

Moving to an Inflation-Targeting Regime

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INTRODUCTION

Morocco is expected to adopt an inflation-targeting framework after measured preparations, having carefully weighed pros and cons. Other countries adopted inflation targeting because “monetary targets abandoned them,” the country needed a disinflation mechanism, a financial crisis made a peg noncredible, or because other monetary frameworks failed to provide macroeconomic stability. In contrast, over the past two decades, in Morocco the exchange rate peg has not been under pressure (except some tensions at the onset of the COVID-19 pandemic) and the economy has shown remarkable nominal stability, with consumer prices only marginally more volatile than in the euro area.

Rather, the Moroccan authorities signaled as early as the mid-2000s their intention to move toward a more flexible exchange rate regime and eventually to inflation targeting, as part of a more general series of reforms aimed at reinforcing the Moroccan economy’s resilience and growth potential. The main motivation has been that such a regime would increase the maneuvering space for macroeconomic policies and cushion the economy from real external shocks while keeping the dirham competitive.

The authorities understood early on that a successful regime switch will require three basic elements, namely (1) the various policymaking institutions must accept the need for reform and support the reform steps, (2) the reforms involve many interlinked steps under an overall framework, and (3) the staff in the government agencies must be trained and equipped with appropriate technical tools.

Although progress on these fronts slowed during the global financial crisis, it was rekindled in the early 2010s, supported by extensive domestic consultation and IMF-led technical assistance, including on a new policy modeling framework (Benlamine and others 2018). The preparatory work has continued in the aftermath of the COVID-19 pandemic crisis, again supported by IMF-led technical

We are grateful to Roberto Cardarelli for comments. Jing Xie provided excellent research assistance.

assistance in 2020–22. On the policy front, in January 2018 Morocco changed its official arrangement from “conventional peg” to “pegged exchange rate within horizontal bands” when the fluctuation band for the dirham was widened to ± 2.5 percent; in March 2020 the band was further widened to ± 5 percent.

In this chapter Morocco’s monetary policy trade-off is outlined and the gradual process of external liberalization and transition to inflation targeting is mapped. The chapter then sketches the innovative features of the Morocco Quarterly Projection Model designed to capture monetary policy independence under a peg and capital controls. In the analytical section, the macroeconomic stabilization advantage of a counterfactual floating regime over the current peg regime is shown by exploring both deterministic and stochastic simulations of a scenario with initial conditions like those of 2020. The final section offers a conclusion.

MOROCCO: MONETARY INDEPENDENCE UNDER A PEG AND CAPITAL CONTROLS

Following the creation of the dirham in the 1950s, Morocco has combined a fixed exchange rate and capital controls to retain a degree of monetary policy independence. Presently, Morocco pegs the dirham against a basket of the euro and US dollar, and it limits capital account transactions to keep control over short-term domestic interest rates and other instruments of monetary policy, such as reserve requirements.¹ Some fluctuation of the dirham is allowed within a band, which the Moroccan authorities have widened first from ± 0.3 percent to ± 2.5 percent in January 2018 and then further to ± 5 percent in March 2020. Even though these adjustments are a part of the gradual process toward a more flexible exchange rate and inflation targeting, the exchange rate continued to serve as the main nominal anchor, pinning down the aggregate price level and wage growth.

The choice of such a monetary policy framework reflected the empirical observation that no country can achieve simultaneously a fixed exchange rate, free capital mobility, and an independent monetary policy dedicated to domestic goals (Obstfeld, Shambaugh, and Taylor 2005; Rey 2013). The so-called impossible trinity argues that to retain control over short-term interest rates, the authorities have two options. The first is to float the exchange rate and identify an alternative nominal anchor, such as an inflation target. Arbitrage based on flow of capital will ensure that the depreciation or appreciation of a country’s currency vis-à-vis another will reflect the nominal interest rate differential between these countries. The second is to continue pegging the exchange rate and suspend the uncovered interest rate parity condition by limiting the flow of capital in and out of the country. If the capital controls are sufficiently restrictive, a differential between

¹ The Moroccan dirham was pegged to the French franc from the time of independence in 1956 until the Bretton Woods system collapsed in 1973, followed by a peg to a basket of eight currencies. In the early 2000s the basket was narrowed to the euro and US dollar with respective weights of 80 percent and 20 percent, and in 2015 these weights were changed to 60 percent and 40 percent.

the domestic and world rates can persist without putting pressure on the peg and the country's international reserves.²

Morocco started relaxing its comprehensive system of foreign exchange controls in the 1980s, removing most barriers related to exports and imports of goods and services. Still, the less-visible system of import tariffs and import controls has remained in place. Outward capital transactions were relaxed for residents, and remittances of capital and related nonresident incomes were liberalized; however, foreign-currency denominated loans need to be authorized by the Moroccan Office of Foreign Exchange. Whereas restrictions related to inward investments were relaxed, outward restrictions remain binding (Taamouti 2015; IMF 2015), and the 2018 update of the Chinn-Ito financial openness index ranks Morocco in the second most restrictive group.³

Morocco's monetary policy choice has reflected the authorities' preference for a relatively tightly controlled economic system for capital flows. On the one hand, this approach has contributed to the overall macroeconomic stability experienced by the country from the late 1990s: during this period, Morocco has been largely insulated from the global financial cycle, avoiding financial bubbles, the build-up of unsustainable private, foreign-currency debt, and other issues often observed in emerging market countries with unrestricted flows of capital (Reinhart and Reinhart 2008). Predictably, nominal stability came at the expense of the ability to adjust to real shocks. For example, the negative productivity shock at the onset of the global financial crisis resulted in real effective depreciation of the dirham to the tune of about 9 percent by 2012 as compared to the pre-global financial crisis period (see IMF 2016 and *International Financial Statistics*). With a stable nominal exchange rate, the adjustment came about through the internal devaluation process, namely price and wage growth below the rate of Moroccan trading partners.

On the other hand, Morocco's monetary policy and exchange rate regime may have limited Morocco's ability to meet the international competitiveness challenges and to absorb external shocks.⁴ Indeed, over the last two decades the active stabilization role of monetary policy in Morocco has been less pronounced than in countries with a floating exchange rate and an open capital account. Domestic policies have been focused instead on the achievement of the dual external objectives of exchange rate stability and sustainable international reserves. For example, the Bank Al-Maghrib (BAM) policy rate moved only 13 times during 2000–20, whereas most small open-economy central banks made three times as many adjustments to their key interest rates. BAM has instead relied on non-interest instruments of monetary policy, such as reserve requirements.

² From 2006, the operational target of the central bank has been the interbank weighted average rate, which the central bank has managed using two tools: adjusting the key policy rate and changing the required reserve ratio of the banking sector (Taamouti 2015). The interbank rate has been set with a broad view of achieving price stability, without an explicit inflation target, and supporting economic growth. The partly closed capital account has supported the Bank Al-Maghrib's efforts to keep the interbank rate at the desired level.

³ http://web.pdx.edu/~ito/Chinn-Ito_website.htm.

⁴ See Bank Al-Maghrib (2016, 21).

BAM was able to mount an effective response to the financial and liquidity tension created by the COVID-19 shock, and the widening of the band around the peg has allowed monetary policy to play a more active stabilization role than in the past. Still, even with the wider band, it remains the case that keeping the peg on the dirham could constrain the authorities' range of policy options to respond to future real shocks and, in particular, to those (like terms of trade and real interest rate shocks) that can result in changes of the equilibrium real exchange rate. Under a peg, the adjustment in the real exchange rate will need to take place mainly through changes in domestic nominal prices and domestic wages, which tend to be associated with deeper and longer contractions of economic activity (Edwards and Levy Yeyati 2005).⁵

The consensus view is that the economy's transmission mechanism tends to be less effective in the case of a peg and closed capital account than under a flexible exchange rate regime and free capital flows. Interventions in foreign exchange markets leave less scope for the functioning of the conventional interest rate channel and the asset channel, whereas the nominal part of the exchange rate channel is closed. Regarding the asset channel, capital controls are likely to slow down the development of well-functioning markets for fixed-income securities, equities, and real estate. Furthermore, effectiveness and reliability of the bank lending channel can be constrained by the oligopolistic structure of the banking sector due to barriers to entry into the domestic capital market (Benazzi and RouieSSI 2017).

A MONETARY POLICY MODEL FOR MOROCCO

In this section a trend-gap macroeconomic model is introduced that is then used in the next section to simulate developments under the current regime and an alternative policy regime, where the central bank targets inflation and the exchange rate is floating. The model is a somewhat simplified version of the framework used in BAM. The Morocco Quarterly Projection Model was developed during 2015–16 with the help of IMF-led technical assistance to support BAM's monetary policy decision making during the transition toward a more flexible exchange rate regime and eventual adoption of full-fledged inflation targeting (Benlamine and others 2018).

To this end, the model was designed to accommodate both the existing fixed exchange rate framework with capital controls and an alternative of a floating exchange rate and gradually increasing capital mobility. The main difference between the two regimes is in their choice of the long-term nominal anchor (Table 3.1). In the current fixed exchange rate regime, the fluctuation corridor

⁵ Policy recommendations differ between flexible and fixed regimes. Let us consider a situation when the expected domestic output gap turns negative. Under a float, the authorities will be expected to loosen monetary policy, quickly depreciating both the nominal and real exchange rate as inflation expectations remain anchored. Under a peg, the authorities typically choose to tighten monetary conditions to protect the peg, with inflation eventually declining beyond the recession-induced developments, thus depreciating the real exchange rate.

TABLE 3.1.

Modeling Solutions to Regime Differences		
	Fixed Exchange Rate Regime with Capital Controls	Flexible Exchange Rate Regime
Nominal exchange rate	The nominal exchange rate is an exogenous policy choice variable, and without an ad hoc policy decision its value does not change.	The nominal exchange rate is determined by investors' portfolio choice, reflecting the expected relative return of domestic assets, proxied by the money-market interest rate differential adjusted for the risk premium. The arbitrage condition is described by the risk-adjusted uncovered interest rate parity condition.
Domestic interest rate	Limited capital mobility gives the central bank some independence to influence the money-market rates. The policy reaction function is (1) highly persistent, (2) inflation aversion is relatively weak, and (3) the overall interest rate is a hypothetical "rate" that reflects the fact that most domestic agents borrow at "domestic" rates whereas some can borrow at "foreign" rates.	The domestic interest rate is the main policy instrument and it is modeled as the standard inflation forecast-based reaction function (Berg and others 2006; Clark and others 2001). It describes a policymaker stabilizing inflation around the target and minimizing shortfalls in capacity utilization.

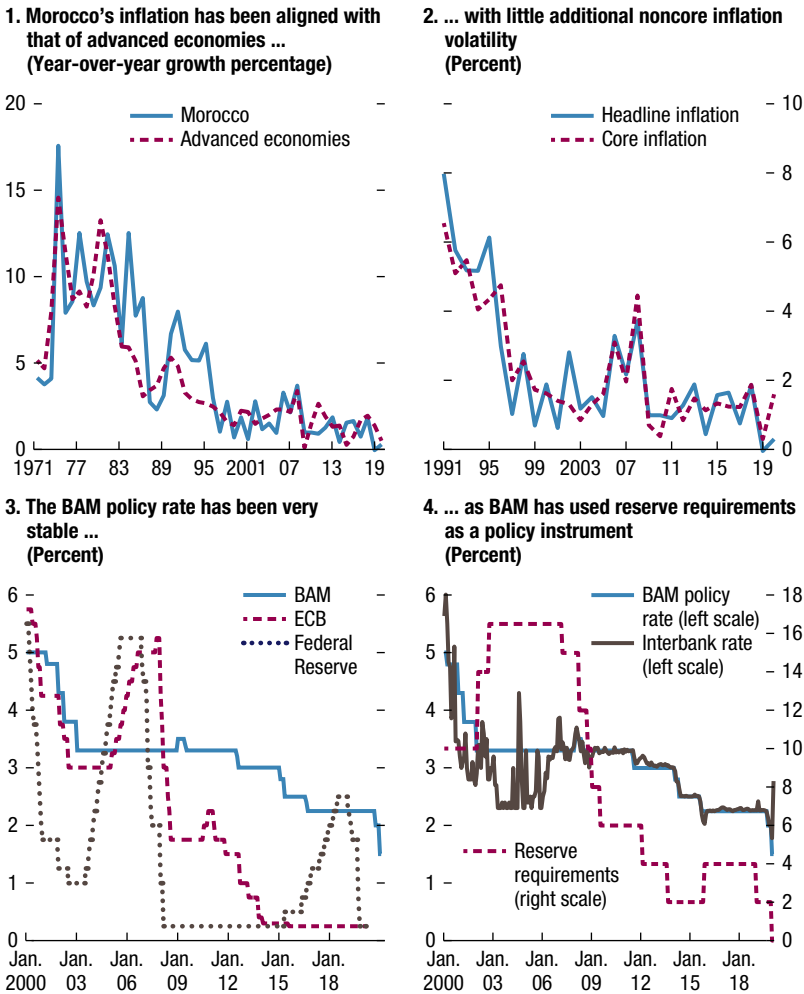
Source: Benlamine and others (2018).

notwithstanding, the anchor is the nominal exchange rate, whereas other nominal variables—inflation and nominal interest rates—are determined endogenously. In the flexible regime, it is the long-term rate of inflation, as defined by an explicit inflation target, that serves as the nominal anchor, and the interest rate, exchange rate, and inflation are determined endogenously. The key differences between the two regimes are captured in two blocks of the model: the exchange rate and interest rate equations.

The model structure and its calibration reflect a few well-known features of the Moroccan economy. First, Morocco is a small open economy, highly sensitive to external developments, especially in the euro area. This feature requires that the forecasting framework accounts for developments in foreign demand and commodity prices, especially oil and food. Second, domestic agriculture is an important source of output volatility, warranting a decomposition of GDP to agricultural and nonagricultural sectors. Third, the structure of Moroccan value added has begun to change as the automobile and other export-oriented sectors grow faster than domestic demand. Fourth, whereas investment has been linked to centralized infrastructure projects and foreign direct investment inflows, consumption has been driven by household decisions linked to agricultural production and inflows of remittances.

Fifth, Morocco has had low headline inflation, comparable to developed economies, averaging only 1.5 percent (Figure 3.1). The sizable weight of volatile food items—at 39 percent in the 2007 basket, the share of food in the Consumer Price Index basket is more than twice the share as in the euro area basket—and items with regulated prices warrant a decomposition of the Consumer Price Index to core inflation and other subindexes. Sixth, given the

Figure 3.1. Inflation and Monetary Transmission



Sources: IMF, International Financial Statistics and World Economic Outlook databases; Morocco Quarterly Projection Model database; and national data.
 Note: BAM = Bank Al-Maghrib; ECB = European Central Bank.

sizable weight of the euro in the basket, any change in the euro-to-dirham exchange rate is quickly translated into core inflation. Seventh, the changes in the interbank rate, which has evolved in line with the BAM policy rate, have been relatively quickly translated into lending rates. The last two stylized facts thus suggest the presence of both significant exchange rate and interest rate channels in Morocco.

COMPARISON OF THE FIXED AND FLOATING POLICY REGIMES

In this section is demonstrated the stabilization advantage of the floating regime over the peg by exploring two impulse-response functions and a stochastic simulation of a scenario with the 2020 initial conditions. For the sake of simplicity, the model structure and calibration are kept identical under both regimes, except for two equations: the uncovered interest rate parity and the policy reaction function. This approach follows the two-regime version of the Morocco Quarterly Projection Model (Benlamine and others 2018) and the modeling framework in Baksa, Bulíř, and Cardarelli (2021). The general finding is that the model economy, which is designed to mimic the key features of the Moroccan economy, is easier to stabilize with a flexible exchange rate than with a fixed one.

A Deterministic Comparison: Impulse Response Functions

We start by comparing key macroeconomic developments in a deterministic setting. The impulse response functions plot the response of the model economy to temporary 1 percentage point shocks to: (1) core inflation (Figure 3.2) and (2) domestic demand (Figure 3.3). These results broadly replicate the standard results found in the policy modeling literature while considering Morocco-specific calibrations.

Both regimes are comparable in stabilizing inflation; however, stabilization is delivered through different channels. Under the peg, the exchange rate does not move and the domestic interest rate moves only very little because it supports the objective of exchange rate stability. The interest rate channel plays only a minor role in responding to inflation and aggregate demand shocks. The policymaker relies instead on the exchange rate channel operating through the inflation differential vis-à-vis the trading partners. Real exchange rate misalignments are addressed through internal devaluation that returns the price level to its initial value, necessitating a long-lasting period of inflation and output below the steady state.

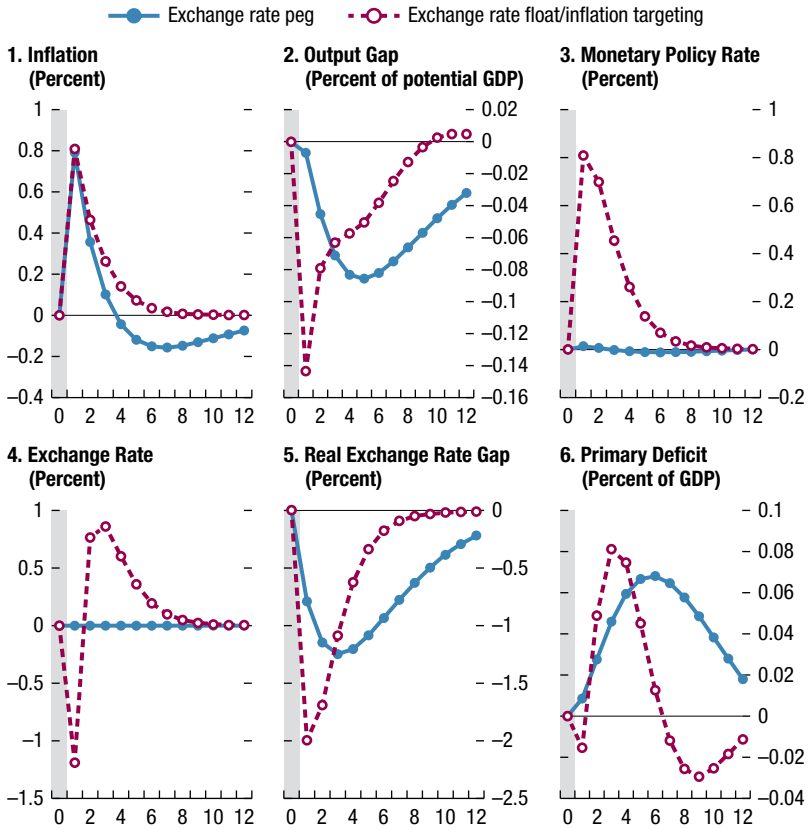
Under the floating exchange rate regime and inflation targeting, the policymaker is free to adjust both the interest rate and the exchange rate. The interest and exchange rate channels both operate and there is no need for a long period of internal devaluation—the nominal exchange rate adjusts quickly. The real exchange rate misalignment is addressed through nominal depreciation, with the price level settling at a new steady state. Crucially, the period needed to bring inflation and output back to their long-term trends under the float is shorter than under the peg.

A Stochastic Simulation of an Adjustment Scenario

The stochastic simulations confirm the intuition from the previous section—a pegged regime as compared to a floating regime results in (1) larger output losses when the economy is exposed to a negative demand shock and (2) larger volatility

Figure 3.2. A Positive 1 Percent Shock to Domestic Costs
(All variables are expressed as deviations from the steady state)

A temporary positive 1 percentage point shock to core inflation leads to higher headline inflation and causes the real exchange rate to appreciate.

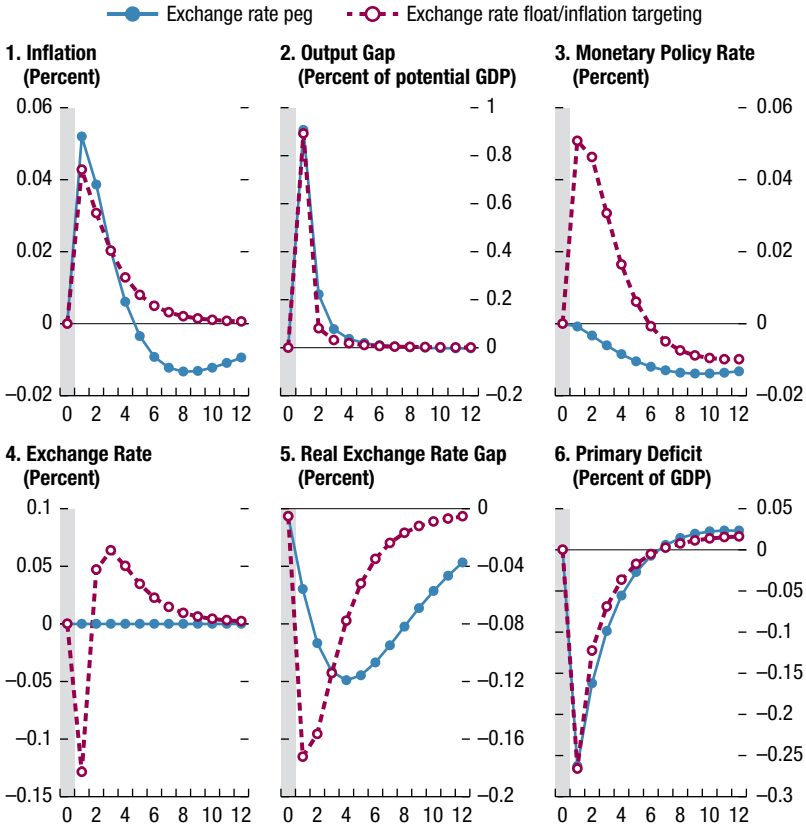


Source: Authors' simulations.

Note: Under a flexible exchange rate regime and inflation targeting (dashed red line), the policymaker tightens monetary policy but allows the exchange rate to depreciate in nominal terms, quickly extinguishing the initial exchange rate overvaluation. Under a peg (solid blue line), the policymaker keeps the nominal rate unchanged, and the initial overvaluation is addressed through internal devaluation—a long-lasting period of output below its trend level is needed to keep inflation below the steady state and to return the economy to the initial price level. Inflation is the year-over-year percent change in the Consumer Price Index; the output gap is defined as the percent deviation of actual GDP from its potential; the exchange rate is the dirham-to-euro rate, with a positive value indicating depreciation and a negative value indicating appreciation; the real effective exchange rate gap is defined as the percent deviation of the actual real exchange rate from its trend value; and the primary deficit is measured as revenue minus expenditure, excluding interest payments, adjusted for the business cycle. All variables are in annual frequency and are expressed as deviations from the steady state.

Figure 3.3. A Positive 1 Percent Shock to Domestic Demand
(All variables are expressed as deviations from the steady state)

A temporary positive 1 percentage point shock to nonagricultural GDP overheats the economy, creates inflationary pressures, and appreciates the real exchange rate.



Source: Authors' simulations.

Note: Under a flexible exchange rate regime and inflation targeting (dashed red line), the policymaker briefly tightens monetary policy to close the output gap but allows the exchange rate to depreciate in nominal terms after the first year to offset the initial real appreciation. Under a peg (solid blue line), the policymaker keeps the nominal rate unchanged, and overvaluation is extinguished through long-lasting internal devaluation. Inflation is the year-over-year percent change in the Consumer Price Index; the output gap is defined as the percent deviation of actual GDP from its potential; the exchange rate is the dirham-to-euro rate, with a positive value indicating depreciation and a negative value indicating appreciation; the real effective exchange rate gap is defined as the percent deviation of the actual real exchange rate from its trend value; and the primary deficit is measured as revenue minus expenditure, excluding interest payments, adjusted for the business cycle. All variables are in annual frequency and are expressed as deviations from the steady state.

of the output gap and inflation. The interest and exchange rates are more volatile under the float; however, they are on average closer to the steady state—a result stemming from the faster adjustment under the float.

The previous simulation is extended for two additional features: namely, the simulation is initiated away from the steady state and the economy is hit with shocks afterward. Specifically, the behavior of the model economy is explored—under the two policy regimes—(1) when faced with a set of initial adverse conditions similar to those prevailing in 2020 (that is, a post-COVID-19 recovery path) and (2) when buffeted with normally distributed random shocks to external and domestic demand, fiscal variables, inflation, and the country risk premium. These shocks are auto- and cross-correlated and broadly reflect past domestic and external developments. The initial conditions encompass the collapse in global and domestic demand, an increase in the country risk premium, a sharp drop in oil prices, and a massive fiscal impulse that pushed the debt-to-GDP ratio over the fiscal target. The simulations were run for 15 years for both regimes, repeated 1,000 times, and the sample results were averaged for the first and second moments of the key variables of interest (the output gap, headline and core inflation, the nominal interest and exchange rate, and the cyclically adjusted primary fiscal deficit in percentage of GDP). Hence, relative to the previous section, not just the levels but also the variability of the key variables were compared.

Recall that the exchange rate moves only under the float and that the movement in the domestic interest rate under the peg is limited in order to support the exchange rate. Both regimes must deal with the rapidly increasing debt, and it was assumed that the authorities will attempt to bring the debt-to-GDP ratio back to the target of 60 percent over the medium term while considering the demand effects of the fiscal consolidation. The fiscal reaction function is identical for both regimes and is of the type proposed by Plödt and Reicher (2015).

These simulation results expand on the general point that the model economy would stabilize faster and with lesser output cost under a flexible exchange rate regime than under a peg (Table 3.2). Cumulative output losses are higher by one-third under the peg: the 15-year average of the output gap is -0.8 percent and -0.5 percent under the peg and float, respectively. Output is also marginally more volatile under the peg during this period. Similarly, inflation is expected to undershoot the 2 percent inflation objective more when the exchange rate is fixed, and it is expected to be more volatile. These results hold for both headline and core inflation. The nominal interest rate is on average higher by some 30 basis points under the peg as it must offset the initially higher risk premium, albeit it should be less volatile later in the sample period. In real terms, the interest rate is on average some 50 basis points higher under the peg. The exchange rate is the shock absorber under the float—it depreciates marginally in nominal terms, but it is much more volatile. The fiscal results are virtually identical under either regime as the fiscal rule ensures a gradual return to the debt target.

The results of the stochastic simulations corroborate the findings from the impulse response functions, namely that the Moroccan economy should benefit from a more flexible exchange rate and active monetary policy. Output and

TABLE 3.2.

Stochastic Simulation Scenario: Peg versus Float Comparison
(Sample average of 1,000 stochastic simulations)

	Peg	Float/IT
Averages		
Output gap	-0.8	-0.6
Headline inflation	1.5	1.7
Core inflation	1.5	1.7
Nominal interest rate	1.9	1.6
Nominal exchange rate (positive number implies depreciation)	-0.1	0.1
Primary fiscal deficit	0.3	0.4
Standard Deviations		
Output gap	3.8	3.6
Headline inflation	1.1	0.9
Core inflation	1.6	1.4
Nominal interest rate	0.8	1.4
Nominal exchange rate	0.2	3.3
Primary fiscal deficit	7.6	7.6

Source: Authors' simulations.

Note: The initial conditions of the simulation resemble developments in mid-2020 (a collapse in global and domestic demand, an increase in the country risk premium, a sharp drop in oil prices, and a massive fiscal impulse). Over the simulation period the model economy is also buffeted with normally distributed random shocks to external and domestic demand, fiscal variables, inflation, and the country risk premium. These shocks are auto- and cross-correlated, and these correlations broadly reflect past domestic and external developments.

Inflation is the year-over-year percent change in the headline Consumer Price Index; core inflation excludes food and energy; the output gap is defined as the percent deviation of actual GDP from its potential; the nominal interest rate is the three-month interbank rate; the exchange rate is the dirham-to-euro rate; and the primary deficit is measured as revenue minus expenditure, excluding interest payments, adjusted for the business cycle. All variables are in annual frequency. IT = inflation targeting.

inflation stabilization gains under the float more than offset the costs of exchange rate and interest volatility. Neither regime is superior with respect to the fiscal balances that will have to be repaired after the COVID-19–related debt shock in 2020.

CONCLUSION

The simulations presented in this chapter, which use alternative modeling frameworks, show that the Moroccan economy would benefit from a more flexible exchange rate and active monetary policy guided by a formal inflation target. The output and inflation stabilization gains under the inflation-targeting monetary policy regime with floating exchange rates more than offset the additional costs of exchange rate and interest volatility. Although BAM remains committed to an eventual switch to a floating exchange rate and inflation targeting, the switch needs to be carefully administered and reflected in the BAM modeling framework. The policy reaction function will need to be refined as the policymaker's past behavior under the fixed exchange rate regime will provide limited guidance for the new regime. The legacy of the COVID-19 pandemic and the war in Ukraine, and the resulting shifts in world demand for Moroccan exports, as well as the structural reforms launched by the Moroccan authorities, will have had profound, long-lasting impacts on economic growth and employment, necessitating a thorough review of the relationships embedded in the forecasting and policy analysis system.

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