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CREDIBILITY OF INFLATION
TARGETING IN MOROCCO AND TUNISIA

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Abstract

Can the Moroccan and the Tunisian financial systems withstand the consequences of adopting IT, and is IT the appropriate monetary policy for them? There are many crucial requirements for the success of IT including independence of the central bank, fiscal discipline, a flexible exchange rate, and a strong and transparent financial system. Most of these requirements are actually important for any sound monetary policy. Not all of them are readily fulfilled in Morocco and Tunisia, some may be achieved gradually, eventually over a transition period, but there are some crucial prerequisite conditions that are not fulfilled. Absence of fiscal and financial dominance is one of them, and there are many other features not consistent with IT. We argue that, in spite of the many reforms they implemented Morocco and Tunisia fiscal and financial systems are not yet adequate for IT; in particular, the NPL problem undermines their effectiveness. The success of IT also depends on some institutional conditions that seem currently hard to meet, namely the government ability and willingness to establish a credible system ensuring fiscal and monetary discipline and central bank independence. Under the current conditions the government and the monetary authority may be reluctant to move to IT. The paper also presents a fairly simple dynamic simulation model taking into account some basic and specific features of the Moroccan and Tunisian systems. The simulations show that IT under the fragile current system may destabilize the economy and the target is likely to be missed when important exogenous (eventually external) shocks occur.

ملخص

هل يستطيع النظام المالي المغربي والتونسي أن يصمد أمام تبعات تطبيق سياسة استهداف تحجيم التضخم, وهل هذه السياسة هي السياسة النقدية المناسبة لكل منهما؟ هناك العديد من المتطلبات الأساسية لنجاح هذه السياسة مثل استقلالية البنك المركزي و الانضباط المالي ووجود نظام مرن لسعر الصرف ونظام مالي قوى وشفاف. وفى الواقع, فإن معظم هذه المتطلبات مهمة بالنسبة لأي سياسة نقدية سليمة. ولا تتحقق كل هذه المتطلبات بسهولة في المغرب وتونس, فالبعض قد يتحقق تدريجياً وقد يتحقق في النهاية خلال فترة انتقالية, ولكن هناك بعض الشروط الأساسية المستقلة التي لم تتحقق مثل غياب السيطرة المالية والضريبية وهناك العديد من السمات الأخرى التي لا تتسق مع سياسة استهداف تحجيم التضخم. وبالرغم من الإصلاحات الكثيرة التي قامت بها كل من المغرب وتونس فان أنظمتهما المالية والضريبية ليست كافية لتطبيق سياسة استهداف تحجيم التضخم وخاصة أن مشكلة القروض غير العاملة تقوض فعاليتها. وكما يعتمد نجاح سياسة استهداف تحجيم التضخم على بعض الشروط المؤسسية التي يبدو من الصعب استيفائها فى الوقت الحالي مثل استعداد الحكومة وقدرتها على ,وضع نظام جدير بالثقة يضمن انضباط مالي ونقدي واستقلالية البنك المركزي. وفى ظل الظروف الحالية ربما تكون الحكومة والمؤسسة النقدية محجمة عن الانتقال لتطبيق سياسة استهداف تحجيم التضخم. كما تقدم هذه الورقة نموذج محاكاة بسيط يتسم بالديناميكية إلى حد ما مع الأخذ في الاعتبار بعض السمات الأساسية والمعينة للنظامين التونسي والمغربي. ويبين النموذج أن تطبيق سياسة استهداف تحجيم التضخم في ظل هشاشة النظام الحالي قد يؤدى إلى زعزعة استقرار الاقتصاد مع احتمال ضياع المستهدف عند حدوث صدامات خارجية مهمة

Introduction

The design of monetary policy for countries such as Morocco and Tunisia remains a major unresolved and urgent issue. These two countries are increasingly integrating globally and are more likely to face stronger external shocks. Starting in the mid 1980s, they implemented important financial and monetary reforms and managed to bring down inflation from over 10% in the mid eighties to less than 3% in 2005. They have announced that inflation control is one of their major monetary policy objectives but their monetary policy does not seem to have any clear cut objective and strategy yet. At this stage alternative monetary policies are considered, and even though both countries have not adopted a full-fledged inflation targeting (IT) regime, IT is on the table and is considered an option.

Can the Moroccan and Tunisian financial systems withstand the consequences of adopting IT, and is IT the appropriate monetary policy for them? Are the economic and institutional conditions required for IT fulfilled in Morocco and Tunisia? This issue has been dealt with for emerging countries in general (Mishkin 2004) but very rarely for these two countries (Boughrara, 2004) or for similar countries of the region.

IT **(**Mishkin, 2002) is a monetary policy with a fundamental goal of keeping the inflation rate (suitably defined) close to a certain target level that is chosen in advance and explicitly and publicly announced as the primary Central Bank target. Such a policy allows for the inflation rate to fluctuate around its target and within a reasonable band, and hence, allows the central bank some flexibility to help the economy deal with other objectives, for instance with periods of deflation or with stabilizing the exchange rate. There are many crucial requirements for the success of IT including independence of the Central Bank, fiscal discipline, a flexible exchange rate, and a strong and transparent financial system. Most of these requirements are actually important for any sound monetary policy. Obviously not all of them are readily fulfilled in Morocco and Tunisia. Some may be achieved gradually, eventually over a transition period, but there are some crucial conditions that have to be fulfilled prior to any final commitment to move to IT. Absence of fiscal and financial dominance is a major prerequisite, and it is a fact that their financial and fiscal systems remain rather fragile. The multiplicity of objectives assigned to the central bank, which characterizes their current monetary policy, is not consistent with IT either. These signals suggest that Morocco and Tunisia do not fulfill the conditions for IT.

We will argue that, in spite of the many reforms they implemented, their fiscal and financial systems are not yet adequate for IT. Banks dominate the financial system and remain fragile, and their NPL problem undermines their effectiveness in performing their role as the most important channel of financial intermediation and monetary policy transmission. Under such conditions the monetary authority may be reluctant to commit itself to IT. The success of IT also depends on some institutional conditions that seem currently hard to meet, namely the government's ability and willingness to establish a credible system ensuring fiscal and monetary discipline and central bank independence. The limited knowledge about the monetary transmission mechanisms (MTM) characterizing these countries is another handicap which might delay the adoption and implementation of IT.

The rest of this paper is organized in four sections. The first section briefly presents the conditions for IT, section 2 examines the extent of which these conditions are, or may be, fulfilled. Section 3 presents a fairly simple dynamic simulation model taking into account some basic and specific features of the Moroccan and Tunisian systems. The simulations are presented in Section 4 but they are performed with Tunisian data only. Section 4 also concludes.

1. The Prerequisites for Inflation Targeting

There is a consensus between economists and central bankers[1] that in order to successfully implement IT, a country must fulfill a set of preconditions. Some of the studies that have dealt with this issue divided these conditions into institutional and economic conditions. In what follows, we briefly review the most important ones.

1.1. The Institutional Conditions

The fundamental institutional requirements of IT are independence of the central bank, accountability and transparency, and the development of the financial system.

The Central Bank must be independent in order to freely adjust its instruments of monetary policy toward the objective of low inflation.

Some economists (see among others, Grilli, Masciandro and Tabelli, 1991) have divided the concept of independence into political and economic independence, and some other economists have divided it into goal and instrument independence. This latter dichotomy is the most widespread in the economic literature (Debelle and Fischer, 1994). Goal independence reflects the central bank's freedom to determine, given the specific circumstances and the strategy adopted by the government (legislators and executives), the objectives which should be given priority. It is commonly admitted that central bank independence in this sense would be easier to implement when price stability, or any other single objective, is explicitly stipulated in the central bank charter as the first priority (Fischer, 1994). Central bank independence requires instrumental independence in the first place; which means that greater discretion in the conduct of monetary policy is attributed to the central bank. In particular, the central bank can decide to finance or not to finance the government budget when it is asked by the government to do so. In the same manner, the central bank should not be required to apply special low interest rates on public debt or to maintain a particular nominal exchange rate. There should not be any political pressure on the central bank to target a higher growth rate or any objective other than the achievement of the inflation target (Debelle and Lim, 1998); or more realistically, the central bank should have enough power and strength to resist any external pressure whenever it is necessary. Thus, what is essential is the central bank's freedom to choose the means by which it seeks to achieve the goals assigned to it.

The second institutional condition is accountability. A central bank, once given the autonomy and the means to accomplish its specified task has to become accountable for its actions to the public and to its elected representative, concerning the successes and failures of its policy. The public must have the capacity to punish incompetent policymakers. Indeed, making policymakers subject to punishment makes it more likely

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[1] Masson et al (1997), Taylor (2000), Mishkin (2002), Siklos (2002), Siklos and Abel (2002), Bernanke et al. (1999).

that incompetent policymakers will be replaced by competent ones, and creates better incentives for policymakers to do jobs well (Mishkin, 2002). In order to ensure accountability, periodic reporting requirements to the government and to parliament[2] should be instituted.

Accountability must be accompanied by the communication of the monetary policy decisions in a clear and regular manner to the financial markets, to policy makers and to the public. Consequently, it requires greater transparency, which could be defined or conceptualized in the form of well defined central bank publications and forecasts. Transparency should focus on the policy analysis and the operational objectives of the central bank. Increased bank transparency is desirable because it reduces uncertainties in financial markets, the inflation bias and inflation and employment variability (Faust and Svensson, 2001). A transparent monetary policy means that changes in short-term interest rates should not contradict the expectations of the market. It is important that the central bank enhances transparency for the effective operation of an IT framework. Transparency introduces predictability and helps to ensure that expectations are consistent with the objective of price stability; thereby, it permits to lower the cost of achieving the inflation target. Nonetheless, there should be a limit on the transparency requirement; a very high degree of transparency is not desirable. Beyond a certain degree, increased transparency may have the disadvantage of eliminating the central bank's strategic advantage and reducing its choices, and may reduce its effectiveness.

To carry out IT, the existence of well developed financial markets is important. This is a necessary condition for financial stability and also for the central bank to pursue an independent monetary policy. A well developed market makes it possible to use indirect instruments; otherwise the effectiveness of the monetary policy would be reduced, leading to a delay in the impact on inflation. It has been shown that the most serious economic contractions arise when there is financial instability (Mishkin, 2002). Traditionally, to prevent financial instability, central banks act as a lender of last resort by supplying liquidity to the financial system. Such a practice may encourage some institutions to take excessive risk favoring further their financial instability. To avoid this risk, central banks should dispose of precise information about the institutions to which it might have to extend loans.

1.2. The Economic Conditions

The existence of a well developed financial system is an institutional condition and an economic condition as well. Actually, the other economic conditions also have institutional aspects. It is so with the conditions concerning the exchange rate regime, fiscal dominance, the technical ability to forecast inflation and inflation related variables and mastering the monetary transmission mechanisms (MTM).

The Exchange Rate Condition

IT cannot succeed unless a **flexible exchange rate regime** is put in place. The absence of any targeted nominal variable, other than the inflation rate, such as wages, level of employment or nominal exchange rate is a prerequisite for IT. **This means simply that**

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[2] The need for central banks to be accountable provides an additional reason why they should have explicit nominal anchors. If there is no nominal anchor, it is far less clear upon what criterion the central bank should be judged, and consequently it is harder to hold it accountable.

there should be a sole main target within the system. If a country chooses a fixed exchange rate system, it will be unable to reach its inflation target and exchange rate target at the same time. Because in the presence of capital mobility, the exchange rate target subordinates the monetary policy to its requirements and leads to a deviation from the targeted inflation rate. On the other hand, having more than one target may destroy the credibility of the central bank, given the conflicts between objectives. However, emerging countries often have greater concerns about this issue compared with industrialized countries. According to some economists (Mishkin, 2002 and 2004), the flexibility condition may be limited and some importance might have to be placed on the exchange rate objective.

Fiscal Dominance

There is a wide consensus among economists that fiscal dominance may hamper the conduct of an independent monetary policy. Fiscal dominance means that high pressures are put on the monetary policy to finance the government fiscal deficit. Fiscal dominance is in practice narrowly related to other factors, namely a shallow capital market, a fragile banking system, insufficient fiscal resources, an ineffective fiscal administration and the lack of central bank independence. All these factors are in fact inter-related. The fiscal non-dominance signifies that central banks do not have to conduct accommodative policies. The weights of public sector borrowing requirements on the financial system must not be so high, and there should not be direct borrowing of public sector from the central bank or heavy reliance on seigniorage revenues, which is the most common indicator of fiscal dominance. If these conditions are not satisfied, the fiscally driven inflation process undermines effectiveness of the monetary policy. Furthermore, fiscal imbalances can also lead to banking and financial crises that may erode all chances of controlling inflation. Large budget deficits may force the government to confiscate assets available within the banking system (Mishkin and Savastano, 2001). Such practice would force banks to rely on central bank loans and may cause depositors and other creditors to pull their money out of the banking system because of the suspicion. The resulting banking crisis would then also cause a contraction of lending and of all economic activities[3]

The MTM

The existence of a stable relationship between the inflation outcomes and monetary policy instruments is another requirement for IT. Monetary authorities have to be able to model inflation dynamics in the country and to accurately forecast inflation. They should also know how monetary policy affects nominal and real variables. In other words, central banks should have enough knowledge about the MTM, especially the time lag involved between a policy and its impact on inflation and output. This requires sufficient data, sophisticated models and computational facilities.

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[3] This happened several times in Argentina, with the most recent variant of this mechanism occurring in 2001.

2. Are These Requirements Fulfilled in Morocco and Tunisia?

2.1. Multiple Objectives Assigned to Central Banks in Morocco and Tunisia

Despite all the reforms they implemented during the last twenty years, the way the Moroccan and Tunisian governments have so far viewed monetary policy does not seem consistent with IT. They have basically shared a common view about the role of the financial system and the central bank; for them monetary policy and the financial system must be under the direct, and tight, government control. Hence, it has always seemed natural to assign a multiplicity of objectives to their central bank.

The 1958 Tunisian Law (Law 58-90), creating the Central Bank of Tunisia (BCT) states that BCT is fully owned by the government and that its mission is to control money supply and credit, to supervise all banks and all of Tunisia's financial system, to defend the value of the national currency, the Tunisian Dinar (TND) and insure its stability and also to support the government's economic policy. Similarly for the central bank of Morocco, Bank AlMaghrib, (BM) created in 1959 (law 1.59.233), is fully owned by the government and has basically the same multiple objectives: to help the government achieve its social and economic objectives, to insure the stability of the national currency and its convertibility, to stabilize the money market and to maintain a stock of gold or foreign exchange convertible into gold equivalent of one ninth of the total amount of national currency in circulation. Moreover, Morocco has a rather pegged exchange rate and thus, BM is to choose an inflation rate according to that of its major trade partner, the European Union.

Obviously, neither BCT nor BM would be able to achieve all their objectives at the same time. These objectives leave little room for the central bank to conduct any independent monetary policy and may force it to use one instrument to achieve multiple objectives.

2.2. Independence of the Central Banks

Different experiences in the two countries are probably responsible for some differences in the governance structure of their central banks, but basically the two banks are not independent enough.

The governor of BCT is appointed by a government decree and is responsible for managing all bank affairs. The Governor may be assisted by a council whose members are totally appointed by the government. Six of its ten members, including the governor and the vice governors, are government officers. The other four are chosen by the government for their professional experience. Likewise, the governor of BM is appointed by the government and is assisted by a vice governor and by a council whose thirteen members are all appointed by the government. Six members represent different government departments, and the other five members are known for their professional expertise in monetary, economic and financial matters and cannot exercise functions of any kind in any other credit institution. The distribution of controls clearly favors the government and gives it a monopolistic power, which casts a serious doubt on the independence of the central banks. Moreover, the Moroccan law requires BM to consult the council in matters relating to the design and conduct of monetary and credit policy, which might hinder monetary policy and tie its hands even further.

Given this institutional and governance set up, Morocco and Tunisia have very limited autonomy in terms of goals, and instruments for the central bank to use. This will become clearer through analyzing their current monetary policies.

2.3. Monetary Instruments

The banking laws in both countries provide the central bank with a variety of instruments but most of them are in fact intermediate instruments that serve to control the money supply.

In Tunisia

BCT and its council are empowered by law to decide the interest rate applicable to the purchase and resale of securities by the central bank to the country's banks (the TAO[4]), and the conditions of eligibility of securities or commercial papers for discounting, or for purchase and resale. Alternatively, it may fix the amount of money it intends to provide to or withdraw from the banks.

Controlling money supply has been the backbone of Tunisian monetary policy for the last two decades. To this end, the main instrument is to inject or withdraw more central bank money according to the gap observed between the liquidity level within the money market and the target level. To this end, several procedures are applied. The main procedure is through competitive tenders over credit lines opened to banks for up to three months; these lines of credit are renewable for a maximum of two times. BCT can also make shorter term, overnight or one week advances to banks at a higher interest rate (one full point or 100 base-points).

The procedure for competitive tenders is as follows. First, BCT decides the amount of money to supply or withdraw and then it asks all the banks to express their demand. The law allows for two methods, either that BCT asks banks to specify the amount of credit and interest rate they are willing to pay, or BCT maintains the previously applied interest rate and asks banks to specify only their demand for central bank money. The latter method has been followed by BCT since the mid nineties, and consequently the central bank interest rate has seldom changed for years. This amounts to a de facto control of the short term, and indirectly, the long term interest rates.

BCT credits may be secured by either government or private securities as determined by the BCT council policy. The law endows the BCT council with the power to specify the conditions of admissibility for discount of non government securities but the process is still ad-hoc and shrouded in secrecy, and nothing ensures that the BCT would not discount worthless paper, and there is little that BCT can do when the borrower is insolvent. BCT continues to do so in order to exercise quantitative control on the amount and distribution of total credit in the country, and continues to respond to the request of the banking system which is dependent on its resources.

In order to avoid the risk linked to discounting excessive amounts of government bonds — that is the risk that government may consider money printing as a major source of income — articles 48 and 50 of the Law 58-90 specify that the maximum total amount of discounting and line of credit granted by BCT on the security of government bonds is

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[4] TAO stands for "taux d'appel d'offre".

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10% of government revenues during the preceding year. However, at 10% this is not really a very binding constraint.

Furthermore, BCT is empowered to grant advances to the government treasury for a total period not exceeding 240 days and a total amount not exceeding 5% of government revenues during the preceding year, but this option has not been recently in use.

In Morocco

BM also marshals a variety of sub-instruments in order to control money supply, which is again its main instrument. Like in Tunisia, it can discount, accept for purchase and resale government securities and commercial paper. It can make loans or provide lines of credit on the security of commercial paper or government bonds. Articles 28 and 29 of the Moroccan law 1-59-233 require that the commercial papers involved must mature in less than 120 days from the date BM acquires them and bear the signatures of three (two for agricultural or industrial commercial paper) well known and solvent physical or moral persons. Furthermore, Article 31 of the same Law allows it to discount medium term commercial paper maturing in less than five years when used to develop means of production, equipment or exports and must bear the guarantee of three moral or physical persons.

The government is aware of the risk of its addiction to inflationary finance. Accordingly, although BM is allowed to provide a line of credit to the government, its article 35 also restricts the maximum amount to 10% of government revenues in the previous year. Unlike the case of the Tunisian central bank, BM can provide other credit facilities to the government sanctioned by a decree.

Both the Tunisian and Moroccan governments have sought to encourage economic development by allowing their central banks to facilitate credits to finance government and private investments with little concern for prudential requirements. Safeguards are present in the statute of the Moroccan and the Tunisian central banks but the fact remains that banks, especially public banks, ended up with a huge volume of NPLs. Moreover, these central banks are not endowed with the means to maintain an adequate level of transparency and accountability as required for inflation targeting.

2.4. Oversight, Transparency and Accountability of the Central Bank

BCT and BM are accountable only to the government. The government owns the central bank and is allowed to use it according to its development plans. Although the Tunisian and Moroccan governments had a certain respect for the stability of the macroeconomic environment they have kept the central bank within their domain; and accordingly, they had reserved for themselves the power of management and oversight of central banks. There are auditors but their role was to check the accounting practices of the central banks, and the amount of information provided to the public concerning monetary policy was meager and limited to the publication of vague comments on financial and monetary aggregates, prices, economic growth and exchange rates. Very little is published on the conduct of monetary policy. The central bank has not been accountable to the public in the matter of monetary policy. The Tunisian law 58-90 requires that the council publishes a short statement every month. Currently, the council's statement describes the growth rates of economic activity in the rest of the world and in the key sectors of the Tunisian

economy, and the behavior of the major components of the balance of trade during the previous three to six months. It also describes the behavior of the basic monetary aggregates, the exchange rate of the Tunisian Dinar with respect to the Euro and the US dollar, and the behavior of the inflation rate during the previous three to six months period. Its decision about the interest rate that will be enforced in the money market during the following month is announced at the end of the statement but rarely reflecting changes in these economic indicators. Almost the same words are used to justify its decision about the rarely changing interest rate.

The auditor general monitors all BCT affairs and he is empowered to make propositions to the council. Every year, the auditor general writes an annual report on the conduct of the bank's affairs to the minister of finance. These routine auditing procedures are necessary but not sufficient and they do not help much to anchor expectations. There is no high frequency periodic accountability to the public concerning the success or failure of the central bank to achieve its assigned goals, and no information concerning the actions intended to help BCT achieve those goals in the future.

There is only a vague notion of accountability emphasizing responsible management of the affairs of the central bank. There are no explicit norms to measure BCT performance in terms of achievements of the goals of monetary policy.

The oversight process of BM is slightly different from that of BCT. The council meets every three months and records its minutes but the Moroccan law 59-233 does not require it to publish a report about its monetary policy. However, BM does publish on its website a summary of the council's discussions during its quarterly meeting with vague statements about its future intentions. An interesting but weak oversight of the conduct of monetary policy by BM is the requirement of the Moroccan law that the government appoints an officer that oversees the management of the affairs of BM. The officer is an ex-officio member of the council and he could force a second reading of any decision made by the council but he has no vote. Although, the functions of the officer seem to be concerned with accounting books and management of the daily affairs of BM, his temporary veto allows him to exercise some power of persuasion as to the conduct of monetary policy.[5] Like in the case of BCT, there is no accountability to the public about the degree of success of BM in the achievements of its assigned goals.

The Moroccan and Tunisian monetary authorities do not have to explain to the public their successes or failures to achieve their targets.

The requirement of a quantitative control on credit and its distribution, the lack of a clear performance indicator, the lack of independence from the executive branch of the government, the composition of the council, and the monotony of the council's justification of the setting of the interest rate compromise the independence of BCT and its credibility.

It took Turkey a major economic crisis in 2001 to convince its government that it needs a credible central bank with a single main objective, inflation control; which it is likely to achieve. Obviously, a monetary policy dedicated to inflation control does produce

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[5] The Moroccan law 59-233provides for two auditors, one of them is appointed by the Ministry of Finance. Their responsibility is limited to pure accounting issues of BM.

fluctuations in the interest rate and may leave room for counter cyclical interventions and for helping the economy move towards full employment. If banks are well managed, inflation control may help them reduce the incidence of non-performing loans and fight recessions. However, if banks are badly managed, inflation control would put them under severe stress when the rate of inflation increases and the interest rate has to be increased. Important banks that are badly managed are likely to lobby the government for relief through any possible open channels and to undermine the functioning of the monetary policy. Higher short term interest rates to reduce inflationary pressures are likely to hurt harder banks that have a high proportion of nonperforming loans.

2.5. Soundness and Supervision of the Banking System

The banking system is the backbone of the financial system in both countries, which has been dominated by the nationally owned banks. Reform programs, including efforts to privatize government owned banks, have produced differences in the structures and supervision of the two banking systems. With respect to supervision and oversight, the current power of the central bank does not fully satisfy certain core principles of the Basel Committee on Banking Supervision.

The Tunisian Banking System

In July 2001, the Tunisian government introduced a new banking law, Law 2001-65, probably intended to strengthen bank supervision and to help banks deal with the new economic and regulatory environment. Prior to 1995, BCT and the ministry of finance in Tunisia controlled on behalf of the government almost every aspect of bank credit and management, and banks were required to invest various proportions of their deposits in support of economic activity in various sectors that government designated priority sectors. The new law removed most of those restrictions and replaced them by new ones, but the government maintained its control on many important banks.

Although one of the goals from these new restrictions was to improve the quality of management of banks and to insure that banks balance sheets satisfy some of the core principles of the Basel Committee on Banking Supervision, not all these principles are satisfied, in particular regarding capital requirements and the independence of the supervisory and licensing body. Law 2001-65 invests the minister of finance with the decision of fixing the minimum capital requirement and licensing. It also requires the management of every bank to maintain the value of its assets after deflating them by appropriate risk factors higher than the total value of its liabilities by an amount greater or equal to its minimum paid in capital. Article 21 of the law prohibits a bank from investing more than 10% of own funds to acquire interest in the same non financial business. It prohibits a bank from owning directly and/or indirectly more than a 30% share of the capital of a non financial institution and of engaging in businesses other than banking. However, Article 21 allows a bank to own any share of the capital of another financial institution. Clearly, the goal of these restrictions is to enhance transparency, prudential management while allowing room for mergers among banks and other financial institutions. According to principle 5 of the Basel Committee on Banking Supervision, a merger or acquisition of any kind should be subject to approval by an independent supervisory body. Therefore, article 21 is not consistent with this principle.

Undoubtedly, the new regulations represent significant enhancements to the transparency and prudential management of banks compared to the situation before 2001. However, the Tunisian economy could benefit more from bringing the regulations of the financial system completely in line with the recommendations of the Basle Committee.

It is precisely for this reason that, although BCT claims that the interest rates on all credit is determined freely by the banks, BCT continues to control credit indirectly and links all interest rates to its "guiding rate", the TAO that BCT enforces and maintains constant in the money market.

The Tunisian law 2001-65 invests BCT with the power to obtain all information about all aspects of the financial situation of any credit institution. BCT can request any credit institution to provide it with information on any of its activities or financial position. BCT can also demand to examine the books of any credit institution on the spot and may require an audit of any bank's book by an outside auditing firm.

One may think that these powers should have insured that every credit institution is perfectly transparent, well managed and has a small percentage of non-performing loans and adequate provisions to face any likely risk. This is not the case — as the statistics about non performing loans show — primarily because the central bank is not independent and, hence, does not use all its legal powers, and the regulations do not ensure that the banking system has the right incentive to avoid non performing loans and is shielded against excessively risky borrowers, who include private firms and public institutions.

The Moroccan Banking System

In Morocco, three conglomerate banks dominate the privately owned component of the financial system. Thus, there is very little competition and transparency in the system [IMF, (2003)]. Moreover, there are three unhealthy major state controlled banks.

In Morocco, all credit institutions, including banks, must be joint stock companies. Banks are subject to oversight by the minister of finance and BM. The minister of finance fixes the interest rate on loans and their duration in view of encouraging economic development and protecting depositors and borrowers. The Moroccan banking law vests the ministry of finance with the authority to make the prudential rules and ratios with which bank management must comply. Although the intent of these rules is similar to that of the Basel core principles, the banking regulations in Morocco do not satisfy all the principles since it is the minister of finance that makes the rules and enforces them but not an independent institution.

The Moroccan banking law requires that a bank's balance sheet must also satisfy various ratios and prudential rules. For example, the value of every bank's assets must exceed at every moment the value of its total liabilities by an amount greater or equal to its minimum paid in capital, and, in order to avoid conflict of interest and improve transparency no executive member of a credit institution can also have management duties in any non-financial institution.

BM is the supervisory agency of banks in Morocco. The law requires BM to make spot checks on banks to protect depositors and the reputation of the banking industry. When BM discovers anomalies that might cause serious damage to the solvency of a bank, and

if the bank's problems are not resolved in a reasonable amount of time, BM may demand from shareholders who own more than 5% of the bank shares and all members of the board of directors of the bank to contribute the necessary financial support.

2.6. Protection of Depositors

It was a basic and widely admitted principle that proper protection of depositors was necessary to encourage savings and make them available for entrepreneurs to invest in new technology and stimulate economic development. The governments of Morocco and Tunisia were aware of the need to protect depositors in a system that is not subject to independent supervision. The Moroccan and the Tunisian governments remained attached to the principle that Japanese economists call the convoy system principle: all ships in a military convoy must support each other. The disadvantage of this principle is that it leads to a moral hazard situation as banks have less incentive to be prudent. The convoy system requires the central bank, as the lender of last resort, to pay for the mismanagement of banks. Alternatively, if banks were subject to a risk weighted fee, there would be less moral hazard and bank management would be eager to be transparent and to reduce non performing loans. This is important for the conduct of a monetary policy under IT. We know that it is possible to completely and safely abandon the convoy system; in 2001, the Turkish government for instance did abandon it, and introduced a full deposit insurance financed by risk based fees.

The Moroccan government introduced some reforms that generate the incentive for individual banks to be partly responsible in their lending practices but did not abandon the convoy system. The Tunisian Law 2001-65 (article 31) specifies that all credit institutions must form an association called APTBEF[6] and should offer its solidarity in case any of the association members becomes insolvent, this association being really under close government control. Article 41 of the same law imposes on all banks to be guarantors in solidarity of all deposits of any one or more of them that may become insolvent for any reason. BCT is responsible for organizing the mechanism of guarantee in case one of the member banks of APTBEF fails, and decides about the maximum paid to each depositor. In addition, BCT may draft the support of all non bank credit institution to protect deposits in case it suspects an impending bank failure.

Thus, it is not surprising that in public banks the ratio of non-performing loans was 24.3% in 2002 and 18% in privately held banks. World Bank (2003) states "Despite considerable improvement, commercial banks continue to be burdened with large non performing loans". It is also not surprising that according to World Bank (2003), the provisions for non performing loans remain low at 44% in 2002. This poor performance is caused by many factors; the convoy system is arguably one of them because it insures that depositors are covered and that no bank is likely to go bankrupt. It is as if all banks form a monopoly, and BCT provides the necessary support, with the added complication that the Tunisian government retains majority control of many banks.

To protect depositors, the 1993 Moroccan Banking Law, created deposit insurance called "Fonds collectif de garantie des depots". Its main purpose is to provide loans, and when a bank is placed under an external administrator. It also provides indemnity to depositors in case their bank ceases payments.

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[6] Called Association Professionnelle Tunisienne des Banques et des Établissements Financiers (APTBEF).

All credit institutions including banks must contribute to this fund at a rate not exceeding 0.25% of their deposits. In case of insolvency and liquidation of a bank, the fund pays to each depositor a maximum of MAD 50000 or the equivalent of US$ 5500 depending on the resources available to the fund at the time of liquidation. The fund is an interesting feature that we don't find in Tunisia's bank laws. However, the Moroccan system is hybrid and partially similar to the convoy system because if the fund proves to be insufficient, the governor of BM may ask the collective of Moroccan banks to make loans to the ailing bank. These loans may not be recoverable and may involve the re-capitalization of the ailing bank by the collective of banks.

2.7. Monetary Policy

Targeting the broad money growth, in addition to pursuing a highly managed exchange rate regime, has been the core of the current monetary framework for the two countries. We will concentrate here on the Tunisian experience and try to learn from it as to its readiness for IT.

As regards the exchange policy, Tunisia has followed a constant real effective exchange rate rule (CRERR) in an effort to index its nominal exchange rates to the domestic price level and to avoid losses in competitiveness. This rule is interpreted with some flexibility by BCT as it allows the real exchange rate to deviate from its target in order to smooth movements in the nominal rate. It also prevents the nominal exchange rate from serving as a nominal anchor. This exchange rate policy has been quite successful and facilitated by the fact that tourism has become increasingly important, while dependence on agriculture has declined. The absence of major terms of trade shocks and capital controls for non-residents obviously facilitated this success. It should be noted that capital transactions in Tunisia are still subject to a strong restrictions, both on the inward and outward directions.

However, money targeting has been **in principle** the main characteristic of the current monetary policy. Till 2003, an M2 growth target set based on forecasts for the rates of change in P and Y and assuming constant velocity of M2. Commitment to this policy is meant as an intermediate target for price stability. In 2003, BCT switched to targeting M3 money supply growth instead of M2 but its monetary policy design and formulation did not really change. The amounts of liquidity to be distributed by BCT through the refinancing facilities should also take into account the projected net international reserves as well as the credit requirement of the agricultural sector. These amounts need to be fine-tuned on a weekly basis in the light of the supposed financing needs of the commercial banks.

The point is that in practice, the system has not systematically operated according to the rules of the monetary targeting policy, and its targets have often been missed; the gap between M2 (and later M3) targets and observed values exceeded the 2% level in more than 60% of the time during the period 1987-2002. This gap even exceeded 8% during the years 1988, 1996 and 1999, which means that BCT targets did not provide optimal guidance to economic agents regarding expectations over the economy (Boughrara, 2004). BCT derives its targets on the basis of its staff experience, which is not enough. As a matter of fact, it has always published the intermediate targets months late behind

their schedule. All of this obviously weakens the system credibility and the impact of the announcements on the public's expectations.

BCT policy was indeed driven more by the fear of financial system instability and by the government needs, given its economic development strategy. Consequently, banks had to supply credits to priority sectors, and BCT often had to meet requests for liquidity put forward indirectly by the government through commercial banks, regardless of its targets.

Also as a result of the fear of instability and to facilitate the financing of the fiscal deficit, BCT preferred to maintain a stable interest rate all over the money and financial markets. Stability of the interest rate is obtained through the coordination between fiscal and monetary policy. The coordination process shows that monetary policy is adapted to fiscal needs, which is a sign of fiscal dominance.

2.8. Fiscal Dominance

It is true that compared to their fiscal imbalance of the eighties, Morocco and Tunisia, after going for years through restrictive stabilization policies, managed to significantly reduce their fiscal deficit and to keep public debt at an affordable level. In the nineties, the fiscal deficit was brought down to around 3% in both countries. Both countries have also moved to more transparent and more market based debt management instruments as they instituted a system allowing the government to access to financial resources through negotiable and attractive government bonds instead of the previous legal requirements imposed on financial institutions to buy low return government securities. The development of the government debt market was meant to create the right incentive for the government to master its deficit and to enforce fiscal discipline.

Arguably, the new fiscal rules and institutions have contributed to lowering inflation since the early nineties. However, this does not mean that monetary policy is not under fiscal dominance any longer. A closer observation of the links between fiscal and monetary policies indicates rather the opposite.

First of all the availability of privatization funds and of foreign currencies has created the illusion of abundance of resources. The current account has indeed eased, especially in Morocco mainly as a result of high remittances from nationals working abroad, and a rather low rate of investments. The fact is that the structural fiscal deficit has been much higher than the transitory deficit, and fiscal discipline remains a problem. In Morocco, the rate of fiscal deficit excluding privatization revenues has increased after 1995 and has been around 5% during the 2000- 2005 period. Unless this trend is radically changed, and it is going to be socially and politically very hard to do, sooner or later, this fiscal gap will generate excessive pressures on monetary policy.

In Tunisia, the fiscal deficit has recently been lower than in Morocco, but there are more subtle indicators of fiscal dominance. The facts are not fully revealed by the conventional measure of fiscal deficit which hides important contingent liabilities. Coordination between fiscal and monetary policy is normal and desirable in any country as long as one is not dominated by the other. In Tunisia, and may be less so in Morocco, this coordination is systematic but it is such that monetary policy is the follower of fiscal policy; it is set to accommodate the fiscal needs. This operates through several channels, the most important of which is linked to the procedure of government security issuance.

According to the current procedure, every time the Ministry of Finance decides to issue additional government securities (bonds or Treasury bill), first, it informs BCT of the amount and timing of the loan, and, right after and on time for the settlement of the transactions involving the banking system, BCT systematically launches a consecutive competitive tender for an adequate additional money supply. It is important to notice that financial intermediaries authorized to participate in the primary government debt market are owned or under tight control of the banks. The point here is not so much to question this harmonization procedure; indeed, it is desirable to some extent that the central bank does something in this case in order to keep bank reserves at a desirable level and to avoid high volatility within the money market. The point is that the additional money supply has been determined in such a way the key central bank interest rate remains constant and all the rate structure remains unchanged. This being a well rooted behavior, the rate offered to buy the newly issued government securities remains quite stable in the neighborhood of the BCT ongoing rate. Hence, BCT has been accommodating for the government and has determined its money supply according to the fiscal needs and the fiscal deficit level. As mentioned above, this explains partly why the monetary target has been often missed.

The following graph shows how the BCT interest rate (TAO) and consequently the money market rate remain fixed over long periods of time, while the following table shows how all the major rates are rigidly linked to this key BCT rate.

Direct coordination between fiscal policy and monetary policy is not the only mechanism leading to fiscal dominance. In fact, some of the government liabilities, often contingent but sizable liabilities, remain in the form of arrears. The published fiscal deficit being calculated on the cash basis and not on the accrual basis, only completed transactions are accounted for and the arrears do not appear. In some years, these arrears have built up and have forced the central bank to increase money supply in various ways. For instance, between 1996 and 1999, as a result of huge debts accumulated over almost a decade by the government (debts that should have been paid to public enterprises), BCT had to refinance these government engagements over a rather short time. Consequently M2 grew well beyond its target in 1996, 1997 and 1999, despite the attempt of BCT to drain the excess liquidity out of the system and to stabilize the money market rate. Some measures have been taken to deal with this arrear issue and not to leave government transactions out of budget, but the system does not seem immunized against this sort of risk yet.

3. Financial Fragility and the Effectiveness of Inflation Targeting: The Analytical Framework

In general, when assessing the fragility of financial systems, the evolution and impact of NPLs and the default risk of financial institutions are emphasized. We aim in this section at building a fairly simple dynamic macroeconomic model that captures the most important features and characteristics of the Moroccan and Tunisian banking and monetary system. This model will be used to see whether this system can withstand the consequences of adopting IT. More specifically, the model we try to build will be used in order to simulate the impact of the interest rate rise on NPLs dynamics, the demand for central bank liquidity and the dependence of the banking system on the central bank and on inflation. Some of its behavioral equations have been deliberately simplified whenever this simplification induces little cost in terms of the quality of the simulations outcomes.

At this stage of our work, we have been able to simulate this model only with Tunisian data.

3.1. The Model

The first major simplification in this model is with regard to the aggregate supply (y_t) dynamics. Many specifications could be adopted (see Fuhrer 1997); the simplest one is:

$$y_t = y_{nt} + y_t^g \quad (1)$$

Where y_{n} represents the natural output and y_t^g stands for the output gap and/or for a real shock. y_t is the actual output or nominal GDP. This specification does not mean that no trade-off may ever happens between real output (employment) and inflation or that the natural output is constant. We leave open these issues because they hardly matter in the context of this paper. The gap may depend on the difference between the actual and the expected rates of inflation. Our main concern is to understand to what extent IT can operate successfully under the current financial system and assuming various scenarios, including favorable conditions and significant negative exogenous shocks. These shocks could be the result of natural shocks or shocks related to trade or to capital movement. This latter case is expected to become more relevant in the future as the Moroccan and the Tunisian economies liberalize their foreign capital transactions. Hence, one of our main scenarios will be when y is assumed negative and high enough to induce a significant drop in the rate of growth (and increase in the rate of employment

The dynamics of demand and supply of loans constitute important components of this model.

First, the structure of interest rates is assumed to include two main rates: the central bank's rate (i_t) and the commercial banks' rate, the difference being the spread (s_t). This is to say that (i_t) is the central bank main instrument.

The demand for bank loans is assumed to come from firms only and is a function of y_t and $(i_t + s_t) = R_t^L$:

$$L_t^D = L_t^D (y_t, i_t + s_t) \quad (2)$$

Loans demand is supposed to be an increasing function of nominal GDP (y_t) and a decreasing function of the interest rate. Consequently, $\dfrac{\partial L^D}{\partial y} \geq 0$ and $\dfrac{\partial L^D}{\partial i} \leq 0$ This is to say that the interest channel, as regards the monetary transmission mechanisms, does matter and operates in particular through the demand for loans.

The credit channel or the supply side is perhaps operational too but we have not been able so far to provide a solid proof for that. Above all, our interest is to investigate the dynamics generated when banks are willing to satisfy the demand for credits that has

gone through their screening process, knowing that the central bank will support this strategy with more central bank credits when the firms demand for credit increases, and vice-versa. Then, loans supply is determined by loans demand:

$$L^S_t = L^D(y_t, i_t + s_t) \quad (3)$$

We have assumed implicitly, in the above two specifications, that the banking credit market does not attain equilibrium through changes in its interest rate R given i^L_t (BCT has controlled and still indirectly controls credits in Tunisia).

The loans aggregate (denoted by L) granted to firms can be expressed as the sum of non-performing loans (NPL) and good quality loans (PL):

$$L = NPL + PL \quad (4)$$

As stressed at the beginning of this section, our emphasis will be put on the NPLs ratio dynamics as a measure of the performance of the banking sector. Thus, we model the share of nonperforming loans in total loans as a function of macroeconomic contemporaneous and lagged variables such as: economic growth, inflation, interest rates, exchange rate, deposits… A fair simple specification of the NPLs dynamics could thus be expressed as follows:

$$NPL_t = f(y_t, a^g_t) \quad (5)$$

Where a_t stands for the banks profit rate and is another measure of bank performance. The profit rate variable, a_t, is a function of the following variables:

$$a_t = g(R, \pi^{L_{t-i}}_{t-i}, D_{t-i}, NEER_{t-i}, CCB_{t-i}) \quad (6)$$

For sake of simplicity and convenience, we adopt the following specification for NPLs which is nothing but a special case of equation (5)

$$NPL_t = f(y_t, R^{g_{t-i}}_L, \pi_{t-i}, D_{t-i}, NEER_{t-i}, CCB_{t-i}) \quad (7)$$

Equation (7) says how NPLs ratio varies over time. π is the inflation rate, D is deposits, CCB stands for credit obtained by banks from the central bank, and NEER is the nominal effective exchange rate. **We** expect the derivative with respect to the interest rate on loans, $\frac{\partial NPL}{\partial R^L}$, to be positive since an increase of (real) interest rates would be expected to worsen asset quality, making loan repayment more difficult. A priori the partial derivative with respect to inflation may be either positive or negative, since the effect of inflation increase depends on whether its increase was anticipated or not, how flexible are lending rates, and whether the increase signals general economic instability. As for the exchange rate, its effect depends on the composition of outstanding credit (in other words

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the size of unhedged positions and the share of borrowers whose business benefits from a given change in the exchange rate). However, in the case of Morocco and Tunisia we expect it to be negative. Finally, while there is no agreement in the empirical literature on the sign of $\dfrac{\partial NPL}{\partial y^g}$, we expect NPLs to decrease when the output improves; consequently, its sign is expected to be negative. Higher economic growth can be expected to have a positive impact on asset quality in banks (namely in the form of lower nonperforming loan ratios) and to lead to financial development.

Deposits supply, which appears in equation (7), is a function of the output and the interest rate on deposits:

$$D^S = D^S(R^S, y_t^D) \quad (8)$$

With $\dfrac{\partial D}{\partial y} \geq 0$ and $\dfrac{\partial D}{\partial R^L} \geq 0$.

As for the deposits demand, it is supposed to be equal to the households' supply (of deposits). It is worth noting that deposits market cannot reach the equilibrium through interest rate movements seeing that the central bank still control the interest rates structure. R^D is also linked to (i_t) the central bank interest rate.

CCB, the credit from central bank variable is derived from the bank's balance-sheet as follows:[7]

$$CCB = B + (L - NPL) + R - D \quad (9)$$

Though the NEER variable seems to be an important determinant of the NPLs dynamics, the behavioral equation that describes it dynamics has not been added for the sake of simplicity. Nevertheless, this model may be used to simulate the impact of unexpected exogenous depreciation of the national currency. In general, when the currency goes into free fall, banks may be rendered insolvent through a combination of the following channels: the sudden increase in the value (measured in domestic currency) of their foreign liabilities; the default on bank loans by domestic corporation bankrupted by the soaring of their external debts; and the default on bank loans by exporters who could not get short-term credit from their foreign suppliers of inputs. Moroccan banks and more so Tunisian banks are already fragile because of under-capitalization and their high rate of NPLs (Boughrara 2004, IMF 2003 and 2004,). The exchange rate shocks push these banks over. The NPLs problem could bring about a run by depositors causing thereby a banking collapse that would trigger a general output decline.

To describe inflation dynamics, economists have recourse various specifications, often of the Phillips curve type: hybrid, forward-looking (Estrella 2001), backward-looking (Svensson, 2002) specifications. The specification we adopted in this paper is again a simple one:

$$\pi t = \pi(\pi_{t-i}, i_{t-i}, CCB_{t-i}, h_{t-i}) \quad (11)$$

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[7] It is worth noting that B is sufficiently small seeing that Tunisian banks are under-capitalized.

Where $\dfrac{\partial \pi}{\partial i} \leq 0$; $\dfrac{\partial \pi}{\partial CCB} \geq 0$ and $\dfrac{\partial \pi}{\partial h} \geq 0$

The above specification says that inflation might be brought about by fiscal pressure (through the dynamics of high-powered money h_{t-1}), and depend on credits from monetary authorities (CCB variable). More high powered money as assumed to reflect mainly fiscal deficit and fiscal dominance; high-powered money is a proxy for fiscal pressure.

4. Simulations

The macroeconomic model described in the above section is allowed to work through its dynamic path from 1988:Q1 to 2005:Q3 to provide estimates of the endogenous variables known as control or base run. To examine the reaction of inflation and NPLs when an IT policy is adopted we simulate its impact of the economy keeping all the other exogenous conditions unaltered. Having, altered only the exogenous policy variable, under ceteris paribus conditions, the model is again allowed to run through the same temporal path to yield a new set of estimates (policy solution). The difference between the base and policy solution is attributed to the policy under consideration.

The behavioral equations of the model have been estimated by the seemingly unrelated estimator of Zellner with data described in appendix A. As it stands out from specification tests and as shown by the graphics reported below (graphs 5), the equations specification seems to be satisfactory and the structural model fits quite well the data. The simulated variables exhibit dynamics that are quite close to actual series.

In the scenarios designed we assumed that the economy starts from an above the target inflation rate and that the central bank decides an important interest rate increase to combat inflation. The main idea behind this is to assess the soundness of the banking system and the efficiency of IT. Will the target be reached or missed? Would this interest rate destabilize the system and get the inflation rate off its target? In particular, can this system reach its target even when important domestic or external shocks happen along the path? We introduce a real supply side which may be the outcome of unexpected shocks linked to foreign trade or capital flows. Our primary focus in the simulation exercise has been put on the inflation and NPLs dynamics.

The interest rise is defined as an increase of the actual rate by x points in percentage

decided in 2003:1, where $x \in \{0.5, 1, 2, 3\}$. In other words, the exercise supposes that the

short interest rate follows its actual path until 2003:1[8], and then it switches to an upper permanent level as the BCT decided suddenly to move it up vigorously. Formally, the dynamics of the simulated interest rate is as follow:

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[8] The simulation outcomes turned out to be not very sensitive to the timing of the supply shock and that at which the central bank is supposed to raise its instrument

$$R_t^{sim} = \begin{cases} R_t & \text{if} \quad 1988:2 \leq t < 2003:1 \\ R_t + x & \text{if} \quad t \geq 2003:1 \end{cases}$$

The variable stands for the simulated interest rate. In what follows, only the results concerning a rise by 0.5, 1, 2, 3, 4 and 5 points are reported. How will the economy and the financial system react to the interest rate increase, in particular when a negative supply shock occurs? R_t^{sim}

The main simulation outcomes are reported in table 3 for two main scenarios. The

variables followed by the index i are those generated under scenario i where i∈{1, 2}.

The first scenario (i=1) is when BCT decides to increase its interest rate by three points because inflation has gone up from 1.4% to 3.35% in order to bring down to 3% (more or less 0.3%). The second scenario (i=2) starts with a higher rate of inflation and a supply shock. We assumed that the supply shock happens right after the moment BCT decided to increase its interest rate (that is in 2003:Q1). As to the size of the shock it is assumed to equal to three standard deviations of the unanticipated component of the output.

The simulation outcomes show that the rise of the interest rate is relatively effective in bringing down inflation as shown to its target. At the same time, the NPLs slightly slowdown when compared to their historical dynamics. However, under the second scenario, the opposite happens: inflation goes up significantly instead of going down and the NPLs increase immediately. It is worth noting that the inflation increase seems both important and realistic.

Clearly, the simulation output throws doubt on the effectiveness of the IT under the present banking system situation. Because the system is too fragile, the impact of a negative supply shock will limit the effectiveness of IT. A failure of the IT policy may also be obtained if despite the interest rate increase the central bank finds itself under the obligation to create more high powered money as a result of high fiscal deficit that the government could not manage to finance otherwise.

More actions and reforms should therefore be undertaken in order to help the banking system stand on its feet.

The overall conclusions is that a lot remains to be done before committing the country to move to IT in terms of financial and fiscal soundness and discipline and in terms of institutional and governance design symbolized by the independence of the central bank. Fiscal discipline and a deep transformation of the rules of the game within the financial system are in fact a necessity for the success of IT or any other sound monetary policy. These transformations are conceivable in countries like Morocco and Tunisia but not costless in terms of public finance and most of all in terms of institutional and political requirements. The key issue, which is beyond this model, is whether the current policy makers have the incentive and are likely to undertake the necessary moves given their political possibilities and interest? For the moment, the cost of doing so and the uncertainties linked to the transition to IT makes it unlikely to expect such a transition

unless a major shock takes place; which is not excluded as they liberalize further their trade and capital movements. It took Turkey a serious crisis to make the radical decision to switch to IT after years of turbulence and unsound monetary policy; Turkey's ambition of accession to the European Union obviously helped.

References

Association Professionnelle Tunisienne des Banques et des Etablissements Financiers. 2005. "Evolution Des Comptes Du Bilan Durant La Période 1999/2003." http://www.apbt.org.tn/fr/htm/publications/bilans_des_banques.htm

Bank Al Maghreb. *Yearly Report*, Various issues. Rabat, Morocco.

Banque Centrale de Tunisie. 2005. "Surveillance Bancaire." http://www.bct.gov.tn/francais/politique/index.html

Banque Centrale de Tunisie. 2005. "*Loi n° 2001-65 du 10 juillet 2001, relative aux établissements de crédit (1)*." http://www.bct.gov.tn/francais/politique/index.html.

Bernanke, Ben S., Laubach,T., Mishkin, Frediric S. and Adam S. Posen. 1999. "Inflation Targeting: Lessons from the International Experience." Princeton, New Jersey: Princeton University Press.

Debelle, G. and C. H. Lim. 1998. "Preliminary Considerations of an Inflation Targeting Framework for the Philippines." WP#98/39, Washington D.C .

Debelle, Guy and Stanly Fischer. 1994. "How Independent Should a Central Bank Be?" In: Fuhrer, J.C. (Ed.), Goals, Guidelines and Constraints Facing Monetary Policy. Federal Reserve Bank of Boston, Boston.

Estrella, A. 2001. "Securitization and the Efficacy of Monetary Policy." Mimeo.

Faust, Jon and Lars.E.O. Svensson. 2001. "Transparency and Credibility: Monetary Policy with Unobservable Goals." *International Economic Review*, Vol.42:369-397.

Fischer, Stanly. 1994. "Modern Central Banking." In The Future of Central Banking: The Tercentenary Celebration of the Bank of England, (Ed.) Capie et al. pp.262-308.

Grilli, Vittoro, Donato Masciandaro and Guido Tabellini. 1991. "Institutions and Policies." *Economic Policy*, Vol.91:365-392.

IMF. 2006. "Spain: Financial Sector Assessment Program—Technical Note on Stress Testing Methodology and Results." IMF Country Report #06/216. International Monetary Fund, Washington, D.C.

IMF. 2003.IMF Country Report #03/141. International Monetary Fund, Washington, D.C.

IMF. 2003..IMF Country Report #03/163 International Monetary Fund, Washington, D.C.

IMF. 2003.IMF Country Report #03/212 International Monetary Fund, Washington, D.C.

IMF. 2004. IMF Country Report #04/164 International Monetary Fund, Washington, D.C.

IMF. 2005 IMF Country Report #05/418 International Monetary Fund, Washington, D.C.

IMF. 2005..IMF Country Report #05/419 International Monetary Fund, Washington, D.C.

IMF. *Financial Statistics*, Various issues. Rabat, Morocco.

Masson, Paul, Miguel Savastano; and Sunil Sharma.1997. "The Scope for Inflation Targeting in Developing Countries." IMF Staff WP#97/130. International Monetary Fund, Washington, D.C.

Mishkin, Frederic S. 2004. "Can Inflation Targeting Work in Emerging Market Countries?" Paper presented to a conference in honor of Guillermo Calvo, April 2004. IMF, Washington.

Mishkin, Frederic S. 2002. "Does Inflation Targeting Matter? Commentary." *Federal reserve Bank of St Louis Review*, Vol. 84:149-53.

Mishkin, Frederic S. and Miguel Savastano. 2001. "Monetary Policy Strategies for Latin America." *Journal of Development Economics*, Vol.66: 415-444.

Siklos, Pierre L. 2002. "The Changing Face of Central Banking: Evolutionary Trends since World War II." Cambridge University Press, Cambridge

Siklos, Pierre L. and Istvan Ábel. 2002. "Is Hungary Ready for inflation Targeting?" *Economic Systems,* Vol. 26: 309–333.

Svensson, Lars E.O. 2002. "Inflation Targeting: Should It Be Modeled as an Instrument Rule or a Targeting Rule?" *European Economic Review*, Vol. 46:771-780.

Taylor, John B. 2000. "*Using Monetary Policy Rules in Emerging Market Economies."* Stanford University, Stanford
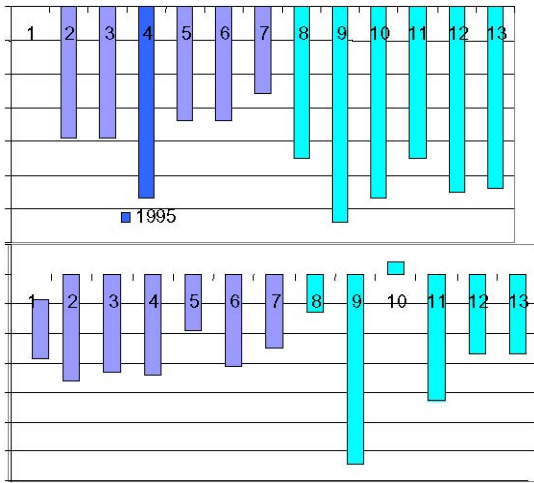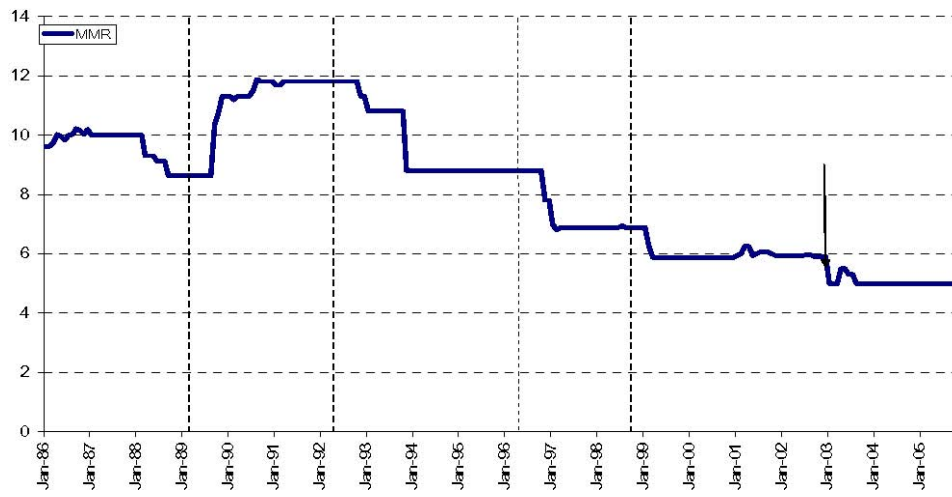
Graph 1: NPLs in Tunisia
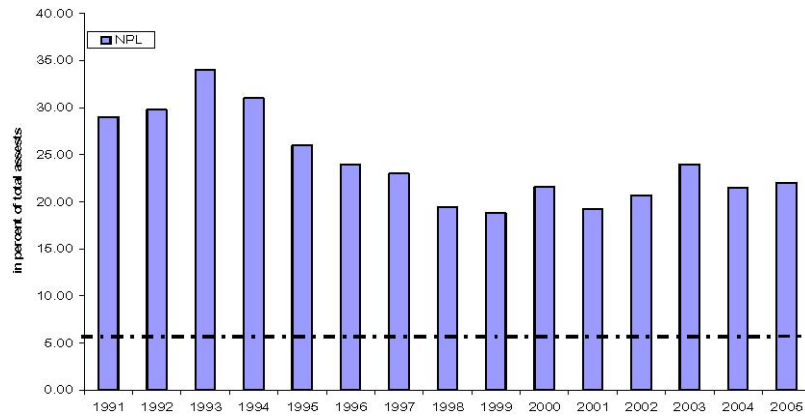
Graph 2: fiscal deficit in Tunisia

FISCAL DEFICIT IN TUNISIA

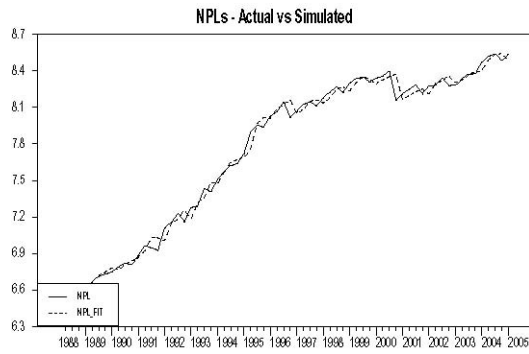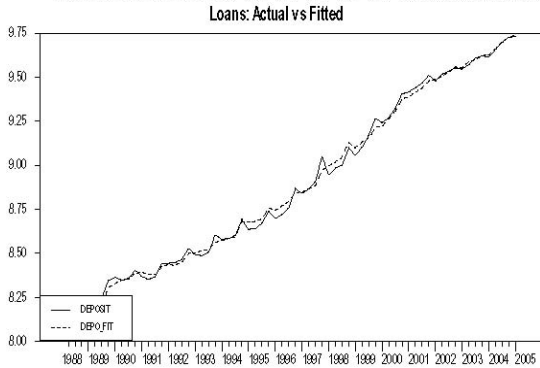1991 - 2005
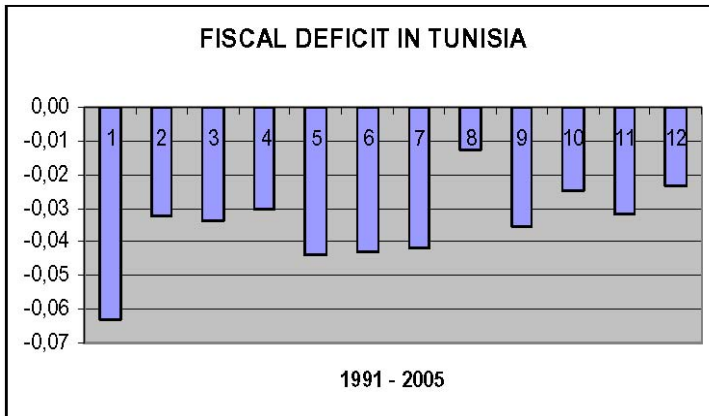
Graph 3a and 3b: Fiscal Deficit in Morocco
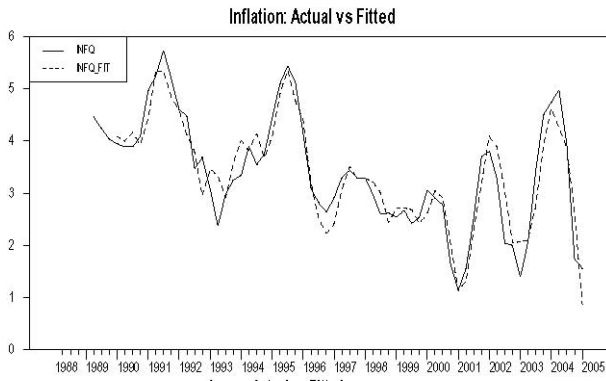
Graph 4: Interest Rates in Tunisia

Source: BCT

Graphs 5: Actual vs. Filtered Variables

Loans: Actual vs Fitted

Inflation: Actual vs Fitted

Loans: Actual vs Fitted

NPLs - Actual vs Simulated

TMD - Actual vs Simulated
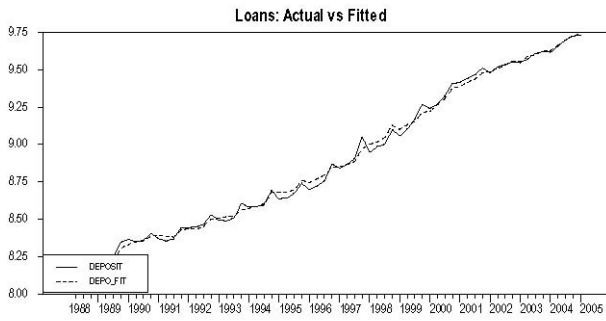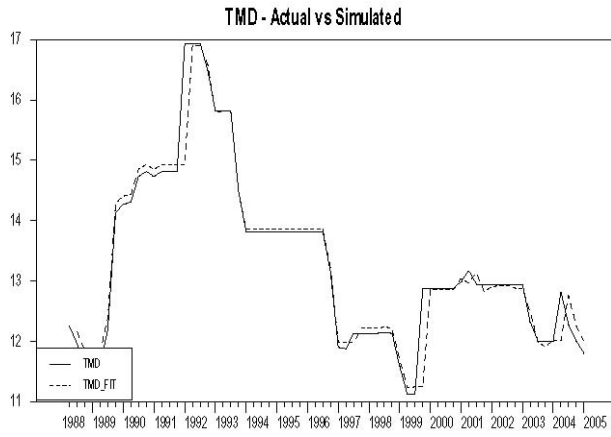
Graphs 6: Inflation under Scenarios 1 and 2

10,000 iterations - Inflation: Actual vs Simulated
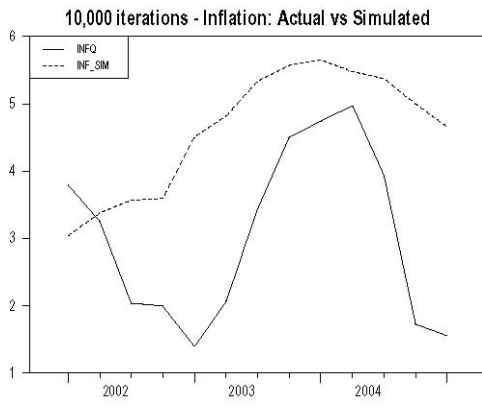
Graphs 7: NPLs under scenarios 1 and 2
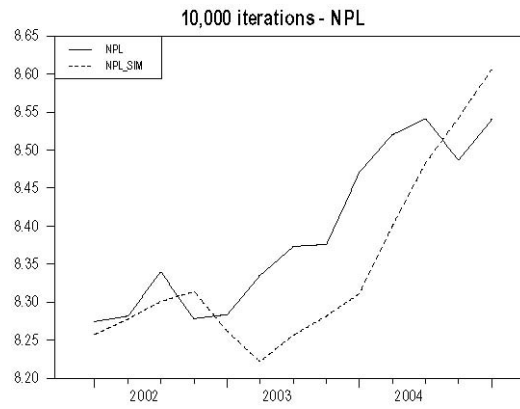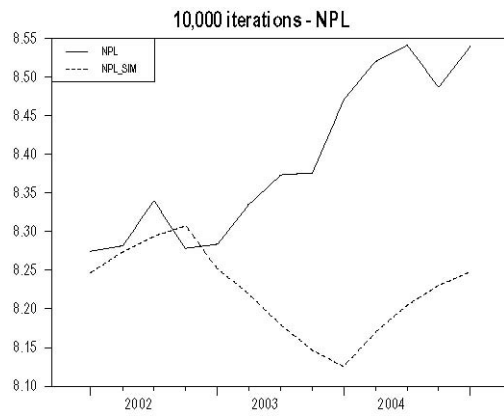
Table 1: Nonperforming Loans in Tunisia (Commercial Banks)

	1993	1996	1999	2000	2001
Gross NPLs	3,503.0	3,601.3	2,949.8	3,082.0	2,949.8
of which state controlled banks	*2,872.2*	*2 518.881*	*2,063.2*	*2,155.7*	*2,063.2*
As a % of gross claims	34.0	25.1	18.8	21.6	19.5
As a % of GDP	23.9	16.7	12.6	15.8	14.3

Source: IMF 2002, and own calculation.

Table 2: Interest Rates in Tunisia

Interest rate	%
BCT call for tender rate (TAO)	5.00
1 to 7 days repo rate	6.00
3 month loans to banks secured by government bonds (31 August 2004)	5.08
Money market rate (TM)	4.98
Average money market rate (TMM) (May 2006)	5.00

Source: BCT   www.bct.gov.tn

Table3: The Dynamics of Inflation and NPLs under the Two Scenarios.

	inflation			NPLs		
Scenario	Base run	scenrio_1	Scenario_2	Base run	scenrio_1	Scenario_2
2003-Q1	1.4	3.35	4.48	8.28	8.27	8.28
2003-Q2	2.07	2.76	4.81	8.34	8.23	8.24
2003-Q3	3.43	2.46	5.34	8.37	8.2	8.28
2003-Q4	4.5	2.36	5.56	8.38	8.16	8.3
2004-Q1	4.74	2.56	5.63	8.47	8.14	8.32
2004-Q2	4.97	2.81	5.45	8.52	8.17	8.41
2004-Q3	3.93	3.17	5.36	8.54	8.21	8.5
2004-Q4	1.73	3.15	5.01	8.49	8.22	8.56
2005-Q1	1.56	2.96	4.66	8.54	8.24	8.62

Appendix A: Data Description and Sources

Variable	Source
Consumer price index	IMF, IFS CD-ROM, line 64.
Nominal effective exchange	IMF CD-ROM
Bank loans to households a	IMF, IFS CD-ROM, line 32D
Real bank loans	Computed as L/P (Line 32D over line 64)
Short-run (nominal) interest	Central bank of Tunisia
Interest rates on Deposits	Central bank of Tunisia
Interest rate on Loans	Proxied by the Taux maximum de découvert banca
Bank deposits	IMF, IFS CD-ROM, line 24 + line 25.
Nominal GDP	IMF, IFS CD-ROM, and interpolated using Chow-
Non performing loans	Proxied by frozen loans (Central bank of Tunisia)
Capital adequacy ratio	Computed as CR= bank capital/total assets
Inflation rate	computed as p_t-p_{t-4}, where $p = \log(P)$
Real effective exchange rate	IFM CD-ROM
Credit from Monetary autho	IMF, IFS CD-ROM.
Reserves	Central Bank of Tunisia.

Note: All the variables are available on quarterly frequency except the nominal GDP which is available on an annual frequency. The Chow-Lin procedure has been used to generate a quarterly figure.