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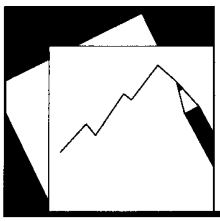

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Fiscal Determinants of Inflation: A Primer for the Middle East and North Africa

Domenico Fanizza and Ludvig Söderling

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Fiscal Determinants of Inflation: A Primer for the Middle East and North Africa

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Abstract

Many countries in the Middle East and North Africa (MENA) region have recently experienced surges in money growth that apparently have not generated significant inflationary pressures. Moreover, several MENA countries have followed monetary policy rules that according to standard monetary theory should have produced macroeconomic instability and possibly hyperinflation. We argue that the Fiscal Theory of the Price Level could usefully provide insights on these developments. Our main conclusion is that a sound fiscal position constitutes a necessary condition for macroeconomic stability whereas "sound" monetary policy is neither sufficient nor necessary. Hence, fiscal policy and public debt deserve particular attention for maintaining macroeconomic stability, by and large consistent with Fund policy advice to MENA countries.

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I. INTRODUCTION

Many countries in the Middle East and North Africa (MENA) region have recently experienced surges in money growth that apparently have not generated significant inflationary pressures. Since the late 1990s, unsterilized balance of payments inflows from oil exports, privatization, or workers' remittances have coincided with falling income velocity of money, leaving inflation relatively subdued. Moreover, several MENA countries have followed monetary policy rules that according to standard monetary theory should have produced macroeconomic instability and possibly hyperinflation. In fact, by and large, with a few notable exceptions, the region has experienced an unprecedented period of sustained macroeconomic stability during the last 7–8 years.

While *ad hoc* explanations abound for the particular experiences of each country, the purpose of this paper is to provide a unified analytical framework that could help understand not only the subdued inflation in most countries, but also the notable exceptions, i.e., the few cases of moderate inflation or breakdown in exchange rate pegs. We argue that the Fiscal Theory of the Price Level (FTPL) could usefully provide insights on these developments with implications, by and large, consistent with Fund policy advice to MENA countries.

The FTPL has attracted renewed attention because of the significantly larger share of government revenue from bond inflation than from seigniorage during the currency crises of the late 1990s.[2] Moreover, recent contributions to the literature have shown that standard monetary models produce indeterminacy of prices under a wide set of monetary policies, and that in these cases the government budget constraint can work as an equilibrium selection rule.[3] In this paper we argue that many MENA countries follow monetary policies that make a country's fiscal position a key determinant for inflation. The FTPL predicts that eliminating seigniorage revenue is not sufficient to prevent moderate to high inflation. In fact, prices need to increase to offset the loss of seigniorage revenue if money creation is constrained. This is consistent with the observed experience in transition economies in the early 1990s, where inflation dropped only with a significant delay after monetary reform. We believe that the FTPL not only constitutes an interesting theoretical contribution, but it also provides useful implications for policy advice to MENA countries. The purpose of this paper is to explore these policy implications.

Our main conclusion is that countries' fiscal policy and public debt deserve particular attention for maintaining macroeconomic stability. In particular, a sound fiscal position constitutes a necessary condition for macroeconomic stability whereas "sound" monetary policies constitute neither a sufficient nor a necessary condition. In addition to providing a model-based rationale for the strong emphasis Fund policy advice has placed on fiscal policy in many countries, the proposed analytical framework allows us to draw two major

[2] Burnside, Eichenbaum, and Rebelo (2001).

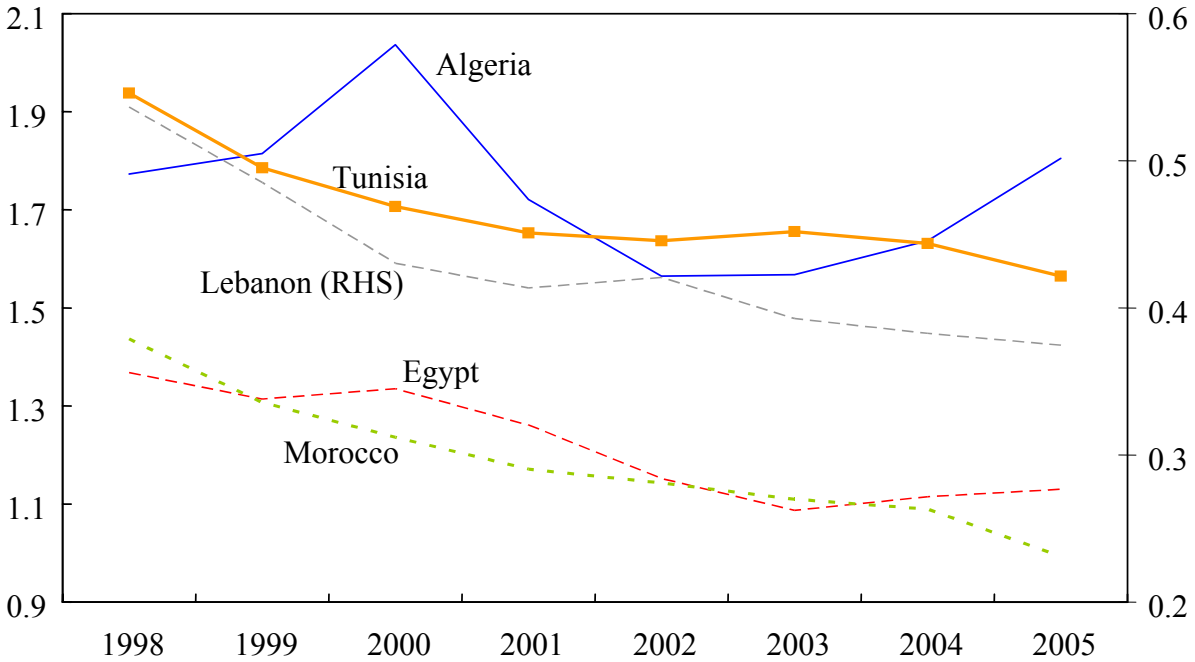
[3] Christiano and Fitzgerald (2000).

implications for the Fund's policy advice. First, policy discussion on monetary policy should generally focus on reserve money, rather than broader monetary aggregates because only reserve money enters the government budget constraint. Second, efforts to build a favorable institutional setting for monetary policy are bound to fail unless country authorities ensure a solid fiscal position.

II. Money and Prices in the Middle East and North Africa: The Puzzle of the Missing Inflation

The link between money and prices appears weak at best, if one looks at the experience in MENA countries. The income velocity of money been unstable in almost all countries in the region during the past decade, in many cases reflecting low inflation despite rapid money growth (Figure 1 and Table 1). The literature has often attributed this instability in money velocity to structural changes and financial innovations. However, the magnitudes of such swings in conjunction with the limited pace of financial innovation in the region leads us to believe that other factors are also relevant.[4] Moreover, improved confidence in macroeconomic policies can only account for part of the changes in velocity, since macroeconomic stabilization had by and large been accomplished by the mid-1990s in several MENA countries. Thus, we believe the puzzle of the missing inflation in the region calls for an explanation.

Figure 1. Velocity in selected MENA countries, 1998-2005



Source: IMF, Regional Economic Outlook database.

[4] See Creane and others (2004) for summary descriptions of financial developments in the region.

Many MENA countries have, or had until recently, fixed or heavily managed exchange rates. Nevertheless, *de jure* or *de facto* restrictions on capital flows have generally provided them with a significant scope for monetary discretion. Hence, a discussion on monetary conditions remains valid.

Table 1. Broad Money growth and inflation, average annual percentage change 1998-2005

	Broad Money growth	Inflation
Algeria	18.8	2.7
Egypt	12.5	5.1
Excluding revaluation effects	11.1	5.1
Lebanon	10.5	1.3
Morocco	9.4	1.6
Tunisia	10.2	2.7

Sources: IMF, Regional Economic Outlook database and IMF staff estimates.

We will focus our analysis on five MENA countries: Algeria, Egypt, Lebanon, Morocco, and Tunisia. Large workers' remittances and only partially sterilized privatization inflows led to rapid monetary growth during the period 1999–2005 in Morocco, while inflation remained below 2 percent on average and there was no noticeable pressure on the exchange rate peg. Protracted excess liquidity conditions in the banking system did not translate into demand pressures and, contrary to widespread expectations, inflation remained subdued. Similarly, massive unsterilized inflows from oil exports have not caused a surge in inflation in Algeria or several other oil producing countries. Tunisia followed a fixed real effective exchange rate (REER) policy with a monetary policy that defacto targeted the nominal interest rate for more than a decade, yet the absence of a nominal anchor did not induce high or volatile inflation.[5] On the other hand, despite relatively moderate money growth, Egypt did not succeed in curbing price pressures, which led to a significant real exchange rate appreciation and eventually a breakdown in its fixed exchange rate regime.[6] This paper takes the stance that the absence of high inflation in Algeria, Morocco, and Tunisia is to a large extent explained by their fiscal positions, which have been characterized by a declining public debt. Conversely, we argue that the unaddressed fiscal issues are a key reason why Egypt's exchange rate peg did not hold. The case of Lebanon is also interesting, since it highlights the importance of the currency composition of public debt. Despite gravity-defying public debt levels, inflation is subdued and the exchange rate peg remains intact. We will suggest that

[5] The consequences of REER targeting are well documented in the literature (see Adams and Gros, 1986). The REER targeting experience in Tunisia has been discussed by Fanizza and others (2002).

[6] For a discussion on monetary policy reform in Egypt, see Söderling (2003).

this is because Lebanon's debt is largely denominated in foreign currency and therefore cannot be reduced easily through domestic inflation.

III. An Alternative Analytical Framework: The Fiscal Theory of Prices

In this section, we propose a unified analytical framework that could help organize, in a systematic manner, the analysis of the role of fiscal policy as a key factor in macroeconomic stabilization.

A. The Underlying Model: Standard Cash-in-Advance

The model underlying the analysis is a "plain vanilla" cash-in-advance model. Since the purpose of the model is to illustrate a few broad points, we keep the model as simple as possible. Moreover, we prefer a standard model to emphasize that our conclusions are not dependent on sweeping changes to mainstream monetary theories, or on any number of fancy bells and whistles in the model. In this respect, we have no pretence of making groundbreaking advances to economic theory; rather, our contribution is to propose an application of an existing framework to the MENA region. Although we will model a closed economy, the main points can easily be translated into an open economy context.[7] We assume perfect foresight, again for simplicity.

On the production side, there is no capital, nor any labor. Firms simply purchase GDP = y from households and transforms this into two goods, c_1 and c_2. Given the absence of any productivity progress, y is constant. The production function is simply:

$$y_t = \bar{y} = c_{1,t} + c_{2,t}. \qquad (1)$$

Given this specification of the production function, the marginal rate of transformation is unity (i.e., the real marginal cost of production is the same for the two products), which in turn implies that prices of goods 1 and 2 will be equal in equilibrium. Hence, we will refer to one price only, P_t.

$c_{1,t}$ is a 'cash' good and $c_{2,t}$ is a 'credit' good. Households need to set aside cash in advance to purchase the cash good. Specifically, each period is divided into two parts. In the first part of the period, households participate in the bond market and decide how much government bonds to purchase and how much to hold in cash. The trade-off between cash and bonds is that bonds earn interest, while cash is necessary to acquire the cash good. In other words:

$$P_t c_{1,t} \leq M_t^d \qquad (2)$$

Where M_t^d is demand for cash balances. Bonds are discounted government bonds: they cost $B_{t+1}/(1+R_t)$ at time t and return B_{t+1} the next period, where R_t is the nominal interest rate at time t.

[7] See Daniels (2001) for a open-economy version of the basic FTPL model.

In the second part of the period households participate in the goods market, i.e., purchase c_1 and c_2. Payments for both goods take place at the beginning of next period.

Households

The infinitely lived, representative household maximizes lifetime utility given by

$$\sum_{t=0}^{\infty} \beta^t \log[(1-\sigma)c_{1,t}^{\upsilon} + \sigma c_{2,t}^{\upsilon}]^{\frac{1}{\upsilon}} \tag{3}$$

where β is the discount factor. While the firms receive the same price for either good, the consumers' opportunity cost for good 1 (the cash good) is higher, since they have to forgo interest earnings on any cash holdings. Hence, the households' perceived cost of good 1 is equal to $P_t(1+R_t)$. It follows that the marginal rate of substitution between the two goods will be $1+R_t$. Explicitly,

$$\frac{\partial U / \partial c_{1,t}}{\partial U / \partial c_{2,t}} \equiv \frac{u_{1,t}}{u_{2,t}} = \frac{1-\sigma}{\sigma}\left(\frac{c_{2,t}}{c_{1,t}}\right)^{1-\upsilon} = 1 + R_t \tag{4}$$

Intertemporal optimization also requires that the following Euler condition be satisfied:

$$\frac{u_{2,t}}{P_t} = \beta \frac{u_{1,t+1}}{P_{t+1}} \tag{5}$$

The intuition for equation (5) is straightforward: the household could reduce its consumption of the credit good by a marginal dollar in period t and set it aside for consumption of one additional dollar of the cash good in period t+1. The household would hence give up $u_{2,t}/P_t$ of utility to get $u_{1,t+1}/P_{t+1}$ of utility one period later. If the household optimizes, the latter discounted back one period needs to equal the former.

Optimization also requires that a transversality condition be fulfilled. This condition states that the present value of assets (bonds and money balances) should tend to zero in the infinite future. If this were not the case, households could increase their utility by accumulating fewer assets and consuming more.

The Government

To avoid unnecessary complications in the firms' resource constraint, which is not of primary importance in the present analysis, it is convenient to assume that the government does not buy any goods. It does, however, raise taxes and participate in the bond market. One could think of this as the government having inherited a stock of debt at time 0 and needing to service this debt in the future by raising taxes and seigniorage revenues.

The government's flow budget constraint is:

$$\frac{b_t^* P_{t+1}^*}{1+R_t} + \frac{B_{t+1}}{1+R_t} + T_t + M_t^s - M_{t-1}^s = B_t + b_t^* P_t^* \qquad (6)$$

where b^* denotes real (indexed) debt (all debt measured at the end of bond trading), B is nominal debt, and M^s is base money supply held by households. The real debt is indexed on inflation, and can therefore, unlike the nominal debt, not be deflated away. Normalizing $P_0^* = P_0$ implies that $P_t^* = P_t$ for all t. Real debt can also be thought of as foreign-currency-denominated debt. Assuming that purchasing power parity holds, this debt would behave exactly as inflation indexed debt.

Denoting nominal government liabilities at time t as $D_t = b_t^* P_t + B_t + M_{t-1}^s$, the government's budget constraint can be written as:

$$\frac{D_{t+1}}{1+R_t} + \frac{R_t}{1+R_t} M_t^s + T_t = D_t \qquad (7)$$

where $\frac{R_t}{1+R_t} M_t$ is revenue from seigniorage, equal to the government's interest savings from issuing money rather than debt. After dividing both sides by P_t, while noting that $1 + R_t = (1 + r_t)\left(\frac{P_{t+1}}{P_t}\right)$, and recursively substituting forward, the government's inter-temporal budget constraint in real terms becomes.

$$d_t \equiv b_t^* + \frac{B_t + M_{t-1}}{P_t} = \sum_{j=0}^{\infty} \delta_{t,t+j} (\tau_{t+j} + \frac{R_{t+j}}{1+R_{t+j}} m_{t+j}) + \frac{\lim}{T \to \infty} \delta_{t,t+T} d_T \qquad (8)$$

Where lower case letters indicate real term measures and $\delta_{t,t+i} \equiv \prod_{j=1}^{i} \frac{1}{1+r_{t+j}}$ is the discount factor with $\delta_{t,t} = 1$. Note that government liabilities are simply the households' assets. Hence, the transversality condition implies that the last term of the budget constraint must be zero in equilibrium. The government's budget constraint thus states that the current real level of debt must be equal to the present value of current and future real income from taxes and seigniorage.

Equilibrium

Equilibrium requires that goods and asset markets clear, the government's budget constraint is fulfilled, the households' Euler conditions and the transversality condition are satisfied and that their constraint on money holdings holds with equality. The latter implies:

$$P_t c_{1,t} = M_t \Rightarrow m_t = c_{1,t} \tag{9}$$

The latter, combined with the Euler equation (4) permits formulating the money demand function as

$$m_t = \frac{\bar{y}}{1 + [\frac{\sigma}{1+\sigma}(1+R_t)]^{\frac{1}{1-\upsilon}}} = f(R_t) \tag{10}$$

B. Multiple Equilibria

We will now show that this standard model leaves the price level undetermined and may even lead to hyperinflation under certain monetary policy rules widely applied in the Middle East and North Africa region. The objective is to show that an additional equilibrium condition may need to be considered in order to close the model under these monetary policy rules. In this regard, we will focus on the government's intertemporal budget constraint, within the context of the fiscal theory of the price level.

Two examples: fixed nominal interest rate and constant money supply

Monetary policy in several countries in the MENA region can most appropriately be described as liquidity management. The central bank ascertains that the banking sector has enough liquidity for its operations in order to avoid undue volatility in interest rates, which in some cases could have adverse effects on the corporate sector's balance sheets and hence on banks' loan portfolios. As an illustration of the potential effects of liquidity management, we will examine a case where the central bank sets a constant nominal interest rate. We shall see that within the context of the standard model, the price level is then undetermined.

Another example of monetary policy in the region is some kind of money targeting. Indeed, monetary targets in the sample countries are often established through a simple Fisher identity with a stable (or even constant) velocity. If we assume that both income velocity of money and the money multiplier are constant, a broad money targeting framework would be equivalent to a constant money stock in our model (noting the absence of GDP growth in the model).

Beginning with the example of a fixed nominal interest rate, we note that the price level appears in two equations in the model, namely the money demand function and in the government's intertemporal budget constraint.

With a fixed nominal interest rate, real money demand is given as

$$\frac{M_t}{P_t} = f(\bar{R}) \tag{11}$$

Note that the money demand equation only pins down the demand for *real* money balances, but not the price level separately. With a fixed nominal interest rate and fixed real money

balances, real seigniorage revenues are also fixed at some level $\bar{s}$. Hence, we can express the government's intertemporal budget constraint as

$$b_t^* + \frac{B_t + M_{t-1}}{P_t} = \sum_{j=0}^{\infty} \delta_{t,t+j}(\tau_{t+j} + \bar{s}) \tag{12}$$

Whether these two equations are sufficient to pin down the price level or not depends on how fiscal policy is made. If, as in the traditional (so-called Ricardian) view, the budget constraint really works as a restriction for fiscal policies so as to guarantee that the constraint is always respected, regardless of the level of debt, the two equations are not sufficient to pin down the price level. Indeed, under the Ricardian view, fiscal policy is completely endogenous, and the two equations cannot pin down three endogenous variables (money, prices, and fiscal policy). The non-Ricardian view underlying the fiscal theory of the price level instead considers fiscal policy as exogenous, reflecting the unwillingness or inability of the fiscal authorities to respect budget constraints or respond forcefully, if needed, to their prevailing debt situation. For instance, assuming a constant fiscal surplus as a share of GDP (i.e., $\tau_t = \bar{\tau}$, given the absence of GDP growth), the government's intertemporal budget constraint would pin down the price level. In this case, the constraint would no longer be an absolute restriction, but rather a condition that would be guaranteed to hold in equilibrium only.

Let us now turn to the second example – a fixed money stock. Note that the real interest rate is constant in the steady state. Hence, since output is assumed constant, money demand becomes a function of inflation that can be expressed as

$$\frac{M_t}{P_t} = f(\frac{P_{t+1}}{P_t}), f' < 0 \tag{13}$$

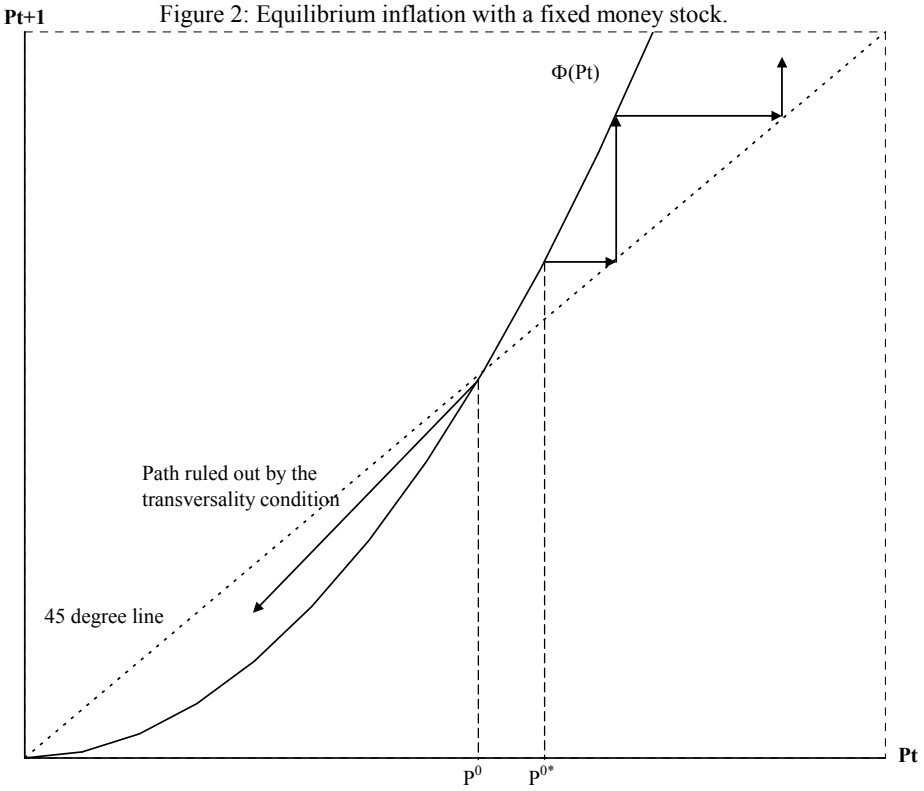
Define $g(\bullet) = f^{-1}(\bullet)$. In other words, $g(\bullet)$ is the inverse of $f(\bullet)$, i.e., the function that finds the rate of inflation for a given level of real money demand.

$$P_{t+1} = P_t g(\frac{\overline{M}}{P_t}) = \Phi(P_t) \tag{14}$$

One solution to the difference equation (14) is $P_t = P^o$, i.e., zero inflation. There are, however, other, less benign, possible equilibrium paths, as illustrated in Figure 2. Given the convexity of the money demand function, Φ(P) is also convex. Moreover, it is upward sloping: since $f' < 0, g' < 0$, as well, which implies that $\Phi' > 0$. Finally, $\Phi'(P^0) > 1$, which is shown by the following

$\Phi'(P^0) = g\left(\frac{\overline{M}}{P^0}\right) - \frac{\overline{M}}{P^0} g'\left(\frac{\overline{M}}{P^0}\right)$. However, at $P_t=P^0$ the price level is constant, which implies that $g\left(\frac{\overline{M}}{P^0}\right)=1$. And, since $g'<0$, it follows that $\Phi'(P^0)>1$. Hence, $\Phi(P)$ cuts the 45 degree line from below at $P=P^0$ as shown in Figure 2.

Figure 2: Equilibrium inflation with a fixed money stock.



The shape of $\Phi(P)$ implies that any initial price level higher than P^0 results in hyperinflation unless there is another way to pin down the price level. Note that such paths respect the money demand condition (10) and the transversality condition, and are therefore all valid equilibria. Initial price levels lower than P^0 are ruled out because they would violate the transversality condition, since real money balances would go to infinity as the price level dropped toward zero.

Again, in this case the price level can be pinned down by fiscal policy. Consider, for example, a fiscal policy rule where any changes in real seignorage revenues are fully offset by an opposite change in real tax revenues, i.e., $\tau_t + s_t$ is constant. This uniquely pins down the price level through the government's budget constraint as before, while the nominal interest rate is determined by the money demand function. In this context, seigniorage remains endogenous and a fiscal rule aimed at offsetting any changes in real seigniorage revenues may appear somewhat contrived. However, as mentioned earlier, seignorage revenues tend to be small relative to other sources of revenues and therefore, a high degree of fiscal rigidities may approximate a fully exogenous, non-Ricardian, fiscal process.

Ricardian or non-Ricardian policies: The Case of the Middle East and North Africa

It is not unreasonable to argue that many if not most of the countries in the Middle East and North Africa are dominated by fiscal, rather than monetary concerns. This could be the case because political considerations limit the scope for fiscal consolidation, or because of inefficient tax and expenditure policies, weak fiscal institutions, or due to other uncontrollable factors having an impact on fiscal performance, such as security concerns, commodity price trends, trade-related issues, etc. In such non-Ricardian (fiscally dominant) economies, it is the essentially exogenous discounted future primary balances (the right-hand side of the government's budget constraint) that determine the real level of debt rather than the other way around. If the fiscal outlook is such that economic agents no longer have confidence in the government's ability or willingness to generate primary surpluses sufficient to repay outstanding debt, even a relatively tight monetary stance may not be sufficient to guarantee price stability. The reverse argument can also be made: a reasonably sound fiscal position could salvage macroeconomic stability, even when a true nominal anchor is missing or the monetary stance is loose.

IV. THE FISCAL THEORY OF THE PRICE LEVEL APPLIED TO MENA

Without denying the relevance of idiosyncratic factors in individual countries, we believe that the FTPL can contribute to explaining the inflation outcome in the MENA region over the past decade. Although we have used a closed economy model, the main points are transferable to an open economy environment. In particular, if the exchange rate is fixed, a weak fiscal position may not cause significant overall inflation, since the price of tradables are pinned down through the exchange rate. Rather, the impact is seen in the relative price of tradables to non-tradables, eventually forcing an exit from the peg.

Among the sample countries, Morocco's privatization receipts have helped finance significant fiscal deficits for a good part of the past decade and contributed to put public debt on a steeply declining trend.[8] In terms of the simple model presented in this paper, this may have been enough to ensure that the budget constraint remain respected even in the absence of a correction of the price level. However, this also highlights the risks of Morocco's current fiscal policies. Absence of stepped-up fiscal reforms may have consequences not only for public debt but for inflation as well.

Algeria has run substantial fiscal surpluses since 2000, halving the public debt-to-GDP ratio to about 35 percent in 2005, a puny number compared to its hydrocarbon wealth. We would argue that this strong fiscal position has contributed to subdue price pressures from money growth.

In the case of Tunisia's REER targeting framework, lacking a nominal anchor in the traditional sense, prices have in practice been anchored by prudent fiscal policies. Public debt

[8] Morocco's government debt fell from about 81½ of GDP in 1999 to 66 percent in 2004. It increased to about 70 percent in 2005 due to one-off factors.

has been relatively stable at around 60 percent of GDP for the past decade and is now on a declining trend, with a favorable medium-term outlook.

Egypt maintained a *de facto* exchange rate peg against the U.S. dollar throughout most of the 1990s. During this period, the REER appreciated by some 80 percent, most of which was due to the inflation differential vis-à-vis its trading partners. A series of devaluations of the currency after 2000 corrected part of this real appreciation but ultimately failed to support the peg, which was effectively abandoned in 2004. Meanwhile, broad money (adjusted for valuation effects) grew only by about 10 percent annually on average in the five years preceding the breakdown of the peg. By contrast, the fiscal position weakened substantially, most clearly seen in the net public debt, which increased by nearly 20 percentage points of GDP. We would make the case that this is a key reason why the peg could not hold.

If the fiscal position is an important determinant for macroeconomic stability, one may wonder why inflation is low and the peg apparently holds up well in Lebanon, where the public debt-to-GDP ratio has reached some 175 percent of GDP. The key here is that Lebanon's public debt is largely denominated in foreign currency. The FTPL does not predict real debt (i.e., indexed or foreign-currency-denominated debt) to influence macroeconomic stability for the simple reason that a price adjustment would do nothing to alleviate the government's budget constraint.

As a final sidebar, it is interesting to note that the FTPL does not apply to asset prices. Hence, the inflationary impact of abundant liquidity in many MENA countries, especially oil-producing ones, has been more noticeable in the stock markets than in the consumer price index.

V. Implications for Fund Policy Advice

In the context of IMF policy advice, fiscal policy is generally considered secondary for containing inflation and fiscal analysis is usually focused on debt sustainability issues. However, as we have seen, monetary policy may be insufficient to explain price developments. More specifically, the examples above indicate that strong money growth does not necessarily lead to inflation if public debt is manageable. Conversely, one might infer that prudent monetary policies are not enough to guarantee price stability, if not supported by a reasonably strong fiscal position. Note that this proposition differs from the usual assertion that absence of fiscal dominance is a prerequisite for effective monetary policy. The model presented here concerns the *stocks* of public debt and money. This is quite distinct from the usual fiscal dominance argument, which refers to the difficulty of central banks to control money *growth* in the presence of significant government financing needs. Without denying the importance of monetary policy, the above analysis suggests that fiscal policy and public debt dynamics merit a particularly prominent place in the Fund's policy advice, including in the context of ensuring price stability.

In addition, our model can be useful in understanding why certain unorthodox monetary and exchange rate policies may not result in the disasters otherwise predicted. For instance, while monetary policies aimed simply at maintaining adequate liquidity in the banking system leave money growth undetermined, such policies may not threaten price stability as long as

they are underpinned by a reasonably strong fiscal and public debt position. The same can be said about REER targeting.

Finally, our analysis suggests that monetary programming should generally focus on reserve money rather than broad money, since only the former enters the government's budget constraint.

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