.

With these results in hand, it is easy to see that there is a pattern of convergence. EU members Greece, Italy, Malta and Portugal have rather flexible capital requirements, while the opposite is true for Cyprus, France

and Spain. In contrast, the capital requirements of most of the SEMCs are in general more stringent than the EU-MED averages, especially regarding rules concerning the usage of non-cash or government securities and borrowed funds for capital.[79]

6.6 Supervisory authority

A key issue in the effectiveness of banking regulations is whether the supervisory authorities have the necessary powers to apply a variety of measures to discipline or, at the extreme, resolve banks that violate the rules or engage in imprudent activities. To that extent, in most countries, the supervisors take prompt corrective action against a bank if the capital falls below the minimally required level. If the deterioration of the bank continues, the supervisor must have the ability to find a resolution before the bank becomes insolvent, posing a systemic threat. To be effective, the supervisors need access to reliable and frequently updated information on the condition of the banks. The judicial systems often allow the courts to intervene, thereby diminishing, postponing or reversing illegitimate supervisory actions, but these actions should not undermine the supervisor's chief responsibility of protecting and ensuring an orderly operation of the banking market. These aspects of supervisory system issues should be in line with the regulatory priorities and not subject to political patronage, which keeps supervisory authority independent and far from any interference. In short, the supervisors should have the authority to discipline potentially troubled banks and resolve problems while remaining independent of political influence.

Two indices are used for measuring supervisory authority.

The first index measures the official power of the supervisor to take specific actions to correct or prevent problems. The relevant questions include the ability of supervisors to i) meet external auditors without the approval of a bank, ii) communicate directly with auditors on illicit activities undertaken by a bank's management or directors, iii) receive disclosure of off-balance sheet items, iv) take legal action against negligent auditors, v) change the organisational structure of troubled banks, vi) order the management or directors to cover losses and vii) suspend dividend

[79] These results are largely in line with the key regulatory shortcomings identified for the region in Tahari et al. (2007), using compliance of European countries with Basel Core Principles (BCPs) on prudential regulations and requirements (BCPs 6 to 15) as a benchmark.

distributions, as well as viii) bonuses and ix) management fees. Additionally, for the 2003, 2007 and 2011 surveys, questions on troubled banks considered the supervisors' ability to x) declare insolvency, xi) suspend ownership rights, xii) supersede shareholder rights and xiii) fire or hire management or xiv) directors.[80] An affirmative answer to any of these questions represents greater supervisory power. Some of these powers may only be exercisable by some supervisory-like institutions, such as the depository insurance agency or the bank restructuring agencies, which grant more moderate power to supervisors.[81] In other cases, the courts or the government may be involved, which would serve to void the power of the supervisors in those actions.

Interestingly, Figure 6.8 and Table 6.7 show that the SEMCs and EU-MED countries grant more or less the same power to their supervisory authorities. These powers remained relatively unchanged pre- and post-crisis for the SEMCs and have been strengthened in the EU-MED. Yet there are large differences among the individual countries. In Jordan and Palestine, the official supervisor is allowed to intervene directly in all the domains highlighted above. On the other hand, the official supervisor in Syria has mostly elementary tools. It has, for instance, the possibility to meet external auditors without the approval of the bank. But it is not allowed to communicate directly with auditors on illicit activities or take any legal action against these auditors. The official supervisor can further prevent dividends being paid out, but it cannot suspend bonuses for the management. Moreover, as in all the SEMCs excluding Jordan and Palestine, the Syrian official supervisor does not have the authority to declare a bank insolvent or supersede shareholder rights.

[80] The official supervisory power index is addressed by WBG questions 5.5-5.7, 6.1, 10.4, 11.2, 11.3.1-11.3.3, 11.6, 11.7, and 11.9.1-11.9.3. The calculation of the index is detailed in Appendix 2 of Barth et al. (2006, pp. 339-342).

[81] In these cases, the aggregate score is augmented by only half points; for more details, see the calculation of the index in Appendix 2 of Barth et al. (2006, pp. 339-342).

Figure 6.8 Official supervisory power, by region (% of maximum score)

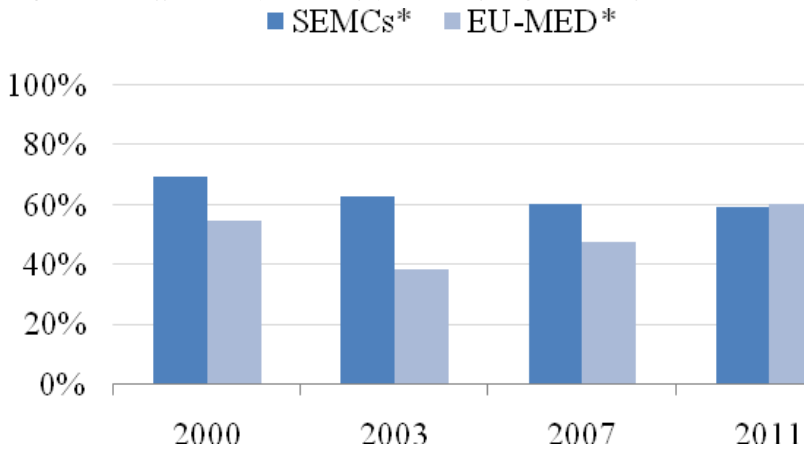

Table 6.7 Official supervisory power, by country and region (% of maximum score)

	2000	2003	2007	2011
Algeria	..	76	58	..
Egypt	100	74	74	64
Israel	44	37	53	50
Jordan	67	74	47	79
Lebanon	100	53	53	50
Morocco	78	66	68	43
Palestine	..	..	..	79
Syria	..	..	68	36
Tunisia	..	68	..	57
Turkey	67	82	..	68
SEMCs*	69	63	60	59
Cyprus	100	42	63	64
France	67	37	45	57
Greece	56	63	53	39
Italy	33	26	37	71
Malta	67	74	74	71
Portugal	67	74	74	71
Spain	44	47	61	57
EU-MED*	54	38	48	60
AVG	56	40	48	60
STDEV	16	13	10	8

* Regional averages are weighted by total banking assets.

Note: Higher values represent more restrictive rules as a share of a maximum score of 9 points in 2000, 19 points in 2003 and 2007, and 14 points in 2011.

Source: BRSS.

Turning to the EU-MED countries, it is interesting to see that the new member state, Cyprus, grants increasing official power to its authorities.

The same applies to France and Italy and, to a lesser extent, Portugal and Spain. Greece once again obtains the lowest score in official supervisory power: unlike other countries in our sample, the Greek supervisory authority has no right to meet the external auditor without prior approval of the bank or sue the auditors for negligence. The banks are also not obliged to publish information on off-balance sheet positions. Furthermore, the supervisor does not have any power to suspend shareholder rights or replace management.

The second index for assessing supervisory authority turns more generally to the independence of the supervisor from political influence. For this index, three questions from the BRSS are considered: i) Are supervisory bodies accountable *only* to a legislative body? ii) Are supervisors legally liable for their actions committed in the exercise of their duties? and iii) Does the head of the agency have a fixed term? The level of independence is determined by points obtained from counting affirmative answers to questions (i) and (iii) and a negative answer to (ii).[82]

The results depicted in Figure 6.9 and Table 6.8 show a clear divergence in terms of independence from political interference. While the banking supervisors of the EU-MED countries have become more independent, far less has changed in the SEMCs. The biggest concern remains the accountability of the supervisor directly to the executive arm, i.e. the president, the prime minister or other cabinet members, which is the case in all of the SEMCs.[83]

Of particular concern is Algeria, where none of the three criteria outlined above was satisfied in the last available survey, which implies an enormous potential for political interference. The same can also be said of other countries, such as Israel, Lebanon, Morocco and Syria. In comparison, the supervisor is only accountable to a legislative body (such as a parliament) in almost all EU member states except Greece and Italy, as well as in Egypt, Jordan, Palestine, Tunisia and Turkey. Once again, the Italian supervisory authority remains well below the EU standards in terms of independence from political interference due to its accountability to the

[82] The independence from political interference index is addressed by WBG questions 12.2, 12.10 and 12.2.2. The calculation of the index is slightly different from the specification in Appendix 2 of Barth et al. (2006, pp. 349-350), in that to score a point in question 12.2, the supervisory bodies should be accountable to no one other than a legislative body, such as the parliament or congress.

[83] In the case of Morocco, the governor of the Bank Al-Maghrib serves at the discretion of the King.

central government and its legal liability for damages to a bank in the exercise of its duties. Another key distinguishing factor is the fixed term for the head of the regulatory authority, which is not available as an option in Algeria, Israel, Morocco or Syria, but has become increasingly popular among the EU members.

The results of the BRSS surveys reviewed in this section show that the powers granted have increased or remained constant in almost all of the countries. Moreover, the official powers granted to supervisors appear to be on the rise on both sides of the Mediterranean. Turning to operational independence, government officials have the ability to politically interfere in the work of the supervisors. Therefore, despite the fact that the supervisors are assigned almost full authority, it is possible that these powers remain notional due to government interference. Provided that some of the SEMCs have a substantial government presence in the banking sector (already noted above), operational independence should be a guiding principle to ensure that all banks – publicly or privately-owned – are treated equally.

Figure 6.9 Independence from political interference, by region (% of maximum score)

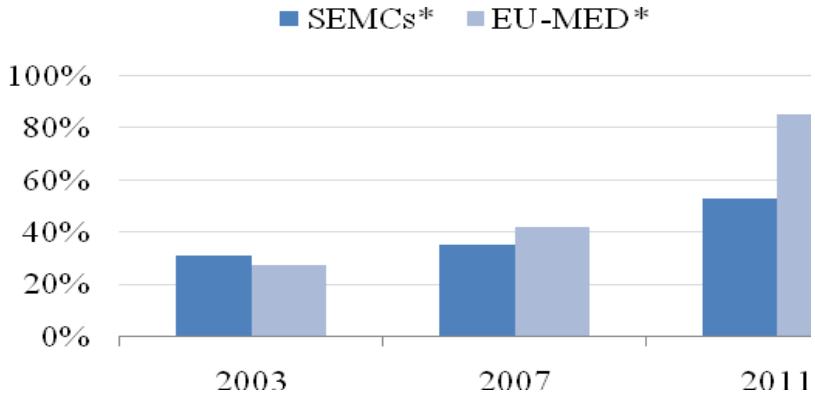

Table 6.8 Independence from political interference, by country and region (% of maximum score)

	2003	2007	2011
Algeria	33	0	..
Egypt	67	67	67
Israel	0	33	33
Jordan	67	33	67

Lebanon	33	33	33
Morocco	33	33	33
Palestine	..	..	67
Syria	..	0	33
Tunisia	67	..	67
Turkey	33	..	67
SEMCs*	31	35	53
Cyprus	67	100	100
France	33	33	100
Greece	67	33	67
Italy	0	33	33
Malta	100	67	67
Portugal	67	67	100
Spain	33	67	100
EU-MED*	27	42	85
AVG	28	42	82
STDEV	19	15	28

* Regional averages are weighted by total banking assets.

Notes: Higher values represent more independence as a share of a maximum score of 3 points.

Source: BRSS.

6.7 Deposit insurance

A deposit insurance system is one of the key elements of a country's financial safety net, designed to prevent any disruptions to the financial markets and the economy. By protecting depositors, the deposit insurance schemes provide confidence to relatively small depositors and prevent bank runs. At the same time, they may introduce moral hazard, diminishing the depositors' incentives to monitor and screen the banks and amplifying the shareholders' incentives to engage in excessive risk. The moral hazard problem implies that banks have incentives to take on risk that can be shifted to a deposit insurance fund or, ultimately, the taxpayers.

Efforts are being taken across the world to mitigate moral hazard problems arising from deposit guarantee schemes.[84] First, the amount of coverage matters. In some countries, aside from limits on the total amount, co-insurance is imposed to ensure that depositors bear some share of the

[84] See Kane (2000) and Demirgüç-Kunt et al. (2005) for a review of the potential effects and key design features of the deposit insurance schemes.

costs.[85] Second, the use of risk-adjusted premiums may also serve to better internalise the costs of the risks that they take. Third, the way that the deposit insurance schemes are funded also matters. For example, when the government is explicitly or implicitly involved in providing the necessary funds, moral hazard may be attenuated, especially in countries where the government has ample resources. In turn, when the system is backed with funds provided by banks, moral hazard can be limited by the understanding that the amount of guarantees is restricted by the pooled reserves.

Looking at the existing schemes, there are clear differences in the two sets of countries bordering the Mediterranean (Table 6.9). The revised EU Deposit Insurance Directive requires EU member states to maintain deposit insurance with a coverage limit of at least €100,000, raised from a minimum of €20,000 in the aftermath of the 2007–09 financial crisis.[86] Most of the EU-MED countries have chosen to set this base amount as their coverage limits, representing between four and six times the average figures for annual income per capita. The 2009 amendment also abolished the co-insurance system, which allowed up to 10% of losses to be shared with covered depositors. Risk-based premiums exist in about half of the countries, including France, Greece, Italy and Portugal. Setting itself clearly apart from the other countries in the region, Italy has an *ex-post* funding structure, where the banks are required to contribute after the deposit guarantee scheme is activated. Cyprus, France and Malta have hybrid systems in which substantial amounts of supplementary (*ex-post*) funding may be activated if the funds' resources fall below pre-set levels. The levels of *ex-ante* funds display substantial variation, wherever they exist, with a low of 0.1% of eligible deposits in France and a high of 1.69% in Greece.

Turning to the SEMCs, Egypt, Israel, Palestine, Syria and Tunisia have no schemes in place.[87] In Algeria, Morocco and Turkey, the coverage limits represent one to two times the average annual income, pointing at a much lower level of protection afforded than in the EU. As in the EU-MED

[85] Empirical evidence shows that the coverage limits and co-insurance practices serve to reduce the likelihood of bank failure substantially (Demirgüç-Kunt & Detragiache, 2002).

[86] See Directive 2009/14/EC, which amended the Deposit Guarantee Directive 94/19/EC. The minimum amount of €100,000 has been in force since 31 December 2010.

[87] In Egypt, although the legal framework allows for the establishment of an autonomous deposit insurance fund, no scheme has been set up yet.

countries, the deposit guarantee schemes do not have a co-insurance option. Turkey is the only country that uses risk-based premiums.

The deposit insurance scheme index identifies the level of observance of standards that are thought to mitigate the moral hazard problem. Since recent information is available, the index is constructed for the years 2003, 2007 and 2011. For countries with an explicit system, three issues are relevant: i) whether a co-insurance discount is applicable to pay-outs, ii) whether premiums are risk-adjusted and iii) whether only banks take a primary role.[88] An additional point is scored for an affirmative answer to each one of these questions. A score of zero is assigned to countries where no explicit system exists, since in those cases the government is assumed to provide implicit guarantees, implying a greater incentive for banks to take risks.[89]

[88] The calculation of the deposit insurance scheme index follows the format detailed in Barth et al. (2006, p. 354), except that a score of zero is assigned to countries with no explicit insurance scheme.

Three separate sources were used for the information on the deposit insurance scheme. First, the BRSS provided the basic information and evaluation for 2003 and 2007. Whenever the BRSS gave conflicting or incomplete results, the information contained in Demirgüç-Kunt et al. (2005), the European Commission's (2010) assessment of EU deposit guarantee schemes as well as the legal documents from the websites of Bank Al-Maghrib and Banque d'Algérie were used.

[89] Gropp & Vesala (2004) shows that credible implicit guarantees operating through the expectation of public intervention at times of distress can aggravate the moral hazard problem when compared with explicit deposit guarantee schemes. As the authors note, the key issue is whether the institutional and fiscal conditions would make the inherent guarantees credible. It is assumed here that the three countries with no explicit systems, namely Egypt, Israel and Tunisia, have ample fiscal resources and the necessary institutional framework that could make such guarantees credible.

Table 6.9 Deposit guarantee schemes in the Mediterranean, latest available figures

	Est. date	Coverage limit		Funding (public or banks)	Co-insurance	Risk-based premiums	*Ex post/ ex ante*	Coverage ratio**
		€ (current)	(% of GDP per capita in 2012, PPP)					
SEMCs								
Algeria	1997	6,000	108	Banks	No	No	*Ex ante*	n.a.
Egypt	..	..	..	..	..	..	..	..
Israel	..	..	..	..	..	..	..	..
Jordan	2000	52,500	1,142	Banks	No	No	*Ex ante*	1.87
Lebanon	1967	2,500	19	Banks	No	No	*Ex ante*	n.a.
Morocco	1993	7,000	177	Banks	No	No	*Ex ante*	n.a.
Palestine	..	..	..	..	..	..	..	..
Syria	..	..	..	..	..	..	..	..
Tunisia	..	..	..	..	..	..	..	..
Turkey	1983	21,000	182	Banks	No	Yes	*Ex ante*	6.05
EU-MED								
Cyprus	2000	100,000	479	Banks	No*	No	Hybrid	0.31
France	1999	100,000	363	Banks	No*	Yes	Hybrid	0.10
Greece	1995	100,000	515	Banks	No*	Yes	*Ex ante*	1.69
Italy	1987	103,291	428	Banks	No*	Yes	*Ex post*	0.00
Malta	2003	100,000	494	Banks	No*	No	*Ex ante*	0.40
Portugal	1992	100,000	561	Banks	No*	Yes	*Ex ante*	1.06
Spain	1977	100,000	424	Banks	No*	No	Hybrid	0.65

* Co-insurance has been abandoned by the amending Directive 2009/14/EC.

** The actual EU-MED coverage ratio is calculated as the ratio of *ex-ante* funds and eligible deposits using published figures for 2007–08. For Turkey and Jordan, the end of 2011 total reserves of the deposit insurance schemes is divided by the total insured deposits.

The scores in Figure 6.10 and Table 6.10 show that moral hazard issues stemming from implicit guarantees are more of a threat in the SEMCs. For the most part, this is owing to the absence of explicit deposit guarantee schemes in Egypt, Israel, Palestine, Syria and Tunisia. The Algerian system was equivalent to an implicit guarantee in 2003, as the government had a direct funding role.[90] Looking at countries with explicit systems, some similarities emerge. Out of the three issues outlined above, Algeria, Cyprus, Spain, Greece, Jordan, Lebanon, Malta and Morocco only satisfied the requirement that the banks (and not the government) take the primary role of funding the scheme in 2011. The French, Greek, Italian and Portuguese systems, in contrast, include risk-adjusted premiums, significantly impacting the EU-MED averages. Lastly, the EU-MED averages display a downward trend, which is entirely due to the gradual abandonment of the co-insurance payouts. On the other hand, in 2010 the European Commission published a proposal to harmonise the deposit guarantee schemes in the EU, which would oblige the EU member states to implement a risk-based, deposit guarantee scheme that is bank-funded. However, the proposal has not been adopted, since the European Parliament and Council have not yet agreed on the final terms.

Many of the SEMCs do not have an active deposit insurance scheme, albeit some countries, like Israel, Palestine, Syria and Tunisia, are studying or considering implementing one. A badly designed scheme can invite additional risks and may not be better than a system with no scheme at all. The results show that the schemes in Jordan, Lebanon and Morocco (as well as in some EU-MED countries) may indeed amplify the moral hazard risks. Still, these conclusions should be interpreted with care. As the recent financial crisis has shown, when a run on a bank has the potential to spur broader panic, the governments are likely to step in to stop a potential bank run, notwithstanding the types of explicit arrangements in place.[91] One may wonder, quite justifiably, whether the named arrangements really do mitigate moral hazard when they may be so easily replaced with limitless state support. Yet, it should not be forgotten that such blanket guarantees

[90] Under Law No. 90-10 of 1990 regarding money and credit, the Algerian Treasury was a contributor to the deposit guarantee fund (Art. 170). More recently, the government's funding role has been replaced with full funding by banks under the amending Law No. 03-11 of 2003 regarding money and credit (Art. 118).

[91] This was amply demonstrated during the fall of Northern Rock in 2007, when the UK Treasury extended the existing guarantees on bank deposits – with a maximum payout of £31,700 at the time – to cover all deposits.

are not viable in most of the SEMCs with limited public resources. Therefore, the explicit schemes, wherever they exist, are the only viable insurance for depositors, highlighting the importance of the design issues in resource-poor countries.

Figure 6.10 Deposit insurance index, by region (% of maximum score)

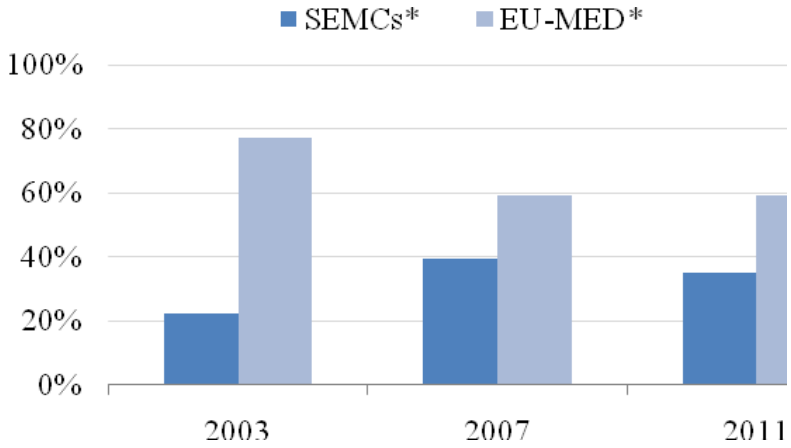

Table 6.10 Deposit insurance index, by country and region (% of maximum score)

	2003	2007	2011
Algeria**	67	100	100
Egypt	0	0	0
Israel	0	0	0
Jordan	67	67	33
Lebanon	33	33	0
Morocco	67	67	33
Palestine	0	0	0
Syria	0	0	0
Tunisia	0	0	0
Turkey	33	67	67
SEMCs*	22	40	35
Cyprus	67	33	33
France	100	67	67
Greece	33	33	67
Italy	67	67	67
Malta	67	33	33
Portugal	100	100	67
Spain	33	33	33
EU-MED*	77	59	59
AVG	74	58	57
STDEV	30	18	18

* Regional averages are weighted by total banking assets.

** The Algerian deposit guarantee system, which has existed since 1997, was partly funded by the government in 2003.

Notes: Higher values represent more restrictive rules as a share of a maximum score of 3 points.

Sources: BRSS, Demirgüç-Kunt et al. (2005), European Commission (2010), Federal Deposit Insurance Corporation, Bank Al-Maghrib and Banque d'Algérie.

6.8 Private monitoring

Most of the regulatory factors relate to the rules and standards set forth by the regulators, which are used to distinguish between acceptable and unsound behaviour. In this manner, the regulatory principles are often well defined, calling for compliance with specific rules or standards. There are other hard-wired forces that also influence banks, however. Market forces and investors may additionally be crucial in shaping decisions and, in particular, restraining risky behaviour. For example, block-holders can, at least in theory, exercise their voting power to influence managerial actions. More realistically, debtors or stockholders use available information to assess the banks' conditions and indirectly influence the management by withdrawing funds, which has an impact on the borrowing costs of the banks. As far as depositors and other debt-holders are concerned, private monitoring could be seriously undermined when an explicit and over-generous scheme for deposit insurance exists.

The availability of reliable and timely information for investors is at the core of market discipline. The index is therefore based on the survey responses to a number of questions on disclosure rules and standards. These concern whether i) a certified audit is required and whether all of the top ten banks are rated by ii) domestic or iii) international credit rating agencies. They also consider whether income standards include accrued but unpaid interest on iv) performing or v) non-performing loans, vi) banks are required to produce consolidated accounts, vii) directors are liable for erroneous or misleading reporting, viii) subordinated debt is allowable or required as part of capital, ix) off-balance items are disclosed to the public, x) banks are required to disclose risk-management procedures and xi) supervisors are required to make enforcement actions public.[92] The private

[92] The private monitoring index is addressed by WBG questions 5.1, 5.3, 10.7.1-2, 10.1, 10.1.1, 10.3, 10.6, 3.5-6, 10.4.1, 10.5 and 11.1.1. The calculation of the index is slightly different from the specification in Appendix 2 of Barth et al. (2006, pp. 350-352), excluding a question on the presence of an explicit deposit insurance, which is already covered in another index.

monitoring score increases with affirmative answers to the previous set of questions.

The comparisons point at a small but growing disparity between the two set of nations surrounding the Mediterranean in Figure 6.11 and

Table 6.11. Although most countries fulfil a majority of the requirements, the continual progress of the European countries is not paralleled in the SEMCs.

The most striking difference between the SEMCs and EU-MED countries is the share of the top ten banks that are rated by (international or domestic) credit-rating agencies (CRAs), which has widened substantially according to the 2011 survey. In particular, almost all of the top ten banks are rated by credit rating agencies in the EU, except Cyprus and Malta. In the SEMCs, most banks are not rated. In some cases, this is due to the inherent structure of the market. For example, Algeria's largest banks are state-owned and as of 2007 they were not subject to ratings. In other countries, there are clear problems with disclosure. In three of the most developed markets in the region – Israel, Lebanon and Morocco[93] – only half of the top ten banks are rated.[94]

Another common issue that has attracted special attention recently is the exclusion of accrued (though unpaid) interest from income statements, which allows banks undue flexibility in determining their earnings. Lastly, according to the 2011 BRSS, the banks in Tunisia are not required to make public their risk-management procedures, despite this requirement having become standard in the region in recent years.

[93] The observation for Morocco is from the 2007 survey, since the Moroccan authorities did not report the equivalent number in the most recent survey.

[94] These results may also arise from a small or highly concentrated banking sector. In such a case, only a handful of top banks will dominate the banking sector, while the other (smaller) banks will be subject to less investor scrutiny.

Figure 6.11 Private monitoring, by region (% of maximum score)

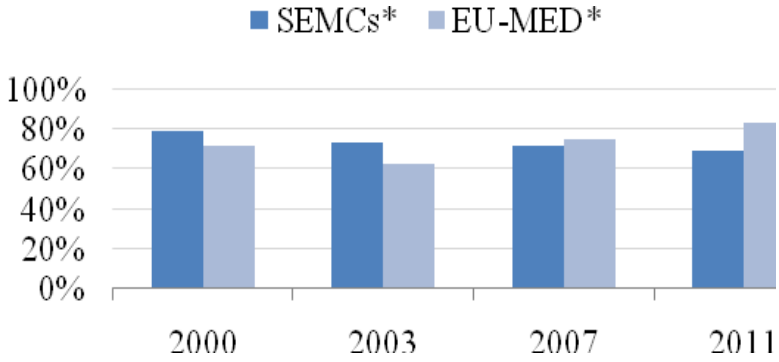

Table 6.11 Private monitoring, by country and region (% of maximum score)

	2000	2003	2007	2011
Algeria	..	64	55	..
Egypt	78	73	73	73
Israel	89	82	82	73
Jordan	78	64	64	73
Lebanon	100	64	64	36
Morocco	67	73	64	73
Palestine	..	..	..	82
Syria	..	..	82	73
Tunisia	..	55	..	55
Turkey	67	73	..	73
SEMCs*	79	73	71	69
Cyprus	67	73	73	82
France	67	55	73	91
Greece	67	64	82	73
Italy	67	73	73	73
Malta	89	73	73	73
Portugal	89	55	64	55
Spain	89	73	82	82
EU-MED*	71	63	75	83
AVG	72	64	74	82
STDEV	9	9	5	10

* Regional averages are weighted by total banking assets.

Note: Higher values represent more restrictive rules as a share of a maximum score of 9 points in 2000 and 11 points in 2003, 2007 and 2011.

Source: BRSS.

These results show that the regulatory structures of the SEMCs have not matched the progress made in the EU-MED countries in enhancing disclosure rules. Still, it is true that there are broad similarities on both sides of the Mediterranean. For example, a certified audit is compulsory in all of the sample countries and the accounting rules exhibit similarities in most of the countries. Even so, the proportion of banks subject to independent ratings has not changed much in the SEMCs over the past few years.

6.9 Credit information and laws

Access to information and laws on creditor protection are crucial elements for ensuring the smooth operation of credit markets. Economic theory suggests two critical limits to the amount of credit that financial institutions can grant to potential borrowers. On the one hand, credit conditions are clearly bound by the ability of creditors to enforce contracts, exact repayment, claim collateral and possibly gain control over the receivables. The easier these actions are, the more likely it is that lenders will grant the loans. On the other hand, lenders would like to have access to accurate information on the potential borrowers, such as credit histories, other lenders and other banking transactions.

Theoretical models suggest that an operational information-sharing infrastructure can reduce adverse selection in credit markets and facilitate access to credit, especially among more opaque borrowers, such as SMEs (Pagano & Jappelli, 1993). When such information is available, the creditors can make a better judgement of the creditworthiness of the borrowers. Other studies have documented the importance of creditors' rights for the availability of credit (La Porta et al., 1998; Levine, 1998). Recent studies have confirmed these views with increasingly convincing evidence that both credit-information mechanisms and creditors' rights have a significant impact on the flow of credit and financial development (Jappelli & Pagano, 2002; Djankov et al., 2007; Haselmann et al., 2010).

The indices on credit information and laws developed in this section are based on the "Getting Credit" methodology developed in the World Bank's Doing Business surveys.[95] The relevant area covers the legal rights

[95] First started in 2003, the World Bank's Doing Business surveys cover over 180 countries, providing a snapshot of regulatory and legal conditions and their effects on businesses, especially on SMEs. Each year, the surveys are sent out to a large number of local experts specialising in different fields, including lawyers,

of borrowers and lenders with respect to secured transactions and the extent of credit-information sharing. Two sets of indicators are used for these purposes.

The first set describes how well the collateral and bankruptcy laws facilitate lending, covering: i) the ability to use moveable assets while keeping possession of assets and the ability to obtain non-possessory security rights in ii) a single or iii) all moveable asset classes without requiring a specific description of the collateral. It also covers iv) the extension of security rights to future or after the acquisition, v) the ability to secure all types of debts and obligations through a general description, and vi) the availability of a collateral registry. In addition, it looks at the ability of secured creditors to obtain priority without exceptions in the case of vii) defaults, viii) liquidation and ix) restructuring; and x) the possibility of out-of-court agreements on collateral enforcement. An affirmative answer to any one of these questions enhances the relevant scores.[96]

Figure 6.12 and Table 6.12 show that fewer legal rights are granted to creditors in the SEMCs. Israel does exceptionally well, better than almost all countries, by satisfying all but one criterion on the availability of out-of-court agreements on collateral enforcement. Among the EU-MED countries, Cyprus does equivalently well, complying with all but one criterion, namely regarding the secured creditors' claims during reorganisation. France and Spain also perform well. Other countries, including those in the SEMCs, score relatively poorly, complying only with the criteria on the use of movable assets as collateral, the ability to grant non-possessory rights for a group of assets and the use of debts in collateral agreements.

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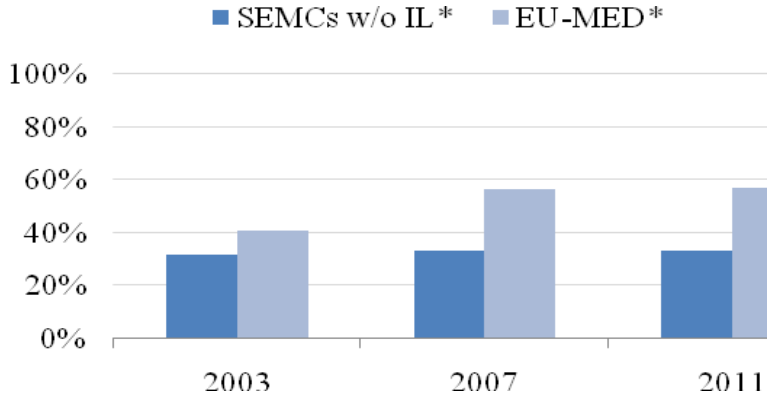
consultants, officials and other professionals who are in close contact with the legal and regulatory structures of the countries covered (the results of the surveys are available at www.doingbusiness.org).

[96] See the World Bank's Doing Business website for more details on the methodology (www.doingbusiness.org/methodology/getting-credit).

Figure 6.12 Strength of legal rights, by region (% of maximum score)



* Regional averages are weighted by total banking assets.

Table 6.12 Strength of legal rights, by country and region (% of maximum score)

	2003	2007	2011
Algeria	30	30	30
Egypt	30	30	30
Israel	90	90	90
Jordan	20	20	20
Lebanon	30	30	30
Morocco	30	30	30
Palestine**	10	10	10
Syria	10	10	10
Tunisia	30	30	30
Turkey	40	40	40
SEMCs*	48	45	45
Cyprus	..	90	90
France	40	70	70
Greece	40	40	40
Italy	30	30	30
Malta	..	..	30
Portugal	30	30	30
Spain	60	60	60
EU-MED*	41	56	57
AVG	41	56	56
STDEV	12	18	18
SEMCs w/o Israel*	32	33	33

* Regional averages are weighted by total banking assets.

** Data for West Bank and Gaza.

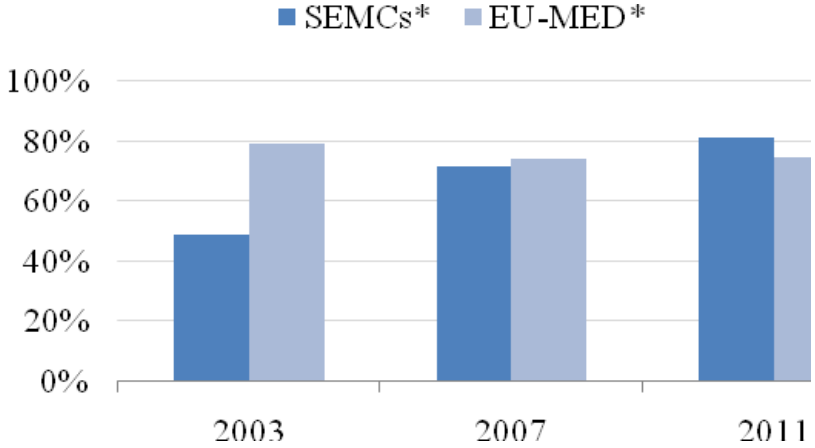
Note: Higher values represent more independence as a share of a maximum score of 10 points.

Source: World Bank Doing Business surveys.

The second index measures the availability, coverage and depth of credit information, either through public credit registries or private credit bureaus. The relevant questions relate to the: i) collection of both positive and negative information, ii) collection of data on firms and information, iii) collection of data from retailers and utility companies, iv) availability of credit history for at least two years, v) availability of data on small loans (i.e. less than 1% of annual incomes) and vi) ability of borrowers to access their credit history. As above, an affirmative answer to any one of these questions leads to an additional score for the credit information index.

Figure 6.13 and Table 6.13 clearly show that the SEMCs have progressively closed the gap with the EU-MED countries in terms of the depth of credit information. The average score of the SEMCs in the last survey was even higher than the score of their EU-MED counterparts. In recent years, the credit bureaus in Algeria, Egypt, Morocco, Palestine and Tunisia have improved their information provisioning substantially. In the more recent Doing Business survey, Egypt even satisfied all six criteria. The credit bureaus in Lebanon, Morocco, Tunisia and Turkey only failed to satisfy the criteria to also collect data from retailers and utility companies. Similarly, the credit bureau in Israel also met five of the criteria, but it did not report both positive and negative credit information. Jordan and Syria are clearly outliers in the southern and eastern Mediterranean; exceptionally, both countries have credit bureaus that only met two of the criteria.

Figure 6.13 Depth of credit information, by region (% of maximum score)



* Regional averages are weighted by total banking assets.

Table 6.13 Depth of credit information, by country and region in 2003, 2007 and 2011 (% of maximum score)

	2003	**2007**	**2011**
Algeria	17	33	67
Egypt	33	83	100
Israel	50	83	83
Jordan	33	33	33
Lebanon	67	83	83
Morocco	17	33	83
Palestine**	0	50	67
Syria	0	0	33
Tunisia	33	83	83
Turkey	83	83	83
SEMCs*	49	72	81
Cyprus	..	0	33
France	67	67	67
Greece	67	67	83
Italy	100	83	83
Malta	..	..	0
Portugal	83	83	83
Spain	83	83	83
EU-MED*	79	74	74
AVG	77	74	75
STDEV	17	11	11

* Regional averages are weighted by total banking assets.

** Data for West Bank and Gaza.

Note: Higher values represent greater independence as a share of a maximum score of 6 points.

Source: World Bank Doing Business surveys.

Turning to the EU-MED countries, Cyprus and Malta are exceptions with low scores. In Cyprus, the private credit bureau only meets two criteria and there is not a single credit bureau in Malta. More broadly, the other EU-MED countries comply with almost all of the criteria. Like many of their SEMC counterparts, French, Greek, Italian and Portuguese credit registries do not collect information from retailers or utility companies. Moreover, the French credit bureau does not provide both positive and negative information. The Spanish credit bureaus do not distribute historical credit information older than two years, but meet all the other criteria.

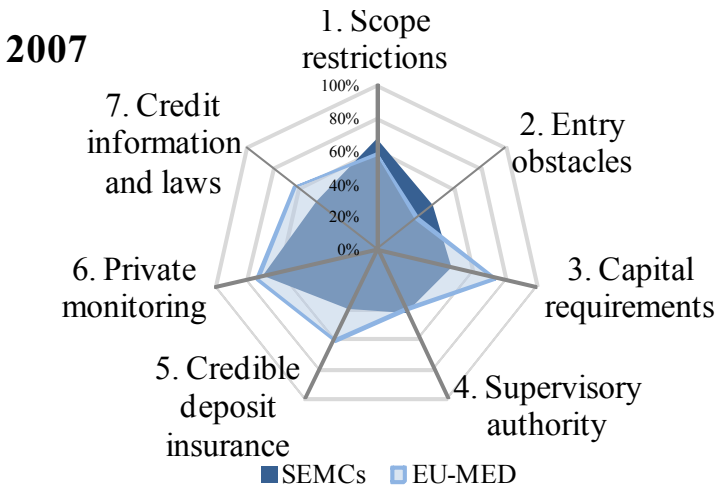
In summing up, the figures above show that substantial reforms in recent years have helped the SEMCs clearly to close the gap with the EU-MED countries in terms of the use of credit information. The same cannot

be said concerning the strength of legal rights; the EU-MED countries' average is clearly higher than that of the SEMCs.

6.10 Conclusions

The previous section reviewed the quality and the level of convergence of the regulatory and supervisory structures of the SEMCs and EU-MED countries in the pre- and post-financial crisis periods. The assessment included seven dimensions, including the scope of banking, entry obstacles, the stringency of capital requirements, the power and independence of the supervisory authority, the incentives provided by the deposit insurance scheme, private monitoring, and creditors' rights and access to information. This section provides a summary of these areas, offering a comparative analysis of the seven composite indicators that aggregate the relevant indices.

Figure 6.14 Levels of convergence of regulatory standards in the SEMCs and EU-MED region pre- and post-crisis (2007 and 2011)



Note: The figures above sum up the weighted averages for the SEMCs and EU-MED countries for the regulatory indices in each of the seven areas discussed in sections 6.3 to 6.9.

The collective assessment of the regulatory and supervisory structures of the SEMCs with the EU-MED standards pre- and post-crisis gives a mixed picture (Figure 6.14). Despite some improvements, key weaknesses remain in deposit insurance, entry obstacles and the strength of legal rights. Moreover, some disparities have also become more apparent, especially in the potential for political interference and private monitoring.

Turning to the individual countries, Table 6.14 provides an overview of the key weaknesses in each of the 10 SEMCs. The diagrams in Figure 6.15 further show the main impacts of the financial crisis on the regulatory developments in six SEMCs that participated in both the Barth 2007 and 2011 databases.

There has been no improvement in the deposit insurance index in recent years, because the Egyptian, Israeli, Palestinian, Syrian and Tunisian authorities have chosen not to put in place an explicit insurance scheme. As discussed in section 6.7, implicit schemes may enhance risk-taking through a blanket government guarantee for the leading institutions. In addition, in Algeria, Jordan, Lebanon and Morocco, no effort has been made to align the banks' incentives by implementing risk-based premiums or co-insurance schemes, which would help internalise some of the costs to the deposit guarantee schemes that stem from excessive risk-taking.

Table 6.14 Summary of key regulatory weaknesses in the 10 SEMCs, by country

Area	**General remarks**	**Algeria**	**Egypt**	**Israel**	**Jordan**
I. Scope restrictions on or prohibition of various activities	Slightly more stringent than EU-MED standards	Some restrictions on real estate; insurance activities prohibited	Some restrictions on insurance & real estate	Some restrictions on securities trading & insurance; real estate activities prohibited	Some restrictions on securities trading & insurance; real estate activities prohibited
II. Entry obstacles – Licensing, foreign entry & presence of public banks	Below EU-MED standards due to foreign denials & the role of government	Public banks represent >90% of bank activity	Foreign denials; public banks represent > 60% of bank activity		Foreign denials
III. Capital requirements that restrict risks	More stringent capital requirements than the EU-MED		Market risks not considered		
IV. Supervisory authority – Ability to prevent & correct problems	Below EU-MED standards due potential for political interference	High potential for political interference	Some potential for interference	High potential for political interference	Some potential for interference

V. Deposit insurance – Presence of an explicit scheme & mitigation of moral hazard	Below EU-MED standards due to the implicit insurance & adverse incentives	No co-insurance or risk-adjusted premiums	No explicit deposit insurance scheme	No explicit deposit insurance scheme	No co-insurance or risk-adjusted premiums
VI. Private monitoring – Availability of reliable & timely information to investors	Increasing disparity due to limited rated banks and flexibility in accounting	Top banks not rated; flexibility in accounting	Several top banks not rated	Several top banks not rated	Several top banks not rated
VII. Credit information & laws – Ability to facilitate lending	Below EU-MED standards due to deficient legal rights	No private credit registry; limited legal rights for creditors	Limited legal rights for creditors		No private credit registry; limited legal rights for creditors

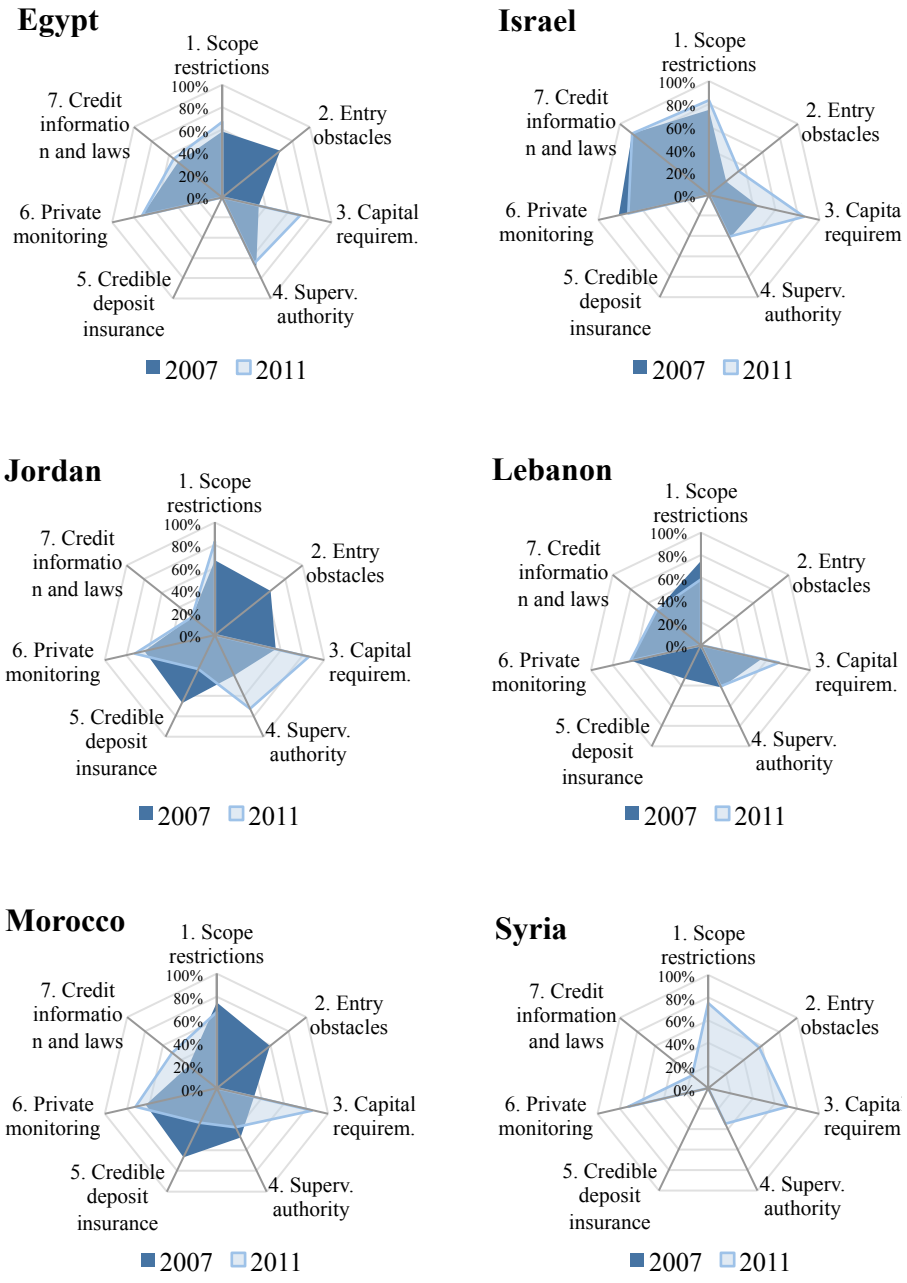
Table 6.14 Key regulatory weaknesses in the 10 SEMCs, by country (cont.)

	Lebanon	**Morocco**	**Palestine**	**Syria**	**Tunisia**	**Turkey**
I. Scope restrictions	Real estate activities prohibited	Some restrictions on insurance; real estate activities prohibited		Insurance & real estate activities prohibited	Some restrictions on securities & insurance	Some restrictions on insurance; real estate activities prohibited
II. Entry obstacles	Public bank activity	Foreign denials		Public banks represent >70% of bank activity	Public banks have a diminishing role	Foreign denials; Public banks represent >30% of bank activity
III. Capital requirements	Broad definition of capital			Broad definition of capital		
IV. Supervisory authority	High potential for political interference	Some potential for interference	Some potential for interference	High potential for political interference	Some potential for interference	Some potential for interference
V. Deposit insurance	No co-insurance or risk-adjusted premiums	No co-insurance or risk-adjusted premiums	No explicit deposit insurance scheme	No explicit deposit insurance scheme	No explicit deposit insurance scheme	No co-insurance

VI. Private monitoring	Several top banks not rated	Several top banks not rated; flexibility in accounting	Several top banks not rated	Several top banks not rated	Flexibility in accounting rules; no risk management disclosure	Flexibility in accounting
VII. Credit information & laws	No private credit registry; limited legal rights for creditors	Limited legal rights for creditors	No private credit registry; barely any legal rights for creditors	No private credit registry; barely any legal rights for creditors	No private credit registry; limited legal rights for creditors	Limited legal rights for creditors

Source: Authors' compilation.

Figure 6.15 Impact of the financial crisis on regulatory standards in six SEMC by area



Note: The figures above diagram the indices in six out of the 10 SEMCs analysed in this chapter between 2007 and 2011. Algeria, Palestine, Tunisia and Turkey are excluded because of insufficient observations for one of the two years. The figures above sum up the averages for the regulatory indices in each of the seven areas discussed in sections 6.3 to 6.9.

Another major issue, the presence of entry obstacles, continues to be a key weakness in the regulatory structures of the region. Although the licensing requirements exhibit similarities in all countries of the Mediterranean, other indicators point to substantial barriers to entry. Government ownership, which is widespread in the region, gives undue advantages to incumbent banks and restricts entry incentives. In Algeria, Egypt and Syria as well as to some extent Morocco, Tunisia and Turkey, government ownership remains significant. Although government ownership may have some benefits, the authorities have to ensure that such roles are well defined within a national strategy with clear objectives and instruments, and that they do not represent an obstacle to the development of the financial system.[97] The rates of foreign denials remain very high, further supporting the idea of substantial entry barriers and competitive advantages enjoyed by domestic incumbent banks.

In addition to the two key weaknesses summarised above, the 2011 survey points at three new concerns. Poor accounting practices have contributed to an increasing disparity in private monitoring indices. Furthermore, political interference has become a significant possibility, potentially undermining supervisory authority and reinforcing the governments' direct control – an additional concern for the competitiveness and efficiency of the banking sector (Casu & Ferrari, 2013). As the eruption of public discontent in Tunisia and Egypt in early 2011 clearly attests, the region's governments have attempted to maintain (perhaps for far too long) a tight grip on their countries' political and economic systems. It is exactly such forms of interference that may conflict with the objectives of the financial and competition authorities.

In contrast, the SEMCs have implemented a number of reforms to improve the availability and use of credit information by financial institutions. Egypt, and more recently Morocco, established private credit

[97] Rocha et al. (2010) notes the essential role that public banks fulfil in the region by providing financing to SMEs. The authors note that private banks are unable to fill this gap largely owing to the generally weak quality of the financial infrastructure, including the availability and reliability of information on potential borrowers.

bureaus in 2006 and 2009, respectively. The SEMC–EU gap has been bridged. The SEMCs' average is now above the EU-MED average. Algeria, Israel, Jordan, Lebanon and Tunisia continue to rely solely on public registries, three of which meet all the criteria except collecting credit information on retail stores or utility companies. The same applies to Turkey, which has both public and private credit bureaus. Although the literature provides little guidance, private credit bureaus have better access to new technologies and know-how to ensure that information-sharing mechanisms work effectively. The countries in the region should continue to monitor developments and spearhead innovative systems to use the stock of information and infrastructure already developed by the public systems.[98]

[98] Morocco may serve as an interesting example, by effectively combining the data-collection roles and capacities of the Bank Al-Maghrib, which operates the public registry, with the newly established private credit bureau, Experian-Morocco. For a comparative analysis of the Moroccan and Egyptian credit information systems, see Madeddu (2010, pp. 21-23).

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7. CONCLUSIONS

The global financial crisis dealt an exogenous shock to the southern and eastern Mediterranean countries (SEMCs), which was primarily reflected in their balance of payments and then transmitted to the rest of the economy. While the economic slowdown has been modest, this group is also likely to experience a slow recovery, further hampered by the regional political instabilities brought on by the Arab spring. Limited external financing, little space for fiscal stimulus, a real appreciation of most domestic currencies, sluggish receipts from tourism and remittances, and increasing food and energy prices in the future will all continue to be a drag on growth for some time. Thus, the weaknesses in the short term will persist, largely affected by the slow improvement in the world economy.

This concluding chapter outlines the most salient results of the research. The policy implications and recommendations are elaborated in Ayadi & De Groen (2013), who provide a comprehensive matrix of crisis transmission channels and policy responses to tackle the key vulnerabilities.

On the external sector. A slowdown in exports might continue as long as growth and unemployment figures for trading partners remain gloomy. Tourism and remittances have proved resilient so far, but with the global recession persisting and wealth effects settling in, countries in the region might not be able to sustain higher GDP growth. In fact, the resilience shown by remittances may be due to the fact that migrants have lost their jobs and returned home with their stock of accumulated savings, which helps to compensate for the reduced flow of remittances. But in the coming period, this compensation might come to an end as it is a one-time event. Similarly, global FDI flows fell sharply and SEMCs will continue to be directly affected by this trend. Competition to attract FDI will become even tougher as countries in the region continue to experience a downgrading trend as a result of political instabilities.

On the real sector. The repercussions of the crisis continue to reverberate from the balance-of-payments to the real economy. Since external demand declined sharply, enhancing domestic demand remains the only way to

enhance growth, at least until trading partners show sustainable economic recovery. The lack of modern infrastructure to raise the region's competitiveness and take full advantage of the growing global manufacturing and services trade can also pose a risk for investments and growth.

On the monetary sector. With the decline in interest rates and inflation worldwide and also the decline in inflation in all the sampled countries, there seems to be room for adopting an expansionary monetary policy through decreasing interest rates to stimulate domestic demand.

On banking and capital markets. Most of the SEMCs have been saved from the negative impact of the crisis during the initial phase of the crisis between 2007 and 2008. Banks in the region had little direct exposure to the toxic products that weakened the balance sheets of many banks in the US and the EU. However, the main impact of the global financial crisis came later, during 2009 and onwards. As economic conditions in the EU – the region's main partner – worsened, so did the external demand for the region's products, leading to severe drops in exports, tourism receipts and remittances in the SEMCs. In addition, bouts of risk-aversion among global investors lowered capital inflows. The economic stimulus programmes of the local authorities did not succeed in offsetting these reductions in capital inflows. Moreover, higher international commodity prices were even severely worsening the fiscal problems in several of the SEMCs.

The impact of the financial crisis on the banking systems assessed by pre- and post-crisis comparisons of the liquidity, performance, efficiency and fragility showed divergent impacts between countries. Overall, the results underline that the impact of the financial crisis on the banking sectors in the SEMCs was very limited. The more developed banking sectors of Israel and Turkey were the only exceptions. In Israel both performance and efficiency deteriorated, while the system became more fragile. In Turkey both liquidity and performance worsened and the banking system became more fragile.

The impact of the financial crisis on capital markets varied from country to country. In particular, as of November 2012, the Israeli, Tunisian and Turkish stock exchanges had outperformed the US Dow-Jones index during the global crisis. At the same time, the Egyptian, Jordanian, Palestinian and Syrian indices remained below their January 2007 levels. The correlation coefficients between the region's stock markets and commodity indices highlight several interesting findings. The results show that the correlations clearly increased in Israel, Turkey, the US, and Europe after the crisis (up until the ousting of Mubarak). The same is also true only

for grains in Egypt, especially after the onset of the Arab spring uprisings. The correlation with grains also increased in the post-crisis period, up until January 2011, for Palestine. The correlation of the market returns with Brent oil increased in Jordan, but only weakly so. The correlation of the market returns with the US and EU markets highlights a close relationship between these countries. Clearly, the correlation with the US and EU is extremely strong for Egypt, Israel and Turkey. The results show that the relationships have not increased after the crisis for most cases, except for Egypt (with the US only), Tunisia (only weakly) and Jordan (relatively strongly so). Even though Israel's and Turkey's stock markets display the closest interdependence with both the EU and the US, the relationship has not become more sensitive after the crisis or the ousting of Mubarak.

As for the fiscal, monetary and financial policy responses, post crisis:

On fiscal sustainability. The research reveals several vulnerabilities of the Tunisian and Egyptian economies that clearly undermine their debt sustainability. One important conclusion from the debt sustainability scenario analysis performed is that political instability has significant implications on debt sustainability. Political stability is crucial for investments – both domestic and foreign – in Egypt and Tunisia. With political uncertainty, investments will decline, remain low and will take time to pick-up. This means lower production (lower GDP), which might also translate into higher unemployment (as the population and the labour force increase every year). Lower production also means lower profits for investors and lower income for workers, leading to lower revenues for the government. As we have seen from their budgets, tax revenues are forecasted based on highly optimistic assumptions that do not really take into account the possibility for a lower level of private investment and therefore lower level of tax revenue. The direct implication of such an optimistic assumption is an increase in the budget deficit and in the debt ratio, beyond the level the government expected. Another implication of the political instability is the loss of trust on the part of the international community in political transitions. This can lead to downgrades of the countries' credit ratings and an increase of their interest rates for borrowing on the international markets. This can also make it much more difficult for the government to finance its deficit or to refinance its existing debt, putting further pressure on debt sustainability.

A second important conclusion is related to expenditures. Indeed, the revolutions demanded more social justice and more employment opportunities, but increasing current expenditures would be one big mistake. Any government that is freshly elected, and seeks re-election or more power, would be tempted to increase wages and increase hiring in

the public sector to satisfy the population. Such an action, however, would have dramatic implications for the future and would be a heavy weight to bear for years to come. The situation in Tunisia is much better than in Egypt, where the deficit and the debt ratio are already very high, but the implications for debt sustainability are the same.

Finally, it is clear that the exchange rate could be a factor in debt sustainability. On the one hand, maintaining a fixed exchange rate at an overvalued level is harmful for the whole economy and is obviously unsustainable. On the other hand, the devaluation of the currency can lead to serious implications for debt sustainability. Tunisia is again much healthier than Egypt. The sharp decline in the official reserves in Egypt, combined with an appreciation of the real effective exchange rate over the past 10 years, reflect the urgent need for an exchange-rate correction. The recent depreciation is a step in the right direction, but the continuous interventions from the Central Bank are both irrational and harmful. The Gulf countries' deposits in the Egyptian Central Bank are absorbed by the market right away, leading to the need for more borrowing. The mismanagement of the exchange rate in Egypt is only leading to higher debt without any stabilisation of the market. Therefore, and in the absence of alternatives, the government should authorise the Central Bank to allow the exchange rate to float and depreciate. This will increase the debt ratio, indeed, but it will avoid accumulating more and more foreign debt, and ultimately having to devalue the pound, resulting in an even higher debt.

On monetary policy. There appears to be homogeneity in the operational framework followed by central banks, despite some differences in the specificities. Although price stability was announced as the final objective of the unconventional measures, errors in the monitoring and controlling of the interest rate forced monetary authorities to shift the intermediate objectives to targeting money supply and credit aggregates. The specificities are mainly visible in the oil-exporting countries (i.e. Algeria and Libya) that followed restrictive monetary policies controlling the monetary base to absorb the structural excess liquidity in the banking system. In the other countries, monetary authorities have adjusted their key policy interest rates to maintain positive real interest rates. In general, the low interest rates in combination with a broad range of monetary policy instruments revamped economic growth in most of the countries, except for the crisis countries (i.e. Tunisia and Egypt).

Low operational independence and a slow adjustment characterise the formal procedures that central banks in the region, with the exception of Turkey and Morocco, use to target inflation. Excessive use of subsidies and price controls seem to be the main obstacles to adopt explicit inflation

targets. Turning to exchange rate policy, monetary authorities in a floating exchange rate regime in general target the real effective exchange rate, whereas they aim at a constant nominal exchange rate, if the currency is pegged or linked for example to the dollar or SDR.

While inflation in these countries usually depends on international energy and food prices as well as domestic tensions and demand, thorough econometric analysis suggests that inflation is determined by a combination of the items above and the monetary transmission channels.

However it appears that the adjustment mechanism of the interest rate is relatively weak, or the interest rate is slightly volatile in response to price fluctuations. In turn, active control offsets inflation corrections. Hence, the central bank interest is thus more important for exchange rate stability than the real stability.

To conclude we recommend the establishment of a (systemic) risk management system. In this context, an early warning system (EWS) and effective early prevention system was implemented in Tunisia to prevent systemic risks and crises. The system allows to: i) decompose the impact of shocks on the real economy and financial markets and ii) identify early warning indicators or estimate a binomial Probit model. These leading indicators have been grouped into three blocks related to i) macroeconomic resilience factors, ii) factors weakening bank (CAMELS accounting ratios) and iii) macro-prudential factors indicating the soundness of financial systems.

The results of the econometric analyses have generally shown that the early warning system clearly indicates that, in addition to the actual obvious effects, the probability of a negative impact of international financial crisis seem explained by the mechanisms of monetary contagion, i) the risk of deteriorating terms of trade, ii) the risk of over-appreciation of the real effective exchange rate, iii) the swelling of compromised bank accounts and incidentally iv) excessive use of central bank refinancing.

On banking policy. The collective assessment of the regulatory and supervisory structures of the SEMCs in comparison with the EU-MED standards pre- and post-crisis gives a mixed picture. Despite some improvements, key weaknesses remain in deposit insurance, entry obstacles and legal rights. Moreover, some disparities have also become more apparent, especially in the potential for political interference and private monitoring.

The deposit insurance index has failed to improve between 2007 and 2013, because the Egyptian, Israeli, Palestinian, Syrian and Tunisian authorities have chosen not to put in place an explicit insurance scheme.

Implicit schemes may enhance risk-taking through a blanket government guarantee for the leading institutions. In addition, in Algeria, Jordan, Lebanon and Morocco, no effort has been made to align the banks' incentives by implementing risk-based premiums or co-insurance schemes, which would help internalise some of the costs to the deposit guarantee schemes that stem from excessive risk-taking.

Another major issue, the presence of entry obstacles, continues to be a key weakness in the regulatory structures of the region. Although the licensing requirements exhibit similarities in all countries bordering the Mediterranean, other indicators point at substantial barriers to entry. Government ownership, which is widespread in the region, gives undue advantages to incumbent banks and restricts entry incentives. In Algeria, Egypt and Syria as well as to some extent Morocco, Tunisia and Turkey, government ownership remains significant. Although government ownership may have some benefits, the authorities have to ensure that such roles are well-defined within a national strategy with clear objectives and instruments, and that they do not represent an obstacle to the development of the financial system. The rates of foreign denials are also still very high, further supporting the idea of substantial entry barriers and competitive advantages enjoyed by domestic incumbent banks.

In addition to the two key weaknesses summarised above, the 2011 survey points at three new concerns. Poor accounting practices have contributed to an increasing disparity in private monitoring indices. Furthermore, political interference has become a significant possibility, potentially undermining supervisory authority and reinforcing the governments' direct control – an additional concern for the competitiveness and efficiency of the banking sector (Casu & Ferrari, 2013). As the eruption of public discontent in Tunisia and Egypt in early 2011 clearly attests, the region's governments have attempted to maintain a tight grip on their countries' political and economic systems. It is exactly such forms of interference that may conflict with the objectives of the financial and competition authorities.

In contrast, the SEMCs have implemented a number of reforms to improve the availability and use of credit information by financial institutions. Egypt, and more recently Morocco, established private credit bureaus in 2006 and 2009, respectively. Algeria, Israel, Jordan, Lebanon and Tunisia continue to rely solely on public registries, three of them meeting all the criteria except collecting credit information on retail stores or utility companies. The same applies to Turkey, which has both public and private credit bureaus. Although the literature provides little guidance, private

credit bureaus have better access to new technologies and know-how to ensure that information-sharing mechanisms work effectively.

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