Inflation Targeting as a Monetary Policy Framework: Issues and Concerns

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January 24, 2008

 “… no country has yet abandoned inflation targeting.”
Batini, Kuttner and Laxton (2005, p. 179)

1. Introduction

By a monetary policy framework I mean:

- a set of macroeconomic objectives for monetary policy, including but not necessarily limited to price stability.
- a set of instruments the central bank uses to achieve these objectives.
- a procedure for guiding the choice of instruments as functions of observable variables and expert judgments, often involving intermediate targets.
- a strategy for communicating central bank choices to the public.

Since the late 1990s, a substantial proportion of emerging-market countries have adopted inflation targeting (IT) as a monetary policy framework. The hallmarks of this approach are an explicit commitment by the central bank to keep an inflation index close to a periodically-adjusted target, and the use of an inflation forecast as the intermediate target for policy. IT regimes stress a high degree of transparency, supported by regular public statements that interpret inflation outcomes and explain monetary policy actions in terms of the inflation objective.

The initial experience of adopters has been highly encouraging. A careful recent empirical study finds that the 13 emerging-market countries that adopted IT between 1997 and 2002 experienced lower and more stable inflation subsequent to adoption – and larger improvements on both measures – than did a control group of non-targeting emerging-market countries including Nigeria, and at no detectable cost in terms of real volatility (Batini et al., 2005). Moreover, none of the adopters satisfied the full set of preconditions featured in the inflation-targeting literature. The success of inflation targeting, moreover, appeared to be largely unrelated to indicators of exchange rate regime, financial sector robustness, and even fiscal stability (Batini, et al. 2005).

These observations provide a powerful impetus for considering a move to inflation targeting in Nigeria. In this paper I focus on three questions. First, what are the important differences between an inflation targeting framework and the framework in use at the

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CBN? The answer to this question is evolving sharply in Nigeria, as I argue in Section 2. Before about 2000, the answer would have been simple: an inflation targeting framework targets inflation, while the CBN framework does not. Since then, however, Nigerian policymakers have placed a high weight on fiscal discipline, and institutional advances have been made in protecting CBN from fiscal dominance. If these gains can be consolidated, the differences between frameworks become narrower: at bottom, the CBN uses a monetary aggregate as its intermediate target, whereas an inflation targeting framework uses the (forecasted) inflation rate. For a given long-run inflation rate, this difference has implications for how monetary policy responds to shocks in the short to medium run, and therefore for macroeconomic outcomes. It may have further implications as well; for example, transparency and accountability are probably easier to achieve when the intermediate target is one of the ultimate objectives of monetary policy than when it is not. But other differences between the current CBN framework and inflation targeting are probably less fundamental, at least in practical terms. For example, while most inflation-targeting central banks use a short-term interest rate as their instrument, inflation targeting can also be implemented using the reserve money instrument currently employed by the CBN. The choice of instrument will affect how an inflation targeting framework responds to shocks, but the same is true for a framework that uses a monetary aggregate or some other intermediate target. This feature therefore does not fundamentally differentiate inflation targeting from the CBN’s current framework.

Second, what are the advantages for Nigeria of moving to inflation targeting, and are there important drawbacks relative to the current system? Since the battle for fiscal discipline is not yet won, this question should probably be asked at two levels. First, how would committing to a tight range for inflation affect the economy’s exposure to fiscal mismanagement? Second (and more at the heart of the inflation targeting literature), how would this approach affect the economy’s response to other macroeconomic shocks? I address these questions briefly in Section 3.

Finally, in implementing inflation targeting in Nigeria, how should the inflation target be balanced against other objectives of monetary policy, including particularly exchange rate stability? This question also bedevils the current system, where it surfaces regularly in IMF documents that encourage the CBN to state ever more clearly its allegiance to a monetary anchor and its commitment to a market-determined exchange rate. This attitude of the Fund’s is understandable. Nigeria’s long experience rules out attempting to reconcile conflicting policy targets through porous and distortionary capital controls. Given this, the ‘impossible trinity’ probably rules out not just a hard peg but any managed exchange rate regime in which the exchange rate takes dominant priority as a nominal anchor. But as I argue in section 4, this does not logically push the CBN to a float, either in the current system or as a complement to inflation targeting. In practice, inflation targeters display a wide range of attention to the exchange rate, in some cases going as far as an announced rate of crawl plus a band (e.g., in Chile and Israel). Among emerging-market targeters, Edwards (2007) finds that the real exchange rate often plays an empirically significant role in estimated reaction functions. It is not clear, therefore, that inflation targeting raises major new issues in terms of exchange rate management,
relative to the current system. The fiscal management of oil revenues, for example, affects the intertemporal path of the equilibrium real exchange rate in both systems; the more stabilizing this management is, the greater scope there is for reconciling active exchange rate management with credible attachment to the ultimate anchor.

In a concluding section I ask whether Nigeria’s situation favors adoption of inflation targeting or a focus on continued institutional improvements within the current system, perhaps with a view to putting preconditions in place. On balance I do not think much is gained by delay.

2. Inflation in alternative monetary policy frameworks

Price stability has been an explicit objective of the CBN since its inception. This is no surprise, because the *raison d’être* of any central bank is the monopoly it holds on the domestic currency issue. With this comes an interest in maintaining a stable purchasing power of the currency in terms of goods and services.

In fact, however, inflation was high and volatile in Nigeria throughout much of the period between 1970 and 1995, as it was in many other developing countries. Figure 1 compares Nigeria’s inflation experience since 1970 with that of selected emerging-market comparator countries.2

It goes without saying that in practical terms the CBN did not place a high priority on inflation relative to the other objectives it was under pressure to pursue during the 1970-95 period, including most prominently providing cheap finance to government. The more important point, however, is that the costs the Nigerian economy absorbed from price instability did not produce offsetting benefits in terms of other macroeconomic objectives, like a stable real economy or a competitive exchange rate. Narrow interests in Nigeria may have benefited from monetary disarray, but in terms of macroeconomic outcomes the period as a whole was a disaster.

While the CBN operated a notionally fixed exchange rate regime during most of the period, there was no stable and coherent framework behind the overall conduct of monetary policy. Fiscal inconsistencies drove the authorities to adopt highly distortionary palliative measures like financial repression and exchange controls. Underlying inflation pressures then overwhelmed these at irregular intervals, sometimes gradually via real appreciation and increases in the parallel premium, at other times spectacularly via maxi-devaluations.

The IMF’s financial programming model provides a useful starting point for illustrating these pressures, and I use it below to motivate the CBN’s current framework. I then build

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2 Chile, Mexico and South Africa are inflation targeters (dates of adoption are in Table 2). Indonesia and Venezuela are oil exporters illustrating high and low fiscal discipline, respectively. All of these countries have non-trivial oil-based or mineral-based exposure to commodity booms and busts.
a bridge to the inflation targeting literature by interpreting the current system as a policy rule that targets the growth rate of nominal (non-oil) GDP.

2.1 Financial programming as a monetary policy framework

In line with its mission of providing temporary finance to countries in balance of payments crisis, the IMF’s central concern in its conditionality programs during the Bretton Woods era was balance of payments viability, rather than price stability *per se*. The aim was to restore external balance on a sustainable basis under fixed exchange rates, possibly following an initial devaluation. External balance was construed as achieving a given minimum path for net international reserves, which in turn implied a floor for the change in reserves, $\Delta NIR^\ast$.

Monetary conditions entered the picture as a way of ensuring that the reserves target would be met in a sustainable way. In particular monetary policy had to be kept tight enough to keep inflation and capital outflows in line and prevent the re-emergence of a balance of payments problem. This was achieved by imposing a ceiling on the change in net domestic assets, $\Delta NDA^\ast$. When binding, the $NDA$ ceiling would prevent the central bank from providing deficit finance to the government, or from satisfying the reserve target unsustainably via non-sterilized purchases of foreign exchange. As we’ll see shortly, it did this by reconciling the program with an inflation target already implicit in the fixed exchange rate regime.

Since the change in the monetary base is the sum of reserve accumulation and the change in net domestic assets, a Fund program implies a reference path for the overall monetary base: $\Delta H^\ast = \Delta NIR^\ast + \Delta NDA^\ast$. Commitment to this reference path is asymmetric, however, reflecting the dominance of the balance of payments objective: if the floor reserve on reserve accumulation is binding, as would be expected in a situation of balance of payments crisis, then the ceiling on $NDA$ expansion implies a ceiling on overall growth in the monetary base: $\Delta H \leq \Delta H^\ast$. But if reserve accumulation is faster than programmed, so that the balance of payments target is more than satisfied, the program allows a money base growth in excess of the ceiling, at a maximum rate equal to the ceiling on $\Delta NDA$ plus the excess accumulation of reserves.

The $NIR/\Delta NDA$ structure is still at the heart of IMF conditionality among countries with managed exchange rates (Blejer et al. 2001). Within Africa, in fact, and particularly outside the CFA zone, Fund conditionality and surveillance often operated as broad organizing framework for national monetary policy after 1970. Viewed as a monetary policy framework, what choices does financial programming make on the dimensions I outlined at the outset?

Beginning with price stability, consistency with an inflation target is in fact at the core of financial programming. To see this, define the velocity of broad money as $v = P \cdot y / M^2$ and note that if the central bank can project the change in velocity and the real growth rate of the economy as functions of observable variables, these projections imply an ‘inflation-consistent’ path for broad money. Converting the velocity expression to growth
rates (and using $\dot{x}(t) = \Delta x(t) / x(t-1)$ to denote the growth rate of any variable $x$), an inflation-consistent path for broad money must satisfy

$$\dot{M}^* = \pi^* + (\hat{\delta}^p - \hat{\nu}^p)$$

(1)

A target for inflation, $\pi^*$, therefore implies an intermediate target for broad money growth as a function of the projected growth in real money balances (the term in parentheses).

Defining the money multiplier as $m \equiv M2 / H$, the intermediate target for broad money growth implies a restriction on policy instruments that determine the growth in reserve money and/or in the money multiplier. An evolving array of instruments has been used to this end by African central banks. In the systems of direct monetary control that dominated until the 1990s, changes in reserve requirements often played a central role, operating through the money multiplier; the monetary base was manipulated through the placement of government deposits and operations in the primary market for government securities. More recently, control has shifted towards the monetary base and the use of indirect instruments including operations in secondary markets for government securities.

The NIR/NDA structure outlined above therefore has the core features of a monetary policy framework. Program objectives are a sustainable balance of payments and price stability. Once a projection for growth in the money multiplier is in hand, the price stability goal, as embodied in the program target $\pi^*$, is supported by ensuring that base money grows at something close to the reference rate,

$$\dot{H}^* = \pi^* + (\hat{\delta}^p - \hat{\nu}^p - \hat{m}^p).$$

(2)

With reserves on their floor path, equation (2) implies a ceiling for growth in NDA. This ceiling, together with the floor on reserve accumulation, becomes the focal point of an error-correction process, with Fund surveillance leading to periodic adjustments in projections, intermediate targets, and policy instruments.

Historically, communication with the Nigerian public in the context of IMF conditionality has tended to focus on the NDA constraint and its implications for fiscal austerity, with little further attention to the degree of tightness or ease implied by the programmed path for liquidity. Open discussions of the assumptions guiding monetary policy were perhaps beside the point; it could hardly have been clear in such cases whether the central bank was communicating its own intentions and interpretations or those of the Fund. But a deeper logic for this pattern is that overcoming fiscal dominance was in most cases the primary focus of these programs.

Both theory and practice suggest that when fiscal discipline is absent, establishing it is critical to macroeconomic stability. On the theory side, a mild amount of behavioral structure, when applied to the accounting laid out above, reveals fiscal discipline as the *sine qua non* for any central bank seeking to achieve joint macroeconomic targets for the
balance of payments and long-run price stability. The key elements are the classical
dichotomy, which de-links projected real growth of the economy, at least at long
horizons, from program deviations in monetary instruments; and an assumption that
velocity is reasonably stable. The second of these is highly suspect empirically, and
particularly so when inflation expectations are not well anchored in the short to medium
run. But especially under these conditions, the volatility of money growth and inflation
tends to dominate the volatility in velocity. Deviations in velocity and real growth
therefore cannot ‘rescue’ inflation or the balance of payments from excessive deficit
finance: excessive growth in NDA will create reserve losses and, sooner or later, acute
inflationary pressures. Attempts by the monetary authority to avoid these outcomes
through financial repression and exchange controls may briefly postpone the inevitable,
but only by creating macroeconomic distortions that undermine long-run growth.

2.2 Flexible exchange rates and reserve money programs
Running monetary policy from Washington, DC is unsatisfactory for a host of reasons,
including potentially sharp divergences between the Fund’s objectives in structuring
conditionality and those of the central bank. But as a consistency framework for
monetary policy the financial programming structure, with its emphasis on monetary
equilibrium and straightforward accounting relationships, is employed at least for
analytical purposes in central banks worldwide. Here I discuss how its application in
Africa evolved from a world of fixed exchange rates to the contemporary one of managed
floats.

While fixed exchange rate regimes played a central role in a number of disinflation
programs in emerging markets during the 1980s and 1990s, these arrangements proved
vulnerable to spectacular exchange rate and banking sector crises following the
liberalization of capital flows in these countries. Among emerging-market countries,
therefore, a shift away from exchange rate anchors over the past decade has been driven
by disenchantment with the viability of adjustable peg regimes under high capital
mobility.

In Africa, a move towards more flexible exchange rates was more closely associated with
the push to overcome fiscal dominance and remove damaging exchange controls (in
particular, to support a unified exchange rate for current account purposes). Containing
fiscal dominance remains a work in progress, but outside the Franc Zone, this took place,
starting in the 1990s, not only through legislative channels, with new charters designed to
enhance the independence of the central bank, but also through stabilization programs
that gave monetary aggregates clear operational priority over exchange rates as anchors
for disinflation. Dramatic cases include the cash budget arrangements operated under
IMF programs by Uganda, Tanzania and Zambia during the 1990s. These rules did not tie
down the change in net domestic assets, but they eliminated direct fiscal pressures on this
component of the central bank’s balance sheet.

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3 As an institution, the Fund’s objective is to maintain a stable international financial system. This means
among other things an aversion to depreciations that may spur financial contagion, and a strong interest in
protecting its claim on the country’s reserves.
In Nigeria, economic reforms initiated around 2000 and then accelerated during President Obasanjo’s second term have made major inroads in establishing fiscal discipline, mainly through innovations in the management of oil revenues. New legislation has meanwhile placed the CBN on an independent institutional footing. Monetary policy deliberations now take place within a flexible-exchange-rate version of financial programming. As in the traditional financial programming approach, there is no institutional commitment to an inflation target. Reflecting the shift of nominal anchors, there is also no commitment to the path of the naira. The centerpiece of the program is an inflation-consistent intermediate target for broad money growth, which serves as the framework’s nominal anchor and is derived as outlined in the previous section. There is no IMF lending program, and therefore no conditionality of the traditional sort, but the IMF plays a role in bolstering the credibility of the program, by providing advice and publicly certifying the achievement of jointly-agreed benchmarks.

Since the path of reserve accumulation is exogenous under a floating exchange rate, an intermediate target for M2 growth can be achieved, given a projection for the money multiplier, through balance-sheet instruments that determine the change in net domestic assets. In practice, however, the Nigerian program combines a cash-budget limit on net central bank financing of government with a ceiling on overall reserve money growth. By contrast with the NIR/NDA structure, and consistent with the dominance of money over the exchange rate as the program’s nominal anchor, the reserve money ceiling prioritizes the money growth objective while allowing for below-target reserve accumulation.

2.3 Targeting nominal GDP growth

The CBN’s reserve money approach, then, borrows heavily from the financial programming approach, both in its basic structure and in its application of program constraints that are designed, among other things, to protect inflation and the balance of payments from fiscal pressures. But while containing these pressures makes a coherent monetary policy viable, it tells us little about how monetary policy should respond to shocks to oil prices, droughts, or other macroeconomically important events.

In the academic literature and now increasingly among central banks, monetary policy is increasingly discussed and evaluated in the context of a fully-specified reaction function or policy rule, linking the central bank’s policy instrument to observable variables. The Taylor rule, discussed below, has played a central role in the theory and evaluation of inflation targeting (Taylor 1993, 1999). While no framework for monetary policy – including inflation targeting – can be reduced in practice to a mechanical reaction function, the structure of the CBN’s current framework resembles a money-targeting rule that monetarist economists have long advocated for industrial economies. The ‘McCallum rule’ (McCallum 1988, 2000) represents a recent version that I will use here to provide an analytical bridge between the CBN’s framework and inflation targeting.

In the McCallum rule, the policy objective is an inflation target, which may coexist with a concern to avoid volatility in the real economy. The intermediate target is the growth rate of nominal GDP. The policy instrument is the growth in reserve money, which is related to the intermediate target as in the financial programming approach, via
assumptions about the path of velocity. The McCallum rule determines the growth rate of reserve money as a function of program targets and observable variables, as follows:

\[
\hat{H}(t) = \hat{Y}^* - \hat{v}_m^*(t-1) + 0.5 \cdot [\hat{Y}(t-1) - \hat{Y}^*].
\]  

(3)

Here \(\hat{Y}^*\) is the targeted growth rate of nominal GDP and \(\hat{v}_m^*(t-1)\) is the projected growth in the velocity of the monetary base, constructed as an extrapolation of recent trends (McCallum uses the lagged 4-year average growth of velocity). Since \(Y = P \cdot y\) and \(v_m = v \cdot m\), the first two terms on the right-hand side of (3) are equivalent to \(\hat{H}^*\), the inflation-consistent rate of base money growth in equation (2). The McCallum rule therefore produces the same target path for the monetary base as a reserve-money program, provided that program assumptions are identical and the observed recent growth of nominal GDP is close to target (so that the final term in (3) is zero).

One apparent difference between (2) and (3) is that while equation (2) holds constant both an inflation target and a projected real growth rate, equation (3) refers directly only to the sum of these (the growth of nominal GDP). This difference matters, however, only if central banks implementing (2) respond differentially to information about program deviations in inflation and real growth. Nigeria’s reserve money program in fact employs nominal (non-oil) GDP growth rather than the inflation rate as its starting point. Since targeting nominal GDP accommodates countercyclical movements in inflation, this feature of equation (3) and the Nigerian framework may allow some degree of stabilization of the real economy in the face of temporary shocks to aggregate supply.

A second difference between equation (3) and Nigeria’s reserve money framework looks more revealing at first glance: equation (3) incorporates a well-defined, stable process of error-correction directly into the instrument rule, whereas in Nigeria’s case this process is continuing to evolve as the CBN develops its internal institutional structure. Again, this difference does not have to be fundamental in terms of the actual direction of policy; the feedback properties of Nigerian policy may already conform to a reasonably stable reaction function during the recent period of relative stability, e.g., since roughly 2000 – or may do so increasingly as institutional reforms are consolidated. If it does, then such a function may provide a useful, compact way of representing policy and communicating it to the public.\(^4\)

In practice, the CBN’s framework involves a tighter focus on responding to program deviations in its broad money target than in nominal GDP, in large part because the latter is not observed on a quarterly basis and perhaps not very reliably at longer horizons. Nonetheless, for the sake of illustration Figures 2 and 3 show the McCallum rule as applied to Nigerian and South African data for the period from 1995 to 2006.\(^5\)

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\(^4\) In the U.S., the Federal Reserve Bank of St. Louis regularly tracks the performance of both a McCallum rule and a Taylor rule (McCallum 2000).

\(^5\) The parameters of a McCallum rule – the nominal growth target, the response to projected velocity growth, and the feedback parameter on previous-quarter performance – can be estimated from the data, as Taylor (1993) and others have done for the Taylor rule, as an assessment of how closely the rule captures
Nigeria I use a target growth rate of nominal GDP of 20%, which is somewhat below the actual growth of 23 percent over the 2000-2006 period. The Nigerian results suggest that policy was loose, relative to a 20% target, during the late 1990s but that the period since 2000 has been consistent with a stricter target even in the face of rapid real-side growth (Table 1). For South Africa, where inflation targeting was formally adopted in the first quarter of 2000, I compare two targets; the 8.5% target combines a real growth assumption of 4 percent (slightly above the observed 4.1 percent for the 2000-2006 period) with the 4.5 percent midpoint of the CPIX target range of 3-6 percent (De Gregorio 2007, p. 18). The 11% rule would accommodate inflation at the top of its range and real growth of 5 percent. The two dashed lines illustrate the impact of changes in the intermediate target: given equation (3), the instrument rule shifts upwards by 1.5 units for each additional unit of targeted nominal GDP growth. The South African figure result suggests that reserve money growth rates were sharply higher in the mid 1990s than was consistent with the inflation target adopted in 2000; but they had converged by the time of adoption of the policy and have subsequently been consistent with the upper range of the inflation target and with a real growth assumption slightly more favorable than observed growth.

The CBN’s current framework, to summarize, can usefully be thought of as a reaction function that shares some features with a nominal GDP targeting regime that uses base money as its instrument. The role of the intermediate target undoubtedly looms larger in the Nigerian system than in (3), where it is suppressed by centering the exercise on the velocity of the monetary base.

The choice of instrument is not decisive in differentiating an inflation-targeting framework from the current Nigerian framework: as of 2003, for example, the Bank of Mexico implemented its inflation targeting system using the level of nonborrowed reserves as its instrument (Truman 2003). Nor is the level of communication with the public, or, as I have argued here, the ability to organize policy discussion or analysis around a simple reaction function. The implications of a rule like (3) for the stochastic properties of inflation and other macroeconomic variables can be explored by applying simulation methods to calibrated small-scale models of the macroeconomy or, in principle, by combining (3) with reduced-form econometric evidence on the transmission mechanism (the latter approach is likely to be of limited use in an environment of institutional change). In considering a move to inflation targeting in Nigeria, therefore, the key questions come down to a horse race between potentially viable alternatives. Does it make sense to put inflation rate much more formally at the center of policy commitments and evaluation? If so, how should the system should be designed? These topics are next, after a brief look at the characteristic features of inflation targeting.

2.4 Inflation targeting
In an inflation targeting framework, the central bank commits to achieving an announced numerical target (which is usually a number, with specified allowable deviations, such as 2.5 +/-1, but may be a range as in South Africa) for the rate of increase in a specified actual central bank behavior. This could be an interesting exercise, but my purpose here is to illustrate the potential relevance of the rule rather than to characterize CBN or RBSA behavior.
price index – usually the CPI, but in a few cases a ‘core’ CPI with volatile prices (e.g., of food and energy) excluded\(^6\) – over a specified time horizon, and then maintaining the target over time. Ranges are narrow: as indicated in Table 2, among emerging-market countries the average range is barely above 2 percentage points. The system implies a commitment to bring inflation back into range when it moves outside, but there is wide variation in the formality of commitments regarding the time horizon over which this is to be accomplished (Truman 2003, p. 65).

Bernanke and Mishkin (1997) characterize inflation-targeting as a system of ‘constrained discretion’ in the conduct of monetary policy. Constraint is imposed at the level of policy objectives, with the inflation target receiving clear precedence relative to other ultimate targets of policy, which may include competitiveness or stabilization of aggregate demand around potential. Deviations from the inflation target range require public explanation and a recommitment to achieving the target. The inflation rate becomes a focal point for public discussion and accountability. For the constraint to be credible, of course, the relevant inflation index must be publicly understood; and its measurement and availability must be free from the political pressures the system is designed to hold at bay.

Discretion prevails at the level of instruments, however, since the central bank is free to determine how it achieves the inflation target. Parameters of the system influence the range of discretion, which is higher the longer the horizon for achieving the target, the larger the specified target range, the fewer the escape clauses agreed in advance\(^7\), and probably the more comprehensive the inflation concept used (i.e., targeting core inflation allows greater scope for responding to other objectives than targeting headline inflation). These are important design issues on which the experience of structurally similar inflation targeters (e.g., countries exposed to substantial terms of trade shocks, fiscal instability, or with a large weight of volatile food prices in headline inflation) should be studied intensively.

The purpose of constraining objectives is to anchor private expectations of inflation, which decades of theory and inflation experience suggest can drive inflation independently of any short-run impacts of inflation on real variables. The simplest expression of this is an expectations-augmented Phillips curve of the type that governs the aggregate supply side in small-scale macroeconomic models:

\[
\pi(t) = E_{t-1}\pi(t) + \gamma \cdot [y(t) - \bar{y}(t)] + u(t),
\]

Here $\bar{y}$ is the level of potential output, a function of labor market structure and institutions to which the system would gravitate under wage and price flexibility. $E_{t-1}$

\(^6\) Of the 8 industrial and 13 emerging-market inflation targeters studied by Batini and Laxton (2007), all target the CPI except for Korea, Norway and Thailand who target the Core CPI and South Africa which targets the CPIX.

\(^7\) Truman (2003) finds that 7 of the 22 inflation-targeting central banks he studies, including South Africa, use escape clauses that specify in advance a set of situations in which the central bank is not expected to meet its target.
denotes a private-sector expectation formed in period $t-1$ and governing price- and wage-setting behavior in advance of the realization of inflation and real activity at time $t$, and $u$ is an unanticipated cost-push shock. By the classical dichotomy, the relation of actual output to $\bar{y}$ is independent of monetary policy in the long run. Accordingly, any level of expected inflation can in principle be validated on average, if the central bank, taking that expectation as given, finds it preferable in the short run to accommodate private expectations rather than resist them through tighter policy.

The role of discretion is to allow price stability to be attained at the lowest possible cost in terms of other macroeconomic variables of concern to the central bank. The Taylor rule provides a celebrated formalization of this idea and is widely used both as a description of the actual behavior of central banks and, in a large theoretical and empirical literature on inflation targeting, as a reaction function that delivers favorable outcomes for inflation and real-side volatility when embedded in stochastic equilibrium models of the aggregate economy (Woodford 2002). The original version (Taylor 1993) takes the form

$$i(t) = r + \pi(t) + 0.5 \cdot [\pi(t) - \pi^*] + 0.5 \cdot [y(t) - \bar{y}(t)],$$

where $r$ is the long-run equilibrium real interest rate, defined as the rate that would equate aggregate demand with $\bar{y}$ if wages and prices were flexible, and $\pi(t)$ is a recent inflation rate or an expected future rate. Policy responds both to deviations of inflation, or an inflation forecast, from the target, and to deviations of output from potential. The feedback parameters in (3) need not be equal; from a normative perspective (i.e., to achieve desirable outcomes for inflation and output volatility over time), variations would reflect the nature of the transmission mechanism and the relative weights given to inflation and the GDP gap in the monetary authority’s preferences. Given a standard description of the transmission mechanism, however, achieving the inflation objective requires a positive coefficient on the inflation deviation term in (3). This is the so-called ‘Taylor principle’ (Woodford 2002); it says that holding the output gap constant, the monetary authority must respond to an increase in observed inflation by increasing the short-term real interest rate $i(t) - \pi(t)$.

A monetary authority that targets inflation to the exclusion of any direct concern about output stabilization may still incorporate some weight on the GDP gap in a rule like (3), if responding to the current GDP gap improves its control over future inflation. The literature draws a useful distinction, however, between ‘strict inflation targeting’, in which the monetary authority is concerned only about inflation, and ‘flexible inflation targeting’ in which the monetary authority seeks to balance the welfare losses from output volatility against those associated with deviations of inflation from target. Under strict inflation targeting, the central bank brings inflation back to target as rapidly as possible, while flexible targeting produces a gradual adjustment of inflation to target. Although the latter better captures the ongoing use of discretion by inflation-targeting

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8 Contemporary treatments derive (4) from explicit microfoundations, and many end up replacing the expected inflation term with a function of expected future inflation. See Galí and Gertler (2007).
central banks, concerns about low credibility may justify a stricter approach when an inflation targeting framework is first introduced (Truman 2003).

3. Costs and benefits of moving to inflation targeting in the Nigerian context

While the CBN’s current system is consistent with an inflation objective, an inflation targeting framework pursues its objective directly, rather than through an intermediate target whose intrinsic significance may be obscure to the public. The inflation outcome, moreover, has to be controlled much more exactly and at shorter horizons. What precisely would be gained (or lost) in the Nigerian context by making this kind of commitment? I will be highly selective and start by posing the question in an environment of weak fiscal discipline.

Two main considerations emerge from the observation that overcoming fiscal dominance remains a work in progress in Nigeria. On the favorable side, the transparent commitments that characterize inflation targeting may bolster the CBN’s independence from fiscal pressures, by allowing the CBN to directly justify this independence in terms of its inflation objective. For this effect to operate, the system would have to have endorsement at the outset at the highest levels of government. If this endorsement is more readily forthcoming when times are good, then the current phase of strong macroeconomic performance may offer a window of opportunity for a transition that locks in the CBN’s de facto recent gains in institutional independence and, in effect, forces a more rapid gain in fiscal discipline that would otherwise have occurred. The analytical clarity of an inflation targeting program is also likely to greatly speed the central bank’s acquisition of technical capability.

However, tight commitments on inflation, and therefore on monetary finance, may be a dangerous game if the basic political economy constraints on achieving fiscal discipline cannot be overcome and the resulting volatile financing requirements must be met solely through highly inefficient fiscal adjustments or costly domestic or international borrowing. Spreads on Nigerian debt have fallen very sharply over the past five years, as indicated in Figure 3. While this reduction surely reflects the favorable impact of reforms on creditworthiness, the period has also been one of extremely favorable oil revenues. If efforts to bring the Nigerian states permanently on board with the prudent fiscal management of these revenues should fail, then the prospect of a fall in real oil prices brings with it a substantial medium-term risk of fiscal deficits at the state level, and possibly subsequent federal bailouts if these deficits are funded unsustainably. The mere expectation of these effects is likely to raise the risk premia on both domestic and foreign borrowing. As debt stocks increase, these interest rate effects may drive deficits up further in an unstable process, in the absence of adjustments in the primary deficit.9 A more accommodative policy at the outset might share the adjustment burden more efficiently between seigniorage and distortionary adjustments in fiscal policy, such that greater flexibility on inflation outcomes early on would more than repay itself in the

9 The ‘unpleasant monetarist arithmetic’ literature emphasizes the possibility of unstable links between monetary policy and inflation due to the fiscal impact of higher interest rates. Buffie (2003) applies this analysis to Sub-Saharan African countries.
medium run in terms of smoother adjustment, lower inflation, and better performance of the real economy.

Suppose now that both systems – the current one and inflation targeting – can be implemented credibly. Inflation targeting would anchor inflation expectations more tightly in the short to medium term; what impact would this have on the efficacy of monetary policy?

One of the leading weaknesses of frameworks that use monetary aggregates as intermediate targets is their vulnerability to mistakes in predicting velocity. Under strict financial programming, mistakes in forecasting velocity are transmitted to the real economy via swings in the liquidity conditions facing banks, and therefore potentially in the cost and quantity of long-term credit. Inflation targeting would allow shocks to money demand to be accommodated, initially via discretionary adjustment of the policy instrument (reserve money), and ultimately, once a shift is made to an interest rate as the main policy instrument, automatically. Moreover, since expected inflation is among the determinants of the demand for money, stabilizing expectations should have a salutary effect on the stability of portfolio behavior and therefore the volatility of shocks originating from this quarter.10

Fixing the exchange rate of course represents an alternative way of accommodating money demand shocks, through movements in international reserves. While a hard peg is inconsistent with inflation targeting, the scope for active exchange rate management in an inflation-targeting context is not yet clear in the theoretical literature, and I will return to this issue below. In practice, inflation-targeting central banks regularly intervene heavily (Edwards 2007).

Recent developments in Nigeria suggest a further, more subtle advantage of a system that focuses squarely on measuring and forecasting inflation over one in which performance on intermediate monetary targets serves as a focal point for error correction. To the degree that economic reforms since the early 2000s, in concert with conservative fiscal management of booming oil revenues, have increased confidence in the banking sector and reduced inflation expectations, the real demand for broad money may have risen considerably faster than it would have based on real-side growth and financial development alone. A framework that does not focus attention directly on the determinants of expected inflation, and on the transmission mechanism from changes inflation expectations to the real economy, may tend systematically towards an under-prediction of money demand growth during periods of favorable structural reforms and disinflation. This in turn means excessive monetary restraint. More importantly an operational focus on money growth rather than on inflation outcomes may exert a

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10 Buffie, et al. (2004) argue that the currency substitution now prevalent in many African countries, including Nigeria, increases the inflation elasticity of money demand and tightens the link between portfolio behavior and private sector expectations of future seigniorage. The fiscal management of foreign aid then plays a key role not just in determining not just the path of the equilibrium real exchange rate but also, via portfolio adjustments, in determining the short-run response of the nominal exchange rate and the degree of overshooting. Adam and Goderis (2007) apply this logic to Nigeria for the case of oil price booms.
‘judgmental’ contractionary bias even when inflation is correctly predicted to fall, out of a fear that rapid nominal money growth cannot be explained to the public without undermining confidence about inflation.

A further favorable effect of stabilizing inflation expectations may operate through endogenous adjustments in the degree of liability dollarization. Berg and Borenzstein (2000) and others suggest that dollarization creates difficulties for monetary policy management by increasing the sensitivity of domestic portfolio behavior to interest rates and exchange rates. De Nicoló, Honohan and Ize (2003) show that in systems of deposit dollarization, the risk differential in favor of foreign-currency deposits (over domestic-currency deposits) is an increasing function of the variance of inflation, and a decreasing function of the variance of the real exchange rate. This implies that a monetary policy framework that reduces the variance of inflation will tend, other things equal, to produce a reduction in the degree of dollarization (an effect that would be heightened if the system allowed a freer float of the exchange rate). This secondary benefit could become substantial if liability dollarization in the Nigerian banking sector were to increase from its relatively low current levels.11

Finally and importantly, many authors argue that stabilizing inflation expectations produces a virtuous circle by reducing the pass-through of inflationary shocks – e.g., to the exchange rate due to capital flows, or to food prices due to droughts – to wages or other prices. As a result smaller adjustments in policy instruments – and therefore smaller costs in terms of objectives other than inflation – are required to achieve a given outcome for inflation.

4. The naira in an inflation targeting framework

What role should exchange rates play in an inflation targeting framework in Nigeria? I focus on two aspects of this question. First, if the exchange rate is mainly floating, how should policy instruments respond to variations in the exchange rate? Second, does inflation targeting demand a free float, so as to avoid conflicts between the inflation objective and exchange rate objectives, or can the CBN simultaneously seek to manage the naira?

Responding at least indirectly to the naira is unavoidable in an inflation targeting setting, even if stabilizing the real exchange rate around some target level is not a separate policy objective. With an import share of nearly 40 percent (Table 3), Nigeria is subject to potentially significant pass-through from the exchange rate to domestic prices. While a system that successfully anchors inflation expectations may reduce the degree of pass-through, movements in the naira will remain a source of direct shocks to inflation and aggregate demand, the latter through the impact of nominal exchange rate movements on the real exchange rate. Even a framework that focuses only on inflation and the output gap will therefore respond indirectly to the naira.

11 De Nicoló, Honohan, and Ize (2003) report a ratio of foreign currency deposits to domestic deposits of 5.0 percent for Nigeria in 2001. This is by contrast to roughly 20 percent in Uganda and Kenya, 15 percent in Kenya, and 55 percent in Mozambique.
A number of inflation-targeting central banks appear to go beyond this indirect response. Edwards (2007) reports that estimated reaction functions for inflation-targeting countries often incorporate a direct response to the real exchange rate, with a real depreciation producing a monetary tightening (an increase in the policy interest rate) for given values of inflation and the output gap. While this pattern is consistent with the pursuit of a separate exchange rate objective, it does not imply such an objective. Ball (1999) shows that even under a pure float, a central bank that is concerned only about inflation and the GDP gap should respond directly to exchange rate movements as long as exchange rate movements affect the future path of these variables through channels that are additional to those operating through current inflation and the current output gap (in his model, exchange rate effects operate with a lag). Such channels are likely to be important in emerging-market economies, where pass-through is high and financial depth is low; Kamin, Turner and Van ’t dack (1998) emphasize that under such conditions the exchange rate may play at least as important a role in the transmission mechanism from monetary policy to inflation and aggregate demand as the (conventional) cost of long term borrowing. High levels of dollarization can push this argument further by exposing the banking system to exchange rate movements, a concern that could emerge to prominence in Nigeria if financial innovation were to produce more extensive dollarization.

Any feedback rule from overall inflation and the output gap will therefore involve at least an indirect response to the exchange rate, and from both a positive and a normative perspective a direct response, even under a pure float, is unexceptional.

The likelihood of a potentially substantial response to the naira leads to a set of concerns even under a float – i.e., in the absence of policy conflicts driven by separate exchange-rate objectives. Kumhof (2002) argues that if the exchange rate pass-through and capital mobility are sufficiently high, an inflation target may reduce to the virtual equivalent of a pegged exchange rate regime, with the attendant exposure to expectations-driven balance of payments crises. Caballero and Krishnamurthy (2005) make a related point in the context of ‘sudden stops’, crisis situations in which the supply of foreign lending terminates abruptly for reasons beyond the control of the monetary authority. In these situations, they argue, the interest-rate tightening called for by the Taylor rule may look appropriate at the time of crisis, as an attempt to prevent excessive depreciation, but will be suboptimal from an ex ante perspective. The problem is that if market participants anticipate this response ex ante, they will treat their domestic-currency claims as effectively insured against depreciation, and will take open positions that expose the economy to a greater likelihood of sudden stops and to larger costs in the event one occurs.

As yet, the favorable experience of emerging-market inflation targeters suggests that these concerns have been manageable. Many of the relevant experiences have taken place in a context of strong capital inflows, however – such as Nigeria is currently experiencing. The jury therefore remains out; these concerns may become much sharper in the context of a global recession or adverse movement in oil prices. A caution of
particular relevance for Nigeria is provided by Blanchard (2005), who studies the behavior of inflation targeting when fiscal dominance prevails and the conventional transmission of interest rates to aggregate demand is missing. In his analysis, a rise in the real interest rate produces capital outflows and a real depreciation and rather than the conventional real appreciation, by deteriorating the fiscal accounts and provoking an increase in the default-risk premium on government debt. There is a strong analogy here to the tight money paradox, the relevance of which for African central banks has been argued convincingly by Buffie (2003). In Blanchard’s account, imposing the ‘Taylor principle’ may destabilize inflation unless the primary deficit can be adjusted flexibly in response to a shifting interest burden.

These concerns about the viability of inflation targeting remain relevant if the exchange rate is a separate and potentially competing target of policy, or is believed to be so by a private sector that is unsure of the monetary authority’s objectives. As Reinhart and Rogoff (2001) have argued, limiting exchange rate volatility appears in practice to be a widely-held objective of central banks, even those who commit publicly to exchange rate flexibility. Inflation-targeting central banks do not appear to be an exception to this, as I pointed out above.

If real exchange rate volatility creates welfare losses that are separate from those generated by inflation or the output gap, then there would seem to be a straightforward normative case for inclusion of the real exchange rate, as a deviation from its long-run equilibrium, in the monetary authority’s reaction function. In Nigeria, these losses might be generated by the inability of domestic firms to hedge currency risks, and particularly to withstand the ‘Dutch disease’ impacts of temporary oil price movements on competitiveness. But the cautions mentioned above would then hold with potentially greater force; and quite separately, care should be taken to assess whether monetary policy is the appropriate locus of action for addressing costs associated with exchange rate volatility. Where the absence of hedging mechanisms is the problem, for example, a policy that stabilizes the exchange rate is likely to slow the development of markets for exchange-rate risk, by undermining their profitability. There is a potential substitutability here between financial management and financial development; ‘learning to float’ may be the better investment from a medium- to long-run perspective.

A similar point holds with respect to real exchange rate volatility. Using monetary policy to moderate swings in the real exchange rate – e.g., to prevent real appreciation during a commodity boom – can be a dangerous proposition, both because determining the equilibrium level of the real exchange rate is difficult and because both theory and experience suggest that in the absence of fiscal support, attempts to maintain a depreciated real exchange rate require some combination of higher inflation and/or higher real interest rates (Calvo, Reinhart and Vegh, 1995). In an inflation-targeting context – where inflation targets would not, presumably, be adjusted to support real exchange rate objectives – these pressures would be channeled inexorably towards higher real interest rates, raising the fiscal sustainability dangers I mentioned earlier. Achieving inflation targets may therefore require accepting substantial real exchange rate volatility. If this
volatility implies unacceptable costs, a framework that targets inflation less narrowly and explicitly may be more appropriate.

At a deeper level, if real exchange rate volatility in Nigeria is driven mainly by the response of public spending to oil revenues, then strengthening the fiscal management of these revenues is a superior approach to stabilizing the real exchange rate than one that leaves this task solely to monetary policy. Adam and Goderis (2007) discuss the appropriate coordination of monetary with fiscal policy in this context. A stabilization fund approach, if applied at all levels of government, would reduce the variance of government spending, and therefore of the equilibrium real exchange rate, around its long-run path. Monetary policy would then sterilize the domestic liquidity generated by oil-financed fiscal spending as it occurred, through sales of the corresponding amount of foreign exchange. This approach could readily be operated within an inflation-targeting context.

These observations return us to the fiscal management of resource rents and the question of whether inflation targeting represents too sharp a commitment under conditions of lingering fiscal dominance. As indicated in Table 3, Nigeria’s rents are an order of magnitude higher than those of existing inflation targeters. Even with fiscal discipline exerted by the center, the potential for unconstrained state governments to spend up to half of these rents on an annual basis suggests that in the absence of a fiscal arrangement to smooth at least the current component of this spending, movements in the equilibrium real exchange rate would be too large to offset without major changes in either inflation or real interest rates.12

A final observation relates to the coexistence of inflation targeting with managed floating. The theory and practice of inflation targeting developed among the industrial countries in the 1990s and then spread to middle-income emerging-market countries. Not surprisingly, therefore, open-economy models of inflation targeting typically assume very high capital mobility and leave no scope for the simultaneous pursuit of domestic targets and exchange rate objectives. Consistent with this, inflation targeting is often construed as requiring a pure float (e.g., Taylor 2001). Truman (2003), however, documents a wide variety of exchange rate regimes among inflation targeters, and suggests that active exchange rate management is not unusual. He argues persuasively that the key issue for the success of inflation targeting is not a pure float but rather a credible commitment that the inflation target will take precedence when there is a conflict, e.g., when the exchange rate reaches the outside of a band.

Stone (2003) brings a much larger set of countries under the inflation-targeting umbrella by introducing the concept of ‘inflation targeting lite’ (ITL), a category defined by the announcement of a flexible exchange rate and an inflation target or forecast, but without

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12 If public investment projects have high social returns by comparison with reserves, the associated real exchange rate pressures (given the nontraded component of infrastructure spending) are unlikely to justify retaining boom revenues as reserves. Nigeria’s experience from the 1970s and 1980s suggests, however, that there is a strong case for smoothing public capital spending as well as current spending, to ensure that high-yielding projects can be identified and implemented successfully.
a clear commitment to a single nominal anchor. Nigeria was not among these countries in late 2001, but its current framework would appear to qualify. Countries practicing ITL regularly intervene in foreign exchange markets, often with a view to maintaining financial stability. The literature offers very little guidance, however, on how multiple instruments—e.g., a policy interest rate and foreign exchange intervention—ought to be deployed when imperfect capital mobility allows the monetary authority some scope to reconcile domestic with external objectives. Little is known, for example, regarding the appropriate scale of intervention or the degree to which intervention should be sterilized (Edwards 2007). Analytical work on these issues is likely to begin emerging as the group of inflation targeters gets wider; meanwhile an appropriate presumption is probably that the degree of capital mobility is rapidly increasing in Nigeria, and that while some scope for active exchange rate management likely exists, overemphasizing exchange rate objectives may carry significant risks.

5. Conclusions

The most serious precondition for any coherent monetary policy framework, a lack of fiscal dominance, is in process of being established in Nigeria but is by no means a fait accompli. Moreover, the macroeconomic situation remains rosy, notwithstanding ongoing difficulties in the oil producing areas. The tradeoffs facing the current framework are therefore mild relative to those that may emerge once oil prices fall. The appropriate question regarding adoption of inflation targeting is not, however, whether conditions are optimal for its adoption, or even whether they are sufficiently favorable to guarantee against a reversal. The question is whether inflation targeting is likely to be superior to other alternatives.

I have argued that the current system represents a coherent framework, and that within this system the CBN can continue to advance rapidly in terms of technical capability, transparency of communication with the public, and other attributes that will improve both the operation of monetary policy and the readiness for a move to inflation targeting. But while the current framework imposes some tight constraints, it does not commit the CBN to the Nigerian public in the same way that an inflation targeting system does, and at its best it is unlikely to stabilize expected inflation to nearly the degree that an inflation targeting framework would. Batini (2004) concludes her insightful analysis with a ‘second-best’ endorsement of moving to inflation targeting, and on balance I agree. The most significant contribution to unalloyed success would be a political agreement that establishes credible fiscal management of oil revenues at all levels of government. The absence of such an agreement would make for a riskier path but would not, in my view, overcome the advantages of adoption as a mechanism for pushing the pace of institutional change within the CBN, enhancing the transparency and accountability of policy, and focusing public discussion on the limitations of monetary policy and the ongoing need for fiscal discipline.
References


Figure 1. Inflation in Nigeria and some comparator countries, 1970-2006
Figure 2. Nigeria: Simulated McCallum rule from 1995q1.

Source: IFS and author’s calculations.

Figure 3. South Africa: Simulated McCallum rule from 1995q1.

Source: IFS and author’s calculations.
Figure 3. EMBI+ spreads for Nigeria and all emerging-market countries.

![EMBI+ spreads](image)

Source: JP Morgan.

Figure 4. Real effective exchange rate decompositions, Nigeria and selected others

![Real exchange rate decomposition from 2000:1](image)

Source: Calculated from IMF real and nominal effective exchange rate indexes (increase = appreciation). The REER is given by REER = NEER*RELP, where RELP is the ratio of domestic to trade-weighted foreign price indexes. I rebased all three indexes to 2000 = 1.0 and then took logs (so that log of the 2000 value = 0).
### Table 1. Inflation and growth in Nigeria and South Africa, 2000-2006

<table>
<thead>
<tr>
<th></th>
<th>Average annual growth rate (%)</th>
<th>Nigeria</th>
<th>South Africa</th>
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<tr>
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<td>Nominal GDP</td>
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<td>7.0</td>
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Source: IMF, IFS online.

### Table 2. Characteristics of inflation targeting arrangements

<table>
<thead>
<tr>
<th>Country</th>
<th>Beginning</th>
<th>Range</th>
<th>Target</th>
<th>Horizon</th>
<th>Selects target</th>
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<td>CPI</td>
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**Emerging market countries**

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<th>Target</th>
<th>Horizon</th>
<th>Selects target</th>
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**Industrial countries**

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Source: De Gregorio (2007), p. 18. ‘Horizon’ is the number of quarters over which the inflation rate is expected to have converged to the currently specified target. ‘Selects target’ indicates whether the central bank (CB), government (G), or both chooses the inflation target.
Table 3. Selected indicators for emerging-market inflation targeters and Nigeria

Averages, 1998-2000 except where indicated

<table>
<thead>
<tr>
<th>Emerging market inflation-targeting countries</th>
<th>PPP-adjusted real GDP per capita (constant 2000 international $)</th>
<th>Resource rents as share of GNI (%)</th>
<th>Imports as share of GDP (%)</th>
<th>M2 as share of GDP (2003-2005) (%)</th>
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<td><strong>1.9</strong></td>
<td><strong>36.7</strong></td>
<td><strong>53.5</strong></td>
</tr>
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</table>

**NIGERIA**

|                                           | 872 | 35.1 | 38.9 | 27.0 |

Sources: Real GDP per capita from PWT6.1; mineral + energy + forest rents as share of GNI, and imports as a share of GDP from World Bank; M2 as a share of GDP from IMF.