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MOROCCO

Selected Issues

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Approved by Middle East and Central Asia Department

July 21, 2005

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A. Introduction

1. The macroeconomic environment in Morocco has been stable along many dimensions for more than a decade. Inflation has remained low, the balance of payments in surplus, international reserves high, and the public debt to GDP ratio has declined. Growth, however, has been weak and below that of comparable developing countries during that period. This chapter's objective is to attempt a diagnostic of Morocco's growth performance over the past thirty-five years with a special focus on the more recent past.

2. Section B presents stylized trends in growth. It first puts the overall growth performance of Morocco in international perspective, including an analysis of the evolution of growth volatility. It then decomposes growth by major sectors to retrospectively identify patterns of structural transformation as well as the most dynamic sectors. It continues with a decomposition of the demand side, highlighting in particular the evolving contributions of public expenditure and external demand over time. Finally, it analyzes flows of foreign direct investment.

3. Section C focuses on the accumulation of factors of production and total factor productivity growth through a growth accounting exercise. Following an estimation of a Cobb-Douglas production function for the Moroccan economy using time series techniques, overall growth is decomposed by factor and by period. Given the duality between the primary and nonprimary sectors in Morocco, a similar decomposition is done for the nonprimary sector before conclusions are drawn. The recent trends uncovered by the analysis are then used to construct three illustrative scenarios under which the Moroccan authorities' growth and employment objectives in the medium term can be realized.

4. Based on a cross-country econometric analysis, Section D assesses whether the growth acceleration observed in the last few years in Morocco can be accounted for by main empirical determinants of economic growth, such as transitional convergence, cyclical reversion, structural policies, macro stability, and external conditions.

5. Conclusions from the analyses described above as well as policy implications are presented in Section E.

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[1] Principal authors are Jacques Bouhga-Hagbe, Jérôme Vandenbussche (both IMF), José R. López-Cálix (World Bank) and Francisco Gallego (Massachusetts Institute of Technology). Research assistance was provided by Fernanda Sayavedra. The Moroccan authorities kindly provided data for and helpful comments on earlier versions of this chapter.

B. Stylized Trends in Growth

6. **This section documents growth patterns in Morocco since the early 1970s**. Growth has been lackluster and volatile, especially in the 1990s. The most recent years show some encouraging signs, such as a strong decline in the volatility of nonagricultural output, a recovery in investment and private saving as well as an increase in foreign direct investment flows. However, the performance of the economy still needs to improve to catch up with the recent trends of GDP and export growth observed in developing countries.

Overall growth

7. **Morocco's average growth[2] performance since 1971 has been weaker than that of developing countries as a group.**[3] Indeed, over that period of three and a half decades, the real GDP growth differential with this group represented a little more than half a percentage point per annum (see Table 1).

Table 1. GDP Growth, 1971–2004
(In percent)

	Real GDP growth		Real GDP per-capita growth	
	Morocco	Developing countries	Morocco	Developing countries
1971–2004	3.81	4.47	1.75	2.58
1971–1982	4.75	4.74	2.09	2.58
1982–1991	4.32	3.75	2.16	1.80
1991–1998	2.11	4.20	0.42	2.51
1998–2004	3.33	5.35	2.05	3.84

Sources: Moroccan National Accounts; WEO database; and IMF Staff estimates.

8. **A breakdown into four periods[4] reveals that this growth differential is the result of Morocco's low growth since the early 1990s.** Supported by large public investment projects, growth was strong in the 1970s. The growth rate then declined somewhat during the 1980s, but remained above that in the developing world, despite a balance of payments crisis in the first half of that decade. Affected by several severe droughts in a row, the economy's performance then sharply deteriorated during the 1991–

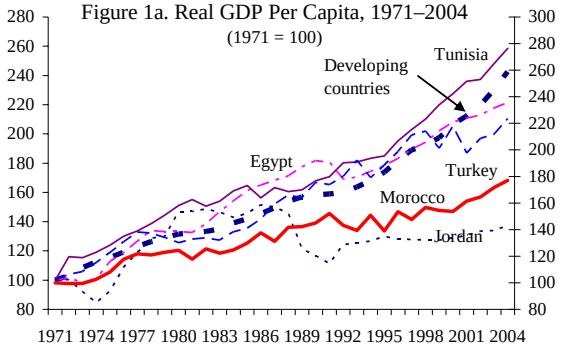
[2] By convention, annual GDP growth over a given period of time represents the geometric average growth rate between the GDP level at the beginning of the period and that at the end of the period.

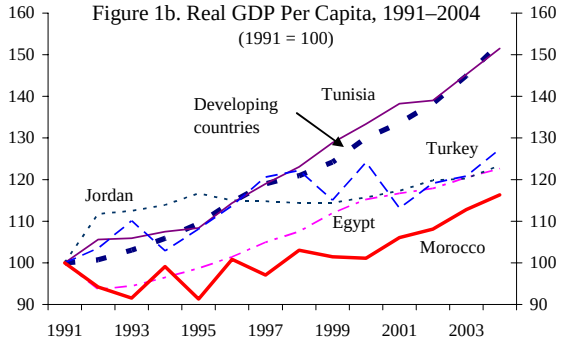
[3] The set of developing economies is taken from the World Economic Outlook database and comprises 152 countries for the whole period 1971–2004. Averages are computed using PPP weights.

[4] These four periods are chosen to ensure consistency across all sections in the chapter and to provide a basis for a meaningful analysis of Morocco's growth performance over time. The first period (1971–82) runs between two population censuses. The other periods run from peak to peak, where the noncensus peak years (1991, 1998 and 2004) are obtained after plotting the path of the log of real GDP between 1970 and 2004 and fitting a polynomial trend line of order three.

98 cycle and the negative differential with the average developing country reached two percentage points per annum. The economy has strengthened since 1998, but the differential has remained. Given the rapid expansion of Morocco's population until recently,[5] its growth performance looks relatively worse in per capita terms since the gap with the average developing country amounted to 0.8 percentage point per annum over the whole period.

9. **Morocco's performance also looks lackluster when compared to other nonoil and politically stable countries in the Middle East and North Africa region.** In terms of GDP per capita growth during 1971–2004 (Figure 1a), Morocco did better than Jordan only, when that country had to absorb inflows of refugees in the early 1970s and early 1990s. Since 1991, Morocco is the weakest performer of the group, although there has been some improvement in the latest cycle as a consequence of an acceleration in GDP growth and a slowdown in population growth (Figure 1b).





Sources: Moroccan National Accounts; WEO database; and IMF staff estimates.

Volatility of growth

10. **The volatility of output has been a constant feature of the Moroccan economy** (see Figure 2a). The path of GDP has been subject to the volatility of the price of phosphate in the 1970s and to the vagaries of rainfalls since the early 1980s. These latter shocks have had a first-order impact on the fluctuations of agricultural production and of total output as a result. Given the negative correlation between volatility and growth observed in cross-country studies (see Ramey and Ramey (1995) for example), a high volatility has serious negative implications for welfare through both its direct and indirect effects.

[5] The growth rate of the population has steadily declined from 2.6 percent in the early 1970s to 1.1 percent in 2004.

Figure 2a. Real GDP Growth Rate
(in percent)

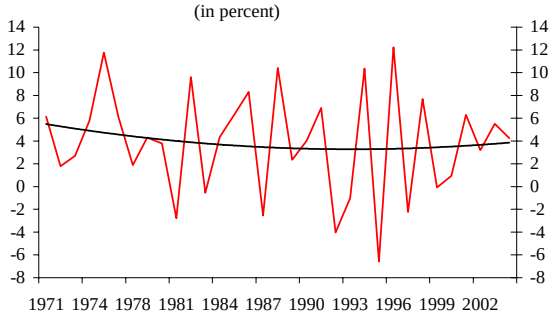
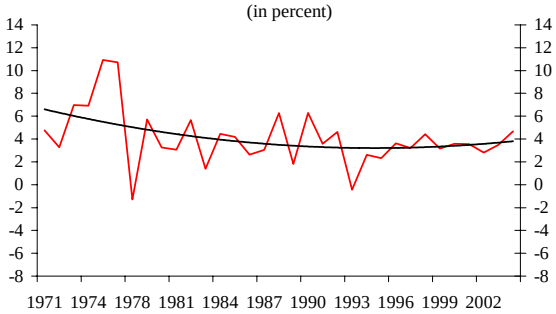


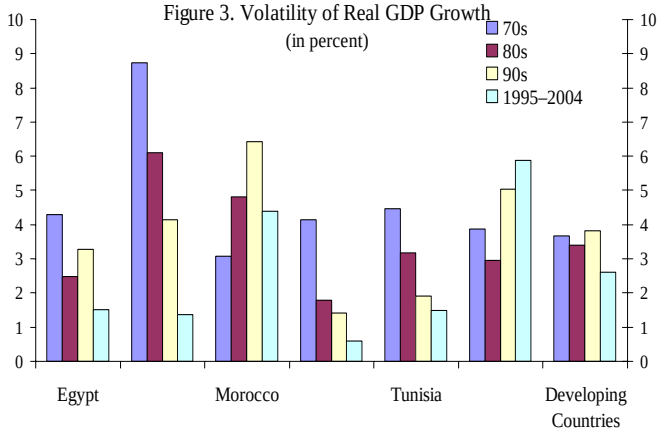
Figure 2b. Nonagricultural Real GDP Growth Rate
(in percent)



Sources: Moroccan National Accounts; and IMF staff estimates.

11. **Nonagricultural GDP growth has also been volatile, although there is clear evidence that this volatility has been on a declining trend and has substantially diminished during the past ten years** (see Figure 2b). The share of cereal production in the total nominal value of primary sector production fell from one third in 1980, the base year used for GDP calculations, to less than one fifth in 2003, while the shares of other less volatile components such as fruit and especially livestock have expanded. This evolution suggests that the direct spillover from the volatility of real agricultural production to that of real nonagricultural output could have declined over time. Moreover, greater stability of food prices has been observed in the last decade and the government has implemented some countercyclical policies in rural areas during the last two droughts (1999 and 2000). The combination of these factors may explain why the impact of real fluctuations in the primary sector on the rest of the economy has become more moderate.

Figure 3. Volatility of Real GDP Growth
(in percent)



Sources: Moroccan National Accounts; and IMF staff estimates.

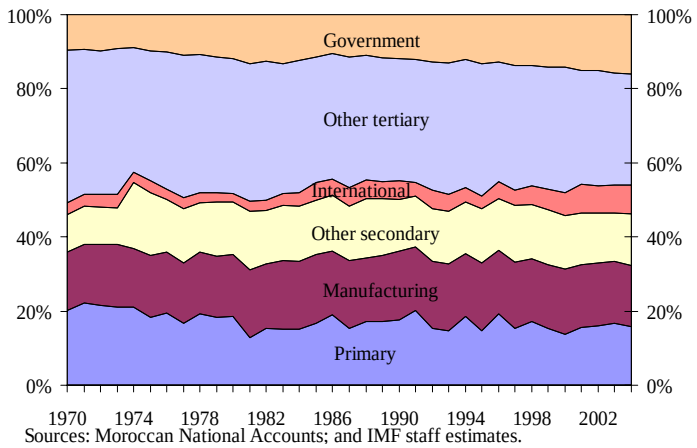
12. **When put in international perspective, the volatility[6] of real GDP growth in Morocco has been higher than that of the average for developing countries since the 1980s**, and among the highest in the group of comparable economies in the region (see Figure 3). However, the volatility of nonagricultural GDP growth over the past ten years looks quite low by international standards.

[6] The volatility of real GDP growth in a decade is defined as the standard deviation of annual growth rates observed during that decade.

The supply side: sectoral composition of growth

13. **The sectoral composition of nominal GDP has not changed substantially over the past twenty-five years** (see Figure 4). The share of the primary sector declined in the 1970s while that of the government sector increased. Since the early 1980s, the primary sector accounts for about 16 percent of total nominal output, with a share fluctuating from year to year, reflecting intermittent droughts and subsequent recoveries as described above.

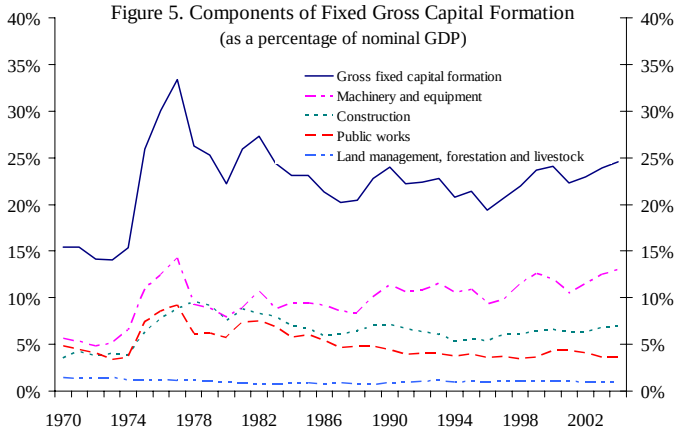
Figure 4. Sectoral Shares in Nominal GDP



Sources: Moroccan National Accounts; and IMF staff estimates.

14. **The share of the industrial sector has not significantly expanded over time.** The adjustment programs in the 1980s aimed at diversifying the tradable goods sector and reducing the share of commodities—subject to exogenous price shocks—in that sector (see Nsouli and others (1995)). The share of mining did indeed decline gradually over time—it now represents 1.6 percent of GDP and has more than halved in twenty years. However the share of the manufacturing sector in total GDP has remained in the same remarkably narrow range as in the earlier period, fluctuating between 16 percent and 19 percent. Within manufacturing, all subsectors grew at approximately the same rate over the period. For a long time, the strongest performer was the export-oriented subsector of textiles and leather, but its growth has slowed markedly since 1995.

Figure 5. Components of Fixed Gross Capital Formation
(as a percentage of nominal GDP)

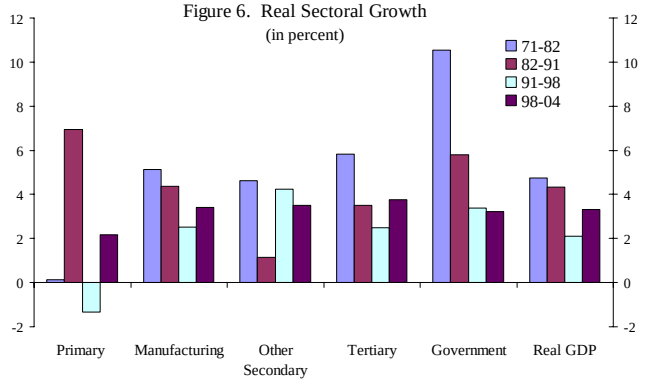


Sources: Moroccan National Accounts; and IMF staff estimates.

15. **Construction and public works grew at a low rate over the period**—the sector even stagnated in real terms between 1975 and 1996. Arguably, this is due to unsustainable rates of public investment in the mid-1970s, but the analysis of the evolution of the components of investment (see Figure 5), in particular public works, suggests that infrastructure may not have expanded fast enough to meet the growing needs of the economy.

16. **The share of the tertiary sector has also remained relatively stable**, around 38 percent of GDP, while the share of international tourism has risen steadily since the early 1980s. National accounts indicate that the most dynamic subsectors have been transportation, communications, and financial intermediation.

Figure 6. Real Sectoral Growth
(in percent)



Sources: Moroccan National Accounts; and IMF staff estimates.

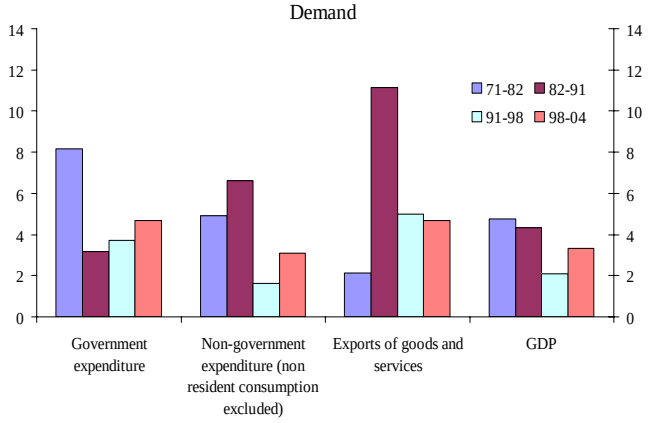
17. **The sectoral composition of real GDP growth seems to have become more balanced over the past cycle**. When analyzing the real growth of each sector through the four periods (Figure 6), it appears that the manufacturing and tertiary sectors have a dynamics which is very close to that of the economy in the aggregate, and that the growth of the government sector has been much stronger than overall growth except in the last period.[7] This cycle is characterized by balanced contributions of all major sectors, and by an acceleration of the growth of the tertiary sector as a result of the dynamism of most of its components.

The demand side: external and domestic factors

18. **The past few years have witnessed a revival of domestic demand**. Strong growth in the 1970s was supported by the spectacular expansion of public expenditure (see Figures 7 and 9). The slowdown of government demand in the 1980s was counteracted by a remarkable (but volatile) expansion of exports of goods and services (see Figure 8) in a context of continuous depreciation of the real effective exchange rate. This rapid expansion came to a halt in 1991 and Morocco has not yet caught up with the high rhythm of export growth observed in the average developing country since 1990. As private domestic demand failed to regain vigor, following several consecutive droughts, the 1990s were a decade of weak growth. The moderate rebound which took place during the last cycle was helped by government demand, nongovernment investment, and an accelerating recovery of resident consumption. The export performance, however, remained tepid. The ongoing process of structural reforms, in particular the recently signed free trade agreements, should help exports regain some strength over the medium term, despite the negative shock to the textiles and clothing sector following the worldwide abolition of quotas on January 1, 2005.

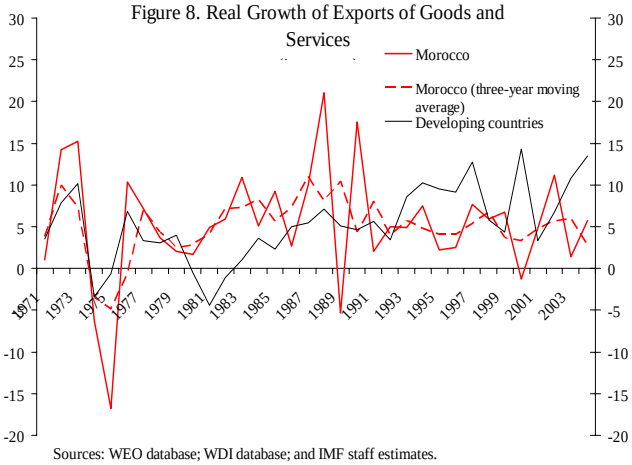
[7] As a result of significant public wage increases the share of government in nominal GDP has expanded over the last period, as shown in Figure 4.

Figure 7. Growth of Components of Real Demand



Sources: Moroccan National Accounts; WDI database; and IMF staff estimates.

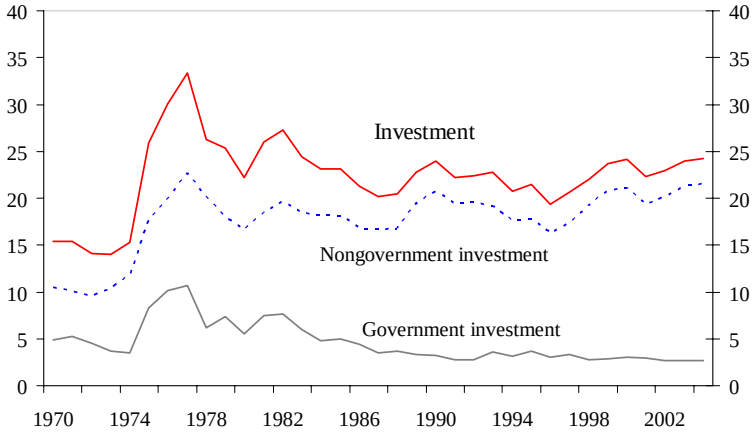
Figure 8. Real Growth of Exports of Goods and Services



Sources: WEO database; WDI database; and IMF staff estimates.

19. **Investment[8] has recently regained vigor**. It peaked in 1976 at above 30 percent of nominal GDP as a result of large government-supported infrastructure projects and then declined gradually until 1996, a year in which it fell below 20 percent of GDP (see Figure 9). It has recovered slightly since then and stood at 24.6 percent in 2004. Since the peak of the mid-1970s, a radical shift has occurred in the composition of investment as general government investment fell steadily from 11 percent to 2.4 percent over the past thirty years. At the same time, the share accounted for by the nongovernment sector[9] fluctuated around a slightly upward trend.[10]

Figure 9. Government and Nongovernment Investment
(in percent of nominal GDP)

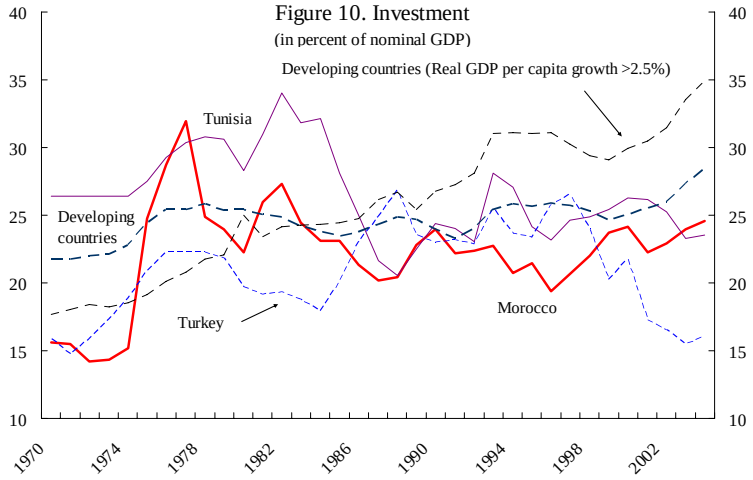


Sources: Moroccan Authorities; and IMF staff estimates.

[8] In this paragraph and the next, investment is defined as gross fixed capital formation and therefore excludes stockbuilding.

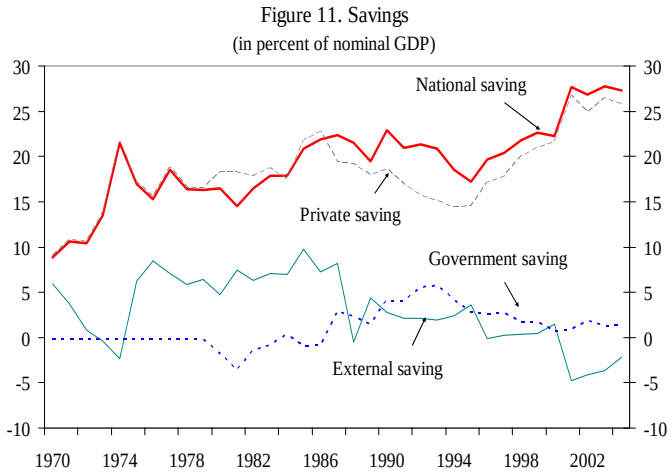
[9] The nongovernment sector includes public enterprises.

[10] Data available for 2001–04 show that investment by public and semi-public companies have supported the improvement over the past cycle.



Sources: Moroccan National Accounts; WEO database; and IMF staff estimates.

20. A cross-country comparison of investment to nominal GDP ratios (see Figure 10) reveals that Morocco has fallen behind the average developing country since the mid-1980s and has invested on average about 4 percent of GDP less than Tunisia—the best performer in the region—since 1970. However, this gap has disappeared in the past two years. Limited data availability and comparability on central government investment in many developing countries unfortunately preclude a complete cross-country comparison of nongovernment investment.

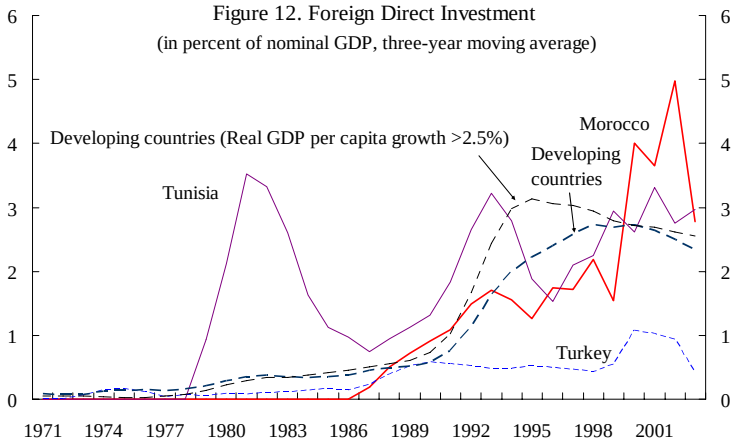


Sources: Moroccan Authorities; and IMF staff estimates.

21. **Supported by strong remittances flows, national savings have also recently picked up**. An important goal of the adjustment strategy at the end of the 1980s was to improve the overall savings performance, so as to reduce reliance on foreign savings. One can see on Figure 11 that this objective has been achieved only lately. Indeed national savings actually fell in the first part of the 1990s and bottomed at 17.3 percent of GDP in 1995. They have been recovering gradually since then, helped by strong inflows of remittances over the past few years. National savings stood at 27.3 percent of GDP in 2004.

22. **Reflecting these movements, the overall national savings-investment gap, which persisted above 5 percent of GDP until 1987 narrowed in a series of three steps**, falling first to an average of 2.5 percent in the first half of the 1990s to almost zero in the second half, and then actually transformed into a significant surplus since 2001, an indication that there is currently room to increase investment.

Foreign direct investment



Sources: Moroccan authorities; IFS database; and IMF staff estimates.

23. **Morocco's attractiveness to foreign direct investment has gradually increased over the past twenty years.** Following a period of restrictions on foreign ownership which lasted from the mid-1970s to the early 1980s, Morocco has attracted more and more foreign direct investment to reach a level of 1.55 percent of GDP on average in the 1990s. Large privatization deals have made FDI flows look abundant in the past few years and have enabled Morocco to overtake the average developing country and even the fastest growing countries of that group. Excluding privatization receipts, annual FDI flows amounted to US660 million on average during 2000–04, equivalent to 1.7 percent of GDP and 7.2 percent of total investment.

C. Sources of Long-Term Growth: Estimates for Underlying Growth

24. **This section analyzes the contributions of capital, labor and total factor productivity to the long-term growth of Morocco's output.** It is found that over the past thirty-five years, most of Morocco's growth performance can be attributed to factor accumulation, and that total factor productivity has not significantly contributed to the overall growth of the economy. However, the contribution of total factor productivity to the growth of the nonagricultural sector has significantly improved in the most recent period analyzed.

Growth accounting methodology

25. **The following analysis of the long-term growth of Morocco's output uses the growth accounting methodology.** This technique decomposes the growth of output over a certain period into the contribution of capital, labor, and a residual, which is interpreted as the contribution of total factor productivity growth. This growth decomposition is done for the whole period 1971–2004 and four subperiods,[11] both for the whole economy and the nonagricultural sector.[12] Restricting the growth accounting to the nonagricultural

[11] These subperiods are the same as those analyzed in Section B.

[12] The nonagricultural sector includes all sectors of the economy except agriculture, forestry and fishing which together represent 17 percent of real GDP on average over the period.

sector makes it possible to strip out most of the impact of the year-to-year volatility of cereal output. Data sources are presented in Appendix I.

26. Before computing the contributions of each factor and of the residual, an aggregate production function is empirically estimated. It is assumed that the production process can be modeled with a Cobb-Douglas function. That is if Y_t, K_t, L_t, and A_t are respectively output, capital, employment and total factor productivity in period t, the production process can be represented by the following equation:

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha} \qquad (1)$$

where α is the elasticity of output to capital. For lack of data, the production function of the nonagricultural sector cannot be estimated. The elasticity of output to capital is therefore assumed to be identical in the nonagricultural sector and the whole economy.

After taking logarithms on both sides, equation (1) is then transformed into the following equation:

$$Ln\left(\frac{Y_t}{L_t}\right) = a + gt + \alpha\, Ln\left(\frac{K_t}{L_t}\right) + \varepsilon_t \qquad (2)$$

which is the one that is estimated.[13] The coefficients a and g are constants and ε_t is an error term.

Using the fact that for any variable X_t, $Ln(X_t) - Ln(X_{t-1})$ is "approximately" the growth rate $\frac{X_t - X_{t-1}}{X_{t-1}}$ of the variable X_t, equation (1) is used to decompose the growth rate of output $\frac{Y_t - Y_{t-1}}{Y_{t-1}}$ into the growth rate of total factor productivity $\frac{A_t - A_{t-1}}{A_{t-1}}$, the growth rate of capital $\frac{K_t - K_{t-1}}{K_{t-1}}$, and the growth rate of employment $\frac{L_t - L_{t-1}}{L_{t-1}}$. It then follows that

$$\left(\frac{Y_t - Y_{t-1}}{Y_{t-1}}\right) = \left(\frac{A_t - A_{t-1}}{A_{t-1}}\right) + \alpha\left(\frac{K_t - K_{t-1}}{K_{t-1}}\right) + (1-\alpha)\left(\frac{L_t - L_{t-1}}{L_{t-1}}\right) \qquad (3)$$

[13] The details of the derivation are in Appendix I.

Equation (3) is the "growth accounting framework" that is used in this analysis. The growth rate of total factor productivity $\frac{A_t - A_{t-1}}{A_{t-1}}$ is interpreted as the contribution of total factor productivity to output growth, the term $\alpha\left(\frac{K_t - K_{t-1}}{K_{t-1}}\right)$ as the contribution of capital to output growth, and the term $(1-\alpha)\left(\frac{L_t - L_{t-1}}{L_{t-1}}\right)$ as the contribution of labor to output growth.

27. **The above-described growth accounting framework has obvious shortcomings**. First, "productivity" is a residual, and not a direct estimation of an improvement in the quality or performance of production factors. Second, this residual is affected by uncertainties related to the measurement of production factors and output. An error in the estimation of capital stock or labor can significantly change the magnitude of productivity growth. Third, it does not isolate the main factors that have contributed to productivity growth. There is no way to identify whether the improvement of productivity came from the quality of the capital stock, the quality of the human capital stock, or from the managerial or organizational skills of firms. Fourth, the share of each production factor is assumed to be constant throughout the period under consideration. This may not be the case for developing countries that typically tend to move from labor-intensive to capital-intensive activities over time.

28. **In spite of the aforementioned shortcomings, the relevance of the growth accounting methodology cannot be ignored**. As a first step, it helps to orient the analysis of an economy's growth by trying to isolate, though in a relatively imprecise way, the contribution of factor accumulation and that of an improvement in the quality of these factors. Such an analysis must be complemented with other information on the historical evolution of such factors during the period under consideration.

Application to Morocco

29. **Estimates of the production function for Morocco suggest that the growth rate of total factor productivity has been very modest on average.** The long-run growth rate of productivity *g* and the elasticity of output to capital α are estimated for the Moroccan economy using equation (2).[14] The results of the estimation are presented in Table 2 and are in line with a priori expectations.[15] The estimated elasticity of output to

[14] It is assumed that the error term ε_t is stationary. The estimation is done in levels using cointegration techniques on a dataset covering the period 1960–2002. The Vector Error Correction Model (VECM) that was initially estimated used 7 lags. Only the first lag in this estimated VECM turned out to be significant. So we estimated another VECM using only one lag.

[15] Further details on the econometric techniques and tables are presented in Appendix I.

capital (α) is about 0.4. The point estimate of the annual growth rate or productivity g is not statistically significant. This suggests that over the estimation period, productivity growth in Morocco has been nil on average.

Table 2. Estimation of the Production Function

GDP/ Labor force	Johansen		Fully Modified OLS
	Model with 7 lags	Model with 1 Lag	
Capital/Labor force	0.53	0.35	0.43
	[6.55]	[3.53]	[6.26]
Trend	-0.0047	0.0036	0.0025
	[- 1.59]	[1.09]	[1.16]

1/ t-statistics are in brackets. The sample covers the period 1960–2002. All equations include an unreported constant term

30. **The results of the growth accounting analysis indicate that GDP growth was essentially driven by factor accumulation over the past thirty-five years (see Table 3)**.[16] The results of the growth accounting are broadly in line with the stylized trends presented in Section B. Growth in Morocco is mostly driven by factor accumulation and the contribution of total factor productivity is on average negligible. Capital accumulation was the main factor contributing to growth in the 1970s. Since the 1980s the contributions of capital and labor to growth were more or less the same. The contribution of productivity is negative for all the periods considered except during 1982–91. The negative contribution of total factor productivity to growth during some of the periods considered is partly due to the performance of the agricultural sector, which depends on weather conditions.

Table 3. Growth Decomposition for the Whole Economy
(In percent)

	1971–2004	1971–1982	1982–1991	1991–1998	1998–2004
Real GDP	3.83	4.81	4.32	2.11	3.33
Contribution of capital	2.16	3.47	1.47	1.17	2.02
Contribution of labor	1.64	1.86	1.54	1.48	1.57
contribution of TFP (as a residual)	0.03	-0.51	1.32	-0.54	-0.25

Source: IMF staff estimates.

31. **However, the growth accounting exercise for the nonagricultural sector reveals that while the growth of the residual has also been close to zero on average**

[16] The growth accounting exercise uses the estimated elasticity of output to capital of 0.4. One should note that some authors do not estimate this elasticity, but rather assume a value usually between 0.3 and 0.4 to perform their growth accounting exercise. For example, Bosworth and Collins (2003) assume that the value of this elasticity is 0.35.

over the whole period 1971–2004, its contribution has gradually improved over time in parallel with a declining contribution of labor (Table 4). Nonagricultural growth in the 1970s was impressive but relied both on unsustainable rates of capital accumulation and a strong expansion of employment. The residual was negative, maybe because the returns to public investment in infrastructure were rather low or did not materialize in the short-run. Nonagricultural growth slowed down sharply in the 1980s but the negative contribution of the residual was smaller. One possible explanation is that, following the investment boom of the previous decade, capacity utilization improved and employers became more selective in their hiring decisions. Consistent with this last hypothesis, employment growth slowed down by more than one percentage point per year during that period and urban unemployment shot up from 12.7 percent in 1982 to 17.3 percent in 1991. The 1991–98 cycle was characterized by several droughts and negative contribution of the residual in aggregate growth as described above, but the residual in the nonagricultural sector actually stabilized. Capital accumulation remained weak, while employment growth continued to decline in a context of increasing urban unemployment and a declining participation rate. More recently during the 1998–2004 cycle, investment picked up but the contribution of employment dropped further. The contribution of the residual in nonagricultural growth reached a significantly positive level for the first time in thirty-five years, indicating that structural reforms may have started to enhance total factor productivity. These productivity improvements, however, seem to have taken place at the expense of employment growth in the short run.

Table 4. Morocco: Growth Decomposition for the Nonagricultural Sector
(In percent)

	1971–2004	1971–82	1982–91	1991–98	1998–2004
Real Non Agricultural GDP	4.29	6.06	3.35	2.90	3.55
Contribution of capital	2.15	3.68	1.23	1.19	1.70
Contribution of labor	2.50	3.71	2.39	1.66	1.05
Contribution of TFP (residual)	-0.36	-1.33	-0.27	0.05	0.80

Source: Moroccan authorities; *Annuaires Statistiques;* and IMF staff estimates.

The role of total factor productivity in increasing employment

32. **This subsection contrasts scenarios relying on high investment levels with others relying on high total factor productivity growth to reduce unemployment to some targeted level and reach a GDP growth rate of 5 percent per year**. All scenarios embed the objective of reducing the unemployment rate by half in ten years, from 10.8 percent in 2004 to 5.4 percent in 2014. Assuming an annual growth rate of the labor force of 2.5 percent over the period, consistent with the trend since the 1990s,

employment will have to grow at an annual rate of 3.1 percent in order for Morocco to reach the targeted unemployment level in 2014. The resulting growth rate of real wages would be 1.9 percent per annum. The Moroccan authorities envisage a minimum growth rate of output of 5 percent a year. Three scenarios for achieving this output growth rate are examined (Table 5).

33. The first scenario assumes that capital stock would grow at 4 percent per annum, in line with the average growth rate since 1990. Under this scenario total factor productivity will have to grow at a minimum rate of 1.5 percent a year in order to reach the output growth target, compared with a total factor productivity contribution of 0.8 percent to the nonagricultural GDP growth during 1998–2004.

34. The second scenario assumes that capital stock grows in line with GDP at the rate of 5 percent, thus maintaining the investment rate stable at the current level of 25 percent of GDP throughout the ten-year period. In order to reach the output growth target under this scenario, total factor productivity will have to grow at a minimum rate of 1.1 percent a year.

35. The third scenario assumes that productivity grows at 0.8 percent per year, the average growth rate of productivity in the nonagricultural sector for the period 1998–2004. In order to achieve the desired output growth rate, the capital stock will have to grow at the rate of 5.8 percent per year, raising the investment rate from 25 percent in 2004 to 27 percent in 2014.

36. While these scenarios are indicative, the findings highlight that reforms in the future would need to aim at fostering both productivity gains and higher investment as the basis for higher growth and employment.

Table 5. Employment Scenarios, 2004–14

Targeted growth rate of employment (in percent) 1/	3.1
Output growth rate (in percent) 2/	5.0
Scenario I: Capital stock grows at the average rate since 1990	
Growth rate of capital stock assumed (in percent)	4.0
Investment rate in 2014 (in percent of GDP)	22.1
Contribution of the growth of capital stock to output growth	1.6
Contribution of the growth of employment to output growth	1.9
Contribution of the growth of productivity to output growth	1.5
Scenario II: Capital stock grows in line with GDP	
Growth rate of capital stock assumed (in percent)	5.0
Investment rate in 2014 (in percent of GDP)	25.0
Contribution of the growth of capital stock to output growth	2.0
Contribution of the growth of employment to output growth	1.9
Contribution of the growth of productivity to output growth	1.14
Scenario III: Total factor productivity grows at the average growth rate of nonagricultural total factor productivity in 1998–2004	
Growth rate of total factor productivity assumed (in percent)	0.80
Growth rate of capital stock (in percent)	5.8
Investment rate in 2014 (in percent of GDP)	27.1
Contribution of the growth of capital stock to output growth	2.3
Contribution of the growth of employment to output growth	1.9
Contribution of the growth of productivity to output growth	0.80

Source: IMF Staff estimates.

D. The Role of Macroeconomic Stability and Structural Reforms as Determinants of Morocco's Growth Performance

37. **This section applies the cross country regression model presented in Loayza and others (2005) to study the growth performance of Morocco.**[17] The evolution of the variables included in the model explains a significant portion of the observed increase in per capita GDP growth of 1.49 percent per annum on average between the cycles 1991–98 and 1998–2004.[18] In particular, this acceleration is associated with improvements in macroeconomic stability and structural reforms.

[17] Since the analysis is based on cross country regressions, GDP is in 1985 PPP-adjusted US dollars. Hence growth rates in Section D do not exactly match those in Sections II and III for identical periods. Deviations between the two growth series, however, are minimal.

[18] Growth of GDP per capita—in 1985 PPP-adjusted dollars—accelerated from an annual average of 0.26 percent during 1991–98 to an annual average of 1.75 percent during 1998–2004.

Cross-country regressions

38. **Loayza and others (2005) use cross-country regressions in the spirit of Barro and Lee (1994), which link the per capita GDP growth performance of a country to a group of economic, social, and political variables, in order to construct growth explanations**. They identify a robust statistical relationship between a group of variables and per capita GDP growth in a sample of 78 countries[19] during the period 1961–99. They classify the growth determinants in five subgroups of variables associated with transitional convergence, cyclical reversion, structural policies and institutions, stabilization policies, and external conditions. Using the estimated coefficients of these growth determinants, it is possible to decompose the growth performance of a particular country.

39. Loayza and others' (2005) econometric specification is fairly parsimonious and can be represented by the following equation:

$$\frac{y_{it} - y_{it-5}}{5} = \lambda y_{it-5} + \alpha^C y^C_{it-5} + \beta' X^I_{it} + + \gamma' X^S_{it} + \delta T_{it} + \mu_t + \eta_i + \varepsilon_{it} \qquad (4)$$

where y is log per capita GDP, y^C is output gap (the logarithmic difference between actual and trend output), X^I is a set of structural policies and institutions, X^S is a set of stabilization policies, T is terms-of-trade growth, μ_t is a time dummy, μ_i is an unobserved country fixed effect, ε_i is the regression residual, and λ, α^C, β, γ, δ are parameters to be estimated. The subscript i refers to a country and t to time period. Details on the definition, construction, and sources of these variables and the econometric technique used are presented in Appendix II.[20]

40. The set of explanatory variables in the regression equation (4) can be classified as:

- *Transitional convergence*: One of the main implications of the neoclassical growth model is that an economy's growth rate depends on its original position and that richer countries tend to grow more slowly than poorer countries, after controlling for other determinants of growth (Barro and Sala-i-Martin (1995) and Turnovsky (2002)). This effect is captured by the parameter λ, which should be negative.

- *Cyclical reversion*: Countries growing faster than their trend tend to slow down in the future. This effect is captured in equation (4) by the parameter α^C, which should be negative.

[19] The sample consists of 78 countries, covers all continents and includes Morocco (see Appendix C in Loayza and others (2005)).

[20] For the determinants of growth, actual values are used until 2002, 2003 or 2004, depending on the availability of the series.

- *Structural policies and institutions*: A vast literature supports the claim that structural policies should have an impact on per capita growth. For example, Lucas (1988) emphasizes the importance of human capital, Beck and others (2000) that of financial development, and Pritchett (1996) that of international trade. Regarding the role of government expenditures, Corden (1991) analyzes the impact of their size, while Barro and Sala-i-Martin (1992) examine the effect of public services and infrastructure. Finally, Kauffman, Kraay and Lobaton (1999) explore the relationship between several governance indicators and growth. Therefore, the set of policies included in the regression contains: education (which should have a positive effect on growth), financial depth (positive effect), international trade openness (positive effect), governance (positive effect), government burden (negative effect), and public services and infrastructure (positive effect). These effects are captured in equation (4) by the β vector.

- *Stabilization policies:* Stabilization policies are also expected to have a positive impact on growth as argued by Fisher (1993). The following variables are therefore included in the regression: lack of price stability (negative effect), cyclical volatility (negative effect), real effective exchange rate level[21] (negative effect), and financial crises (negative effect). These effects are captured in equation (4) by the γ vector.

- *External conditions*: The two included variables are related to global conditions and the evolution of terms of trade. Their effects are captured in equation (4) by the coefficients μ_t and δ.

41. The results of the estimation of the cross country regression are presented in Table 14[22] in Appendix II. They are obtained using econometric techniques that deal with the problems of both a country-specific fixed-effect in a dynamic structure and the potential endogeneity of the explanatory variables.[23] All the estimated parameters have the correct sign and are statistically significant, except for the case of governance, which is negative and insignificant.[24] Therefore, the coefficient for this variable should be interpreted with caution, as these results mean that the effect of governance on economic

[21] The level of the real effective exchange rate is adjusted such that the average for 1976–85 equals the index of real exchange rate distortion reported in Dollar (1992), which is 123 for Morocco during 1976–85. Using Dollar's methodology, a country without any distortion would have an index of 100 for 1976–85.

[22] Only results for the basic equation estimated in Loayza and others (2005), which contains additional estimates and robustness checks, are presented.

[23] More specifically, an Arellano and Bond (1991) Generalized Method of Moments (GMM) estimator is used as explained in Appendix II.

[24] Loayza and others (2005) find that this result is robust to alternative indicators of governance. It is also consistent with Dollar and Kraay (2003) who find that various measures of governance have a relatively weak effect on growth, particularly over the medium-term horizon.

growth might rather work through the policies that the Government implements.[25] Results also reflect the deterioration of world growth conditions which has taken place since the end of the 1970s, as reflected by the increasingly negative coefficients of the time dummies.

42. When interpreting the results of the regression, one should bear in mind that cross-country regressions have one main shortcoming. By lumping countries at different stages of development, they ignore the possibility that the impact of policies could differ in various countries depending on their level of development. For example, because returns to production factors are potentially higher in poor countries than in richer ones, the effects on growth of a policy that increases the size of a country's educated labor force could be much higher in a poor country than in a richer one. The same argument applies, for example, to a policy that favors the building of infrastructure.

Growth determinants for Morocco

43. **Overall, Morocco has made progress in most policy dimensions. A set of charts in Figure 13** summarizes the evolution of the right-hand-side variables of equation (4) for Morocco and the world median during 1971–2004.[26] These graphs present an interesting picture of changes in the Moroccan economy over the last thirty-five years:

- *Transitional convergence*: The graph shows a slow increase in GDP per capita, which reflects a lackluster growth performance.

- *Cyclical reversion*: The graph shows that the two most recent quinquennial periods have benefited from the cyclical recovery associated with large and negative output gaps in 1995 and 2000.[27]

- *Structural policies and institutions*: Both the absolute and relative evolution of these variables are of interest:

  - The evolution of *secondary enrollment* and *public infrastructure* clearly shows an absolute improvement since 1971, but a worsening in relative terms. Putting it

[25] Caution is also required because Kauffman, Kraay and Lobaton (1999) find a positive association between governance indicators and growth performance.

[26] Countries included in the empirical analyses in Loayza and others (2005) are used to compute the world median. The median, and not the mean, is used to take account of the outliers problem. The figures present the evolution of the variables at a quinquennial frequency, as in their paper.

[27] This observation deserves a caveat since the Moroccan economy is typically subject to supply-side rather than demand-side shocks. Therefore the 'output gap' should be interpreted with that characteristic in mind.

differently, Morocco is improving both indicators, but lagging behind the World in both areas.[28]

- Other variables such as *trade openness* and *financial depth* show a significant improvement since 1991 and put Morocco above the median value for these variables. The case of *trade openness* is worth noting because, despite the country's improvements in this area, the structure-adjusted trade volume[29] indicates that in relative terms, Morocco's position has worsened in the period analyzed (trade openness was around 15 percent above the world median in the 1970s and it is roughly on the world median during 2001–04), but the 2000s show a takeoff of openness that may further benefit from recent trade reforms and trade agreements.
- The evolution of the *government burden* shows no large differences with the world median. However, it worsens with the deterioration of the fiscal situation in the last period.

- *Stabilization policies:* Price stability shows a small positive difference with the world median and a consolidation of the inflation rate around an average of two percent since the mid-1990s. In Morocco, cyclical volatility is associated with weather conditions and drops below the world median in the last period (due to improved weather conditions). In addition, the real exchange rate has been on a declining path. Finally, Morocco suffered from a financial crisis in the early 1980s.[30]

- *External conditions:* The data show a slight improvement of the terms of trade since the mid-1980s followed by a significant deterioration in the last period.

[28] Note that main telephone lines are a proxy for public infrastructure, as discussed in Loayza and others (2005). Alternative proxies for public infrastructure are energy generation capacity (for example, megawatts of electricity produced per capita), transport facilities (for example, kilometers of paved roads per capita), and main telephone lines plus mobile phone subscribers. This last point is important because including mobile phone subscribers, a significant increase is observed in the 2000s. However, most results are basically unaffected if a composite index of public infrastructure is used, as suggested by Calderón and Servén (2004).

[29] As explained in Appendix II, the measure of trade openness is a structure-adjusted trade intensity index. It is estimated as the ratio of real exports and imports to GDP adjusted for some country-specific structural characteristics such as size (both area and population) of the country, per capita GDP, transportation costs (whether the country is landlocked), and resources endowment (whether it is an oil exporter). For further details, see Pritchett (1996).

[30] Morocco suffered from a balance of payment crisis between 1980 and 1983, with a current account deficit that reached more than 12 percent of GDP and foreign exchange reserves covering less than a week of imports at the height of the crisis.

Figure 13. Growth Determinants, 1971–2004

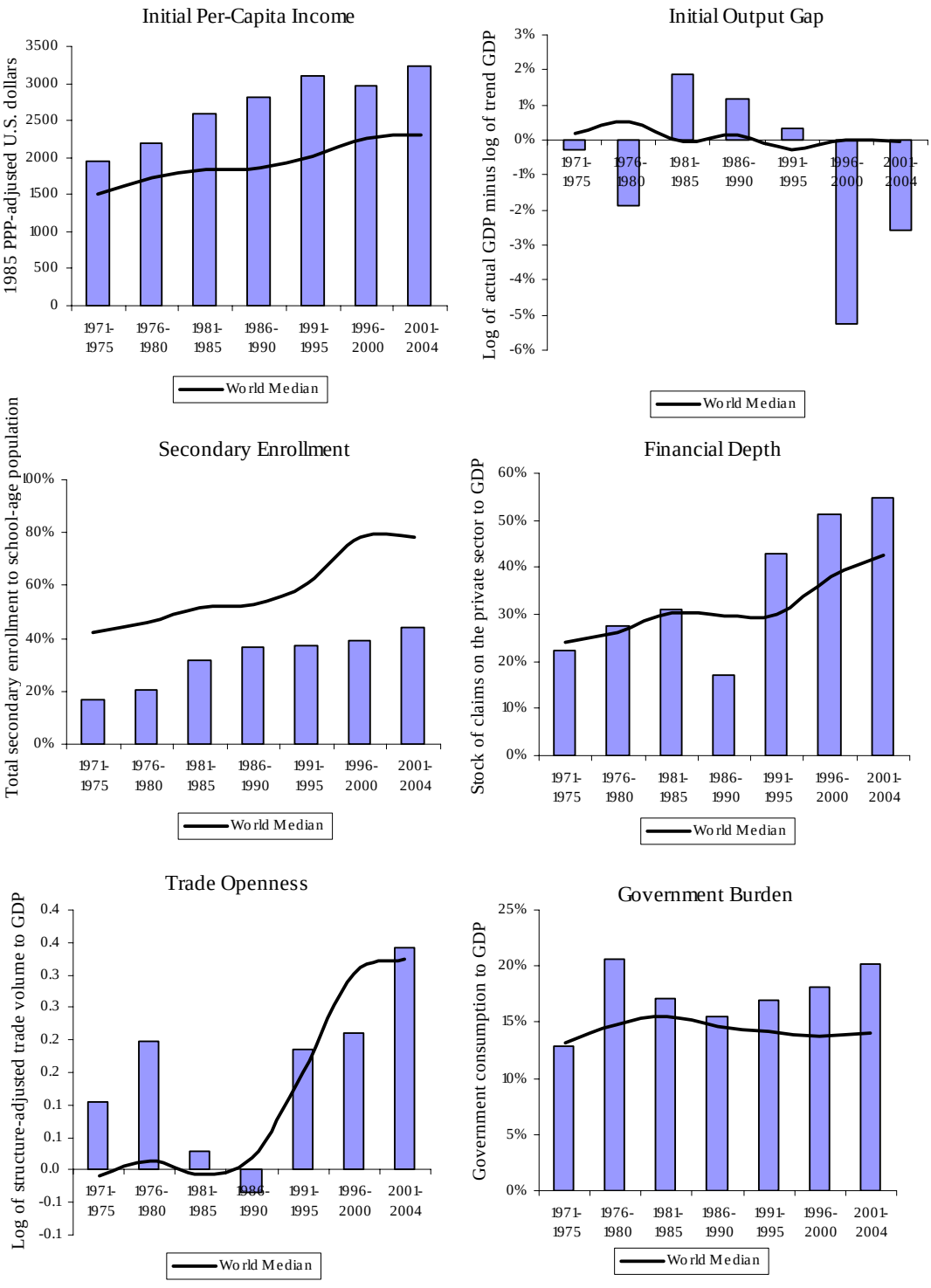
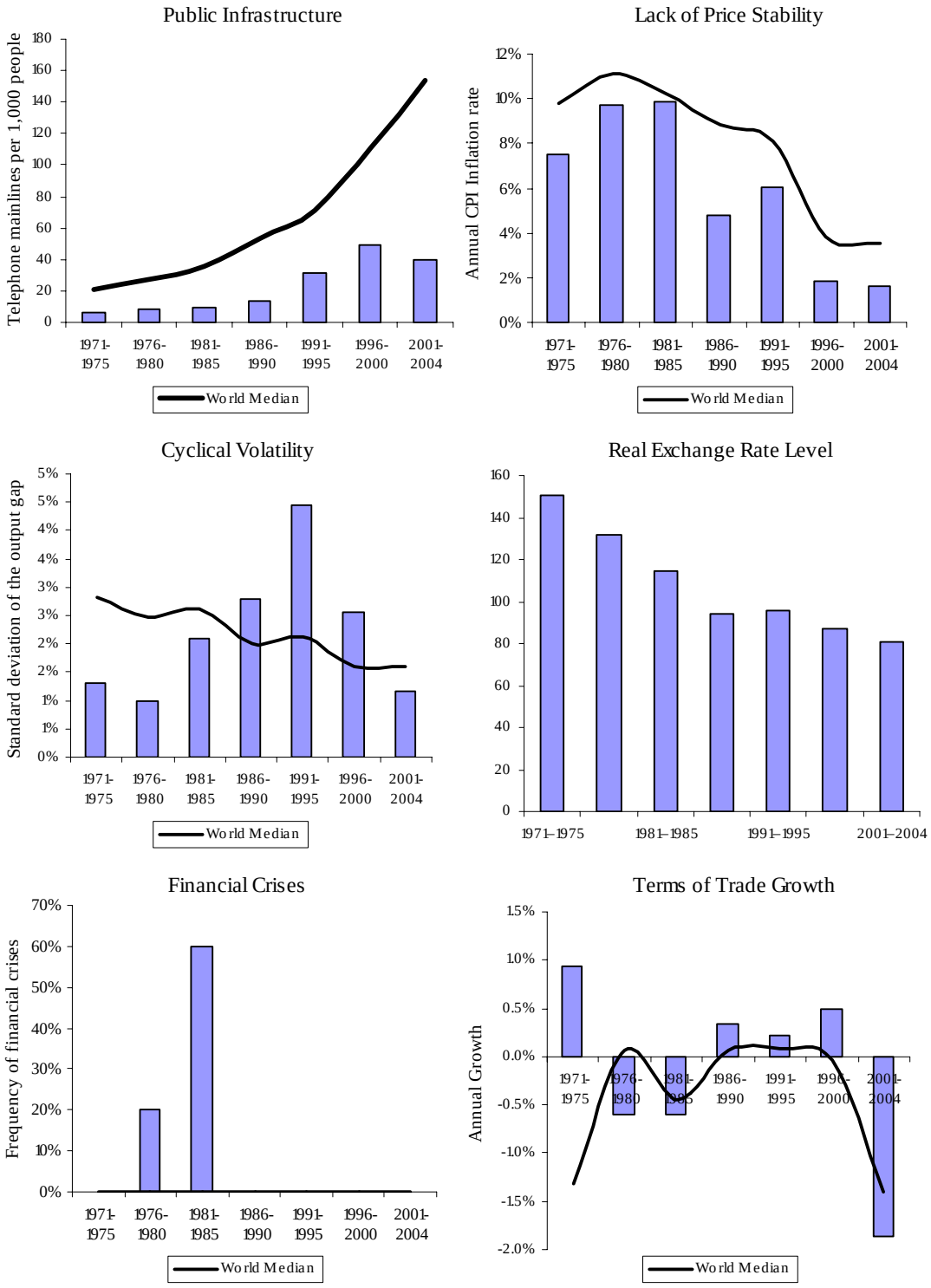


Figure 13. Growth Determinants, 1971–2004 (concluded)



44. **The empirical analysis suggests that the above-described variables could shed light on the Moroccan growth performance**. The estimated coefficients and the actual values of the variables are used to account for the changes in the growth performance across different periods. From the estimated regression equation (4), it is possible to compute the expected change in Morocco's annual growth rate between two periods (see Appendix II for details on the estimation procedure).[31] Table 6 summarizes the contributions of each category of the explanatory variables to the changes in per capita growth rates during the four periods analyzed in this chapter.[32]

Table 6. Changes in Annual Average Per Capita Growth Between Periods

	Actual Change	Expected Change	Transitional Convergence	Cyclical Reversion	Structural Policies	Stabilization Policies	External Conditions
Periods							
1971–82	-0.36	-0.93	-0.29	-0.03	1.07	-0.49	-1.19
1982–91	-0.08	0.03	-0.47	-0.09	1.09	0.49	-0.99
1991–98	-2.09	0.20	-0.37	-0.56	1.37	0.07	-0.31
1998–2004	1.49	1.16	-0.03	0.45	0.39	0.79	-0.44

Source: Gallego (2005).

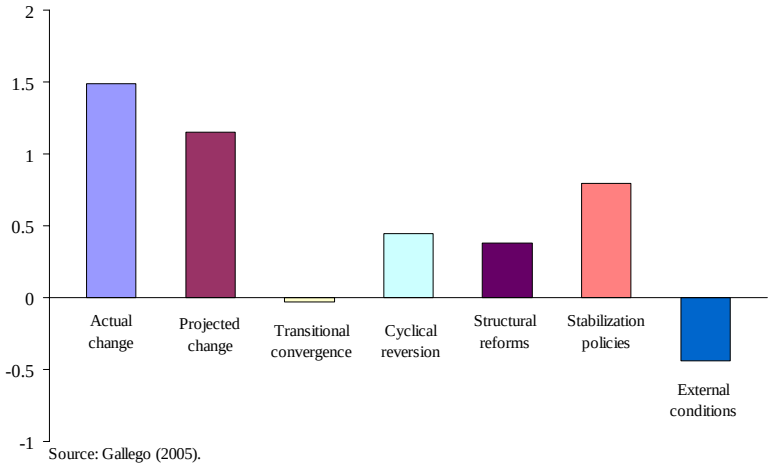
45. **A significant share of the acceleration of the annual average per capita GDP growth rate during 1998–2004 can be explained by the evolution of the variables included in the model (Table 6 and Figure 14).** The model projected an increase of 1.16 percent during 1998–2004.[33] This projected increase is explained by improvement in structural policies (0.39 percent), macroeconomic stability (0.79 percent), and cyclical reversion (0.45 percent), in a period with a negative impact of external conditions (-0.44 percent) and with a small adverse transitional convergence effect (-0.03 percent).

[31] See Appendix II for details.

[32] The model's ability to predict the changes in per capita growth is mixed in some cycles, especially in the period 1991–98 when the actual growth declined rather than increased, and in the period 1971–82 where the expected decline is larger than the actual decline. In the other two cycles, the actual changes are close to the model's predictions. Results take into account, but do not show, the effect of the time dummies.

[33] For the determinants of growth, actual values are used until 2002, 2003 or 2004, depending on the available series.

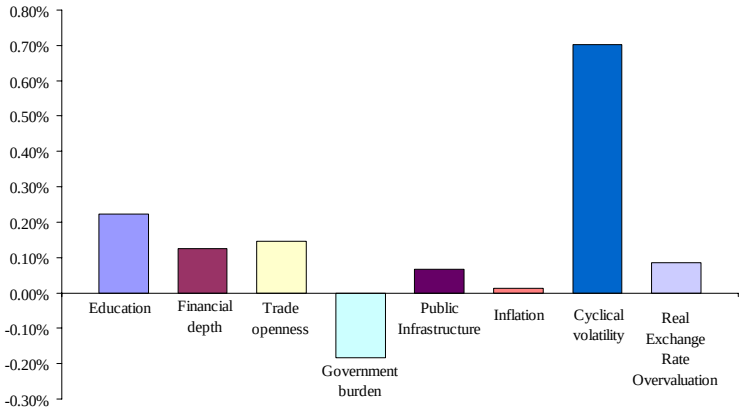
Figure 14. Explaining Changes in Per-Capita Growth
1998–2004 vs. 1991–98



Source: Gallego (2005).

46. **In addition, the contribution of structural and stabilization policies to per capita growth during the 1998–2004 period is associated with a significant decrease in cyclical volatility (Figure 15, Table 7).** The positive effect of structural policies on growth mainly comes from education, trade openness, and financial depth. The total improvement in structural policies is diminished by the negative contribution of the increase in government burden (a factor related to the increased wage payroll during the latest period). The drop in cyclical volatility seems to be mainly related to improved weather conditions during the 1998–2004 cycle.

Figure 15. Changes in Per-Capita Growth Due to Structural
Reforms and Stabilization Policies: 1998–2004 vs. 1991–98



Source: Gallego (2005).

47. **Therefore, the analysis suggests that Morocco would benefit from maintaining macroeconomic stability and further accelerating the implementation of structural reforms**. Improvements in structural and stabilization policies seem to have contributed positively to the modest growth increase in the last cycle with a magnitude which is consistent with cross-country empirical estimates. According to these estimates,

sustained improvements of indicators in the domains of secondary education, trade openness, financial depth and public infrastructure have a large potential to accelerate growth. These policies are essential to achieve the authorities' growth rate objectives in the medium-term.

Table 7. Expected Contributions to Annual Average Growth Changes Between Periods
(In percent)

	Periods				Average	World median average
	1971–82	1982–91	1991–98	1998–2004		
Education	0.98	0.80	0.11	0.22	0.53	0.51
Financial depth	0.29	-0.05	0.42	0.13	0.20	0.21
Trade openness	0.11	-0.16	0.20	0.15	0.07	0.13
Government burden	-0.53	0.17	-0.16	-0.18	-0.18	-0.17
Public infrastructure	0.22	0.34	0.80	0.07	0.36	0.28
Inflation	-0.04	0.01	0.01	0.01	0.00	0.01
Cyclical volatility	0.27	-0.19	-0.24	0.70	0.14	0.04
Real exchange rate overvaluation	0.06	0.20	-0.02	0.08	0.08	0.07
Systemic banking crises	-0.79	0.47	0.32	0.00	0.00	0.00

Source: Gallego (2005).

E. Conclusions

48. This chapter has analyzed Morocco's growth performance over the past thirty-five years using three complementary methodologies. Several conclusions emerge from the exercise.

49. **The first conclusion is that total factor productivity growth has not contributed to overall growth in Morocco neither over the past thirty-five years nor over the last cycle** (1998–2004). Hence, there is room for significant productivity improvements. The finding that total factor productivity growth in the nonagricultural sector has been on an upward trend and has reached a positive level over the past cycle suggests that structural reforms may have started to have an impact.

50. **The second conclusion is that reaching the authorities' GDP growth objective of at least 5 percent in the medium term from its current level of around 3.5 percent will require a further increase in the contribution of capital and total factor productivity to growth**. As a consequence, reforms in the future would need to aim at fostering both productivity gains and higher investment, including in the domain of infrastructures, as the basis for GDP and employment growth

51. **The third conclusion is that recent improvements in structural and stabilization policies seem to have yielded a modest growth increase in the last cycle**

of a magnitude consistent with cross-country empirical estimates, and that there is a large potential for further acceleration in growth provided the rhythm of structural reforms is accelerated, in particular in the domains of secondary education, trade openness, and public infrastructure, and provided cyclical volatility continues to decline. Improvements in other policies or indicators not included in the econometric analysis, but emphasized in the World Bank's 2004 Investment Climate Survey, such as the judiciary system, access to industrial land and the financing of small and medium enterprises would improve the investment climate and also help accelerate growth.

52. **The fourth conclusion is that Moroccan exports have not fully benefited from the recent expansion of global trade.** Indeed, while the real growth of Moroccan exports was stronger than that of developing countries as a group until the early 1990s, the pattern has reversed since then. The recent signature of several free trade agreements provides an opportunity to catch up in this regard.

53. **The fifth conclusion is that Morocco faces the risk of enjoying total factor productivity gains as a result of structural reforms, but of witnessing at the same time a rate of employment growth that is too moderate to sharply reduce urban unemployment.** This possibility calls for special attention to the evolution of the labor market following the implementation of the new labor code.

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MATHEMATICAL DERIVATIONS, ECONOMETRIC APPLICATION, AND DATA USED IN SECTION C

Derivation of Equation (2)

In order to estimate the growth rate of total factor productivity $\frac{A_t - A_{t-1}}{A_{t-1}}$ and the elasticity of output to capital α, the model presented in equation (1) is transformed as it is explained below.

First, it is assumed that total factor productivity grows on average at a constant rate over time, that is it depends on time t in the following way

$$Ln(A_t) = a + gt + \varepsilon_t \qquad (5)$$

In equation (5), a is a constant term, and g the average growth rate of total factor productivity $\frac{A_t - A_{t-1}}{A_{t-1}}$. ε_t is an "error term" that is assumed to be stationary around zero.

Second, equation (1) is written as

$$\frac{Y_t}{L_t} = A_t\left(\frac{K_t}{L_t}\right)^{\alpha} \qquad (6)$$

In equation (6), the term $\frac{Y_t}{L_t}$ is output per unit of employment, and the term $\frac{K_t}{L_t}$ is capital per unit of employment.

Third, equation (6) is written as

$$Ln\left(\frac{Y_t}{L_t}\right) = Ln(A_t) + \alpha\, Ln\left(\frac{K_t}{L_t}\right) \qquad (7)$$

Using equation(5) and equation(7), it follows that

$$Ln\left(\frac{Y_t}{L_t}\right) = a + gt + \alpha\, Ln\left(\frac{K_t}{L_t}\right) + \varepsilon_t$$

which is equation (2) that we estimate.

Data Used in Section C

The dataset for the whole economy covers the period 1960–2002.[34] Output over employment $\frac{Y_t}{L_t}$ is proxied by the ratio of Morocco's GDP to labor force ("GDP/Labor force"). Capital over employment $\frac{K_t}{L_t}$ is proxied by the ratio of Morocco's capital stock to labor force ("Capital/Labor force").[35]

Data on GDP and labor force is taken from the World Bank's World Development Indicators database. Data on gross capital formation for the period 1965–2002 is also taken from that database. The data on the stock of capital in constant prices is constructed by applying the perpetual inventory method. First, the data on gross capital formation in constant prices is extended to cover the period 1951–64, using time series on capital stock from Nehru and Dhareshwar (1993) and a depreciation rate of 4 percent, which is the rate they used to construct their capital stock series. Second, we use the Nehru and Dhareshwar's estimate of capital stock for the year 1950 to compute an estimate of capital stock in 1950. We adjust these series for the difference in the base year that is used in Nehru and Dhareshwar's investment series and the investment series from the World Development Indicators database. The estimates of capital stock for the period 1951–2002 are constructed using the extended series on gross capital formation and a depreciation rate of 5 percent. Only the estimates of capital stock for the period 1960–2002 are used in the growth analysis.

For the growth accounting exercise in the nonagricultural sector, several data sources are used. Real nonagricultural output and investment in current prices are taken from the national accounts. Labor force data come from *Annuaire Statistique du Maroc* (1973) for the year 1971, a dataset provided by the *Département des Etudes Politiques et Financières* (DEPF) for the period 1982–2002, and a dataset provided by the *Direction de la Statistique* for the period 1999–2004. This last dataset takes into account revisions of the series after the 2004 population census. Data prior to 1994 (the previous census

[34] Estimates of the elasticity of output to capital α for the period 1970-2002 do not seem plausible. Some estimates were either negative, close to one or greater than one The growth accounting exercise includes also 2003 and 2004. Given that real investment figures for these years are not yet available, estimates of capital stock for these years are constructed using the 2003 and 2004 growth rates of nominal investment. Similarly, the labor force series is extended to 2003 and 2004 using Moroccan authorities' population projections.

[35] Note that by using labor force instead of employment, it is implicitly assumed that the unemployment rate is stationary. Estimation for the shorter period for which unemployment data is available does yield estimates of the elasticity of output to capital α that are not plausible. A growth accounting exercise was done for the period 1971–2004, using the authorities' employment figures that are available. A value of 0.4 was used for the parameter α. It was found that the contribution of the residual to growth was -0.23 percent for that period, compared to a growth rate of 0.03 percent presented in Table 3.

year) are assumed to be compatible with the results of the 2004 census, and data for the period 1995–98 are adjusted in light of the new series available for 1999–2004. Finally, investment deflators are taken from the World Development Indicators dataset for the period 1970–80 and from national accounts for the period 1980–2003. This deflator is assumed to be constant between 2003 and 2004.

The elasticity of nonagricultural output to capital is assumed to be the same as for the whole economy.[36] The stock of capital in the nonagricultural sector is constructed by assuming that it is equal to 90 percent of that of the stock of the whole economy in 1969 and that investment in the nonagricultural sector during 1970–2004 is equal to the sum of the construction, public works and part of the machinery and equipment components of gross fixed capital formation.[37]The depreciation rate is also assumed to be the same as for the whole economy. In the absence of yearly data on employment in the nonagricultural sector, data on the employed urban population is used instead.

Econometric Application in Section C

The degree of variable (in logarithms) integration was examined using the Augmented Dickey-Fuller tests. (Table 8). "GDP/Labor force" is integrated of order one. "Capital/Labor force" is integrated of order two.

The Vector Error Correction Model (VECM) that was initially estimated used 7 lags. Johansen cointegration tests suggest that there is one cointegrating vector at both 1 and 5 percent level of significance (Tables 9 and 10). Only the first lag in this estimated VECM turned out to be significant.[38] So we estimated another VECM using only one lag (Table 11).
Misspecification tests for this VECM are presented in Table 12. The multivariate LM statistics shows that the residuals are not autocorrelated. The multivariate JB test rejects the hypothesis of normality of residuals. However, this rejection is due to excess kurtosis, which has less impact on properties of cointegration estimators, than if the skewness was considered a reason for the rejection.[39]

A Fully-Modified OLS (FMOLS) procedure proposed by Phillips-Hansen (1990) was also used. This procedure takes into account the endogeneity of variables and the autocorrelation of residuals. Monte Carlo simulations by Hargreaves (1994) suggest that

[36] The obtained residuals are not very sensitive to that assumption, and the analysis would yield similar results with an elasticity of .3 instead of .4.

[37] The nonagricultural share of the machinery and equipment component is assumed equal to the nonagricultural share of capital good imports in the balance of payments.

[38] The cointegrating equation for this VECM is presented in Table 1. Other tables are available upon request.

[39] See Paruolo (1997)

the FMOLS dominates other univariates estimators in the case of small sample simulations. Estimates from FMOLS are also presented in Table 2. Note that for all these estimators the signs and magnitudes of the elasticity of capital to output is in line with a priori expectations. The value of the Lc statistics is 0.39, which corresponds to a probability value of 0.17 (see Hansen 1992). This indicates that the coefficients of the estimated production function in equation (2) are stable. Moreover, since the Lc statistics is also a test of the null of cointegration, the value of the statistics suggest that the estimated relation in equation (2) is a long-term one.

Table 8. Stationarity Tests

Variables	Included in regression	Lag 1/	Test statistic	1 percent critical value 2/	5 percent critical value 2/	Conclusion
In levels (logarithm)						
GDP/Labor force	Constant	1	-2.72	-3.60	-2.94	Unit Root
GDP/Labor force	Constant, Trend	1	-1.64	-4.20	-3.52	Unit Root
Capital/Labor force	Constant	2	-1.73	-3.61	-2.94	Unit Root
Capital/Labor force	Constant, Trend	1	-1.53	-4.20	-3.52	Unit Root
In first difference in logarithm						
D (GDP/Labor force)	Constant	0	-9.27	-3.60	-2.94	Stationary
D (GDP/Labor force)	Constant, Trend	0	-9.97	-4.20	-3.52	Stationary
D (Capital/Labor force)	Constant	0	-2.59	-3.60	-2.94	Unit Root
D (Capital/Labor force)	Constant, Trend	1	-3.20	-4.21	-3.53	Unit Root
D (Capital/Labor force, 2)	Constant	2	-5.37	-3.62	-2.94	Stationary
D (Capital/Labor force, 2)	Constant, Trend	2	-5.36	-4.22	-3.53	Stationary

Source: IMF staff calculations.

1/ The number of lags is selected using the Schwartz information criterion (see Schwarz (1978)). The maximum number of lags used is 9.
2/ For the regression equations without a linear trend, the critical values are from MacKinnon (1996).

Table 9. Cointegration Rank Test (Trace): Production Function

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.57	36.42	25.87	0.0017
At most 1	0.18	6.77	12.52	0.37

Note: Trace test indicates 1 cointegrating equation at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.

Table 10. Cointegration Rank Test (Maximum Eigenvalue): Production Function

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigenvalue Statistic	0.05 Critical Value	Prob.**
None *	0.57	29.65	19.39	0.0011
At most 1	0.18	6.77	12.52	0.37

Note: Max-eigenvalue test indicates 1 cointegrating equation at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.

Table 11. Vector Error Correction, Model with 1 Lag 1/

	D (GDP/Labor force)	D (Capital/Labor force)
CointEq1	-0.49	-0.02
	[-3.36]	[-0.23]
D (GDP/Labor force (-1))	-0.20	0.06
	[-1.38]	[0.84]
D (Capital/Labor force (-1))	0.54	0.71
	[2.35]	[6.03]
Constant	0.005	0.0074
	[0.57]	[1.65]

1/ t-statistics in brackets.

Table 12. Misspecification Tests, Model with 1 Lag 1/

Multivariate tests						
	1	2	3	4	5	6
LM test	3.20 [0.52]	1.85 [0.76]	4.95 [0.29]	4.49 [0.34]	2.32 [0.68]	2.71 [0.61]
Normality JB			10.16 [0.04]			
Skewness			3.35 [0.19]			
Excess curtosis			6.81 [0.03]			

Unvivariate tests		
	GDP/ Labor force	Capital / Labor force
Weak exogeneity	6.00 [0.014]	0.03 [0.85]
Exclusion test	4.82 [0.03]	2.34 [0.13]
Normality JB	3.32 [0.19]	6.84 [0.033]

1/ Numbers in brackets are p-values.

ECONOMETRIC PROCEDURE AND DATA USED IN SECTION D

The estimation of equation (4) poses a basic econometric problem that make traditional techniques inaccurate. This problem relates to the presence of both a country-specific fixed effect and a dynamic structure (captured by the inclusion of the lagged income level) and the potential endogeneity of the right-hand side variables. To deal with these issues, Loayza and others (2005) use a two step Generalized Method of Moments (GMM) estimator, derived from the Arellano and Bond (1991) estimation procedure. This estimator takes differences of regression variables or instruments to control for unobserved effects and uses previous observations of explanatory and lagged dependent variables as instruments (which are called internal instruments). The GMM estimator combines equation (4) in levels and the first difference of equation (4) into one system. In order to obtain consistent estimates, Loayza and others (2005) use lagged levels and differences of the right-hand side variables, as far as these are valid instruments (e.g. using a Sargan test). The GMM estimation uses a panel structure consisting of non-overlapping quinquennial data for 1960–99. In order to take into account important data points that have a role in the correction of the endogeneity problem, time dummies (capturing period shifts) are also included in the estimation, with respect to a benchmark period (1966–70).

The description and source of the data used in Section D are presented in Table 13, but the construction of the measure of trade openness requires further explanation. This measure is the ratio of the volume of trade (real exports plus imports) over GDP, adjusted for the size (area and population) of the country, per capita GDP, whether it is landlocked, and whether it is an oil exporter. This structure-adjusted trade volume is preferred to the unadjusted measure because some of Loayza and others' econometric estimates and projections are based on cross-country comparisons. Without the adjustment, they argue that the model would be unfairly attributing to trade policy what is merely the result of structural country characteristics. Indeed small countries are more dependent on international trade than large ones, oil exporters can have quite large volumes of trade and at the same time impose high import tariffs, and landlocked countries face large transport and trading costs and thus trade less than countries with port access. Thus, in the particular case of trade openness, the econometric technique requires the use of an auxiliary variable. It is the residual from the regression of the trade intensity ratio to population, area, level of per capita GDP, transport costs and an oil dummy as in Pritchett (1996).

Finally, the decomposition of growth accelerations presented in Table 6 requires to solve the problem of fitting regressors corresponding to periods of varying length using the econometric model described by equation (4) that has parameters estimated using five-year lagged variables. The technique to solve this problem consists in the application of a general recursive equation, as in equation (8):

$$E\left[g_{t,t+c} - g_{t-d,t}\right] = \hat{\lambda}_A (y_{it} - y_{it-d})\frac{5}{d} + \hat{\alpha}_A (y_{it}^C - y_{it-d}^C)\frac{5}{d} + \hat{\beta}'(X_{it+c}^I - X_{it}^I) + \hat{\gamma}'(X_{it+c}^S - X_{it}^S) + \hat{\delta}(t_{it+c} - t_{it}) + (\hat{\mu}_{t+c} - \hat{\mu}_t) \quad (8)$$

where $g_{t,t+c}$ is the average growth rate between t and *t+c*; and *t+c* and *t-d* are the upper and lower bounds of the periods under estimation. This form makes it possible to apply the coefficients from Loayza and others (2005) to the periods of Table 6. Two adjustments are made. First it is necessary to correct the lagged term related to transitional convergence and cyclical recovery that are originally defined for five-year periods. The lambda and alpha coefficients are defined for variables under five-year lags, but in the periods of Table 6 there are no five-year lagged terms anymore, but terms with d lags. Therefore, a transformation of the lagged terms on a d-year period change into a five-year equivalent change is needed. To do this, the lagged term is divided by d—to obtain a sort of average change per year—and multiplied by 5 so the annual average is transformed into a five-year change. The second problem to be solved is that the lambda and alpha coefficients are constant terms that distribute the lagged differences into a five-year period, as the original coefficients refer to five-year periods. However, in this general case, the next period is not a five-year, but a d period. As a result, the lambda and alpha coefficients require a simple transformation of five-year annual 'rates' into a c-year annual rate (using an exponential form), such that they also are consistent with the five-year lagged terms. In algebraic terms, this transformation can be written as follows:

$$\hat{\lambda}_A = \left[(1+\hat{\lambda})\right]^{\frac{c}{5}} - 1 \text{ and } \hat{\alpha}_A = \left[(1+\hat{\alpha}^C)\right]^{\frac{c}{5}} - 1$$

Table 13. Definitions and Sources of Variables Used in Section D

Variable	Definition	Source
Output growth	Log difference of real GDP per capita.	Summers and Heston (1991) and *World Development Indicators 2004*.
Initial GDP per capita	Initial value of the ratio of total GDP to total population; GDP is in 1985 PPP-adjusted U.S. dollars.	Summers and Heston (1991) and *World Development Indicators 2004*.
Initial output gap	Difference between the log of actual GDP and the log of potential (trend) GDP around the start of the period; Loayza and others (2005) use the Baxter-King filter to decompose the log of GDP.	Authors' calculations.
Education	Ratio of total secondary enrollment (regardless of age) to the population of the age group that officially corresponds to that level of education.	Easterly and Sewadeh (2002) and *World Development Indicators 2004*.
Financial depth	Ratio to GDP of the stock of claims on the private sector by deposit money banks and other financial institutions.	Beck, Demirgüç-Kunt, and Levine (2000) and *World Development Indicators 2004*.
Trade openness	The residual of a regression of the log of the ratio of exports and imports (in 1995 U.S. dollars) to GDP (in 1995 U.S. dollars), on the logs of area and population, a dummy for oil-exporting countries, and a dummy for landlocked countries.	Calculations using raw data from Easterly and Sewadeh (2002) and *World Development Indicators 2004*.
Government burden	Ratio of government consumption to GDP.	*World Development Indicators 2004*.
Public infrastructure	Number of telephone mainlines per 1,000 people in the country: telephone mainlines are telephone lines connecting a customer's equipment to the public switched telephone network.	Canning (1998), ITU (2004), and *World Development Indicators 2004*.
Governance	First principal component of four indicators (prevalence of law and order, quality of bureaucracy, absence of corruption, and accountability of public officials).	International Country Risk Guide (PRS Group 2002).
Lack of price stability	Measured by the consumer price index (that is, the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services).	*World Development Indicators 2004*.
Cyclical volatility	Standard deviation of the output gap for the period.	Authors' calculations.
Real exchange rate level	Real effective exchange rate, with the level adjusted such that the average for 1976–85 equals the distortion index in Dollar (1992).	Easterly (2001) and *World Development Indicators 2004*.
Financial crises	Number of years in which a country underwent a systemic banking crisis, as a fraction of the number of years in the corresponding period.	Author's calculations using data from Caprio and Klingebiel (2004) and Kaminsky and Reinhart (1998).
Terms-of-trade shocks	Log difference of the terms of trade; the terms of trade are defined as customary.	*World Development Indicators 2004*.

Source: Gallego (2005).

Table 14. Determinants of Economic Growth, Basic Regression in Loayza and Others (2005)

GMM-IV System Estimator

Dependent Variable: Growth Rate of GDP per Capita	
Constant	0.1216
	(2.79)
Transitional Convergence:	
Initial GDP per capita	-0.0176
(in logs)	(3.80)
Cyclical Reversion:	
Initial Output Gap	-0.2371
(log[actual GDP/potential GDP])	(8.52)
Structural Policies and Institutions	
Education	0.0172
(secondary enrollment, in logs)	(6.70)
Financial Depth	0.0066
(domestic credit to private sector, in logs)	(4.28)
Trade Openness	0.0096
(structure-adjusted trade volume/GDP, in logs)	(3.14)
Government Burden	-0.0154
(government consumption/GDP, in logs)	(3.18)
Public Infrastructure	0.0071
(main telephone lines per capita, in logs)	(2.71)
Governance	-0.0012
(as ratio of exports plus imports to GDP, in logs)	(0.68)
Stabilization Policies:	
Lack of Price Stability	-0.0048
(inflation rate, in log [100+inflation rate])	(1.89)
Cyclical Volatility	-0.2771
(standard deviation of output gap)	(3.76)
Real Exchange Rate Level	-0.0061
(in logs)	(3.90)
Financial Crises	-0.0289
(frequency of years under crisis: 0-1)	(7.42)
External Conditions:	
Terms of Trade Shocks	0.0720
(log difference of the terms of trade)	(4.98)
Period Shifts (benchmark: 1966–70)	
1971–75	-0.0090
1976–80	-0.0092
1981–85	-0.0238
1986–90	-0.0194
1991–95	-0.0258
1996–99	-0.0270
SPECIFICATION TESTS (P-values)	
Sargan Test	0.996
Serial Correlation	
First-Order	0.000
Second-Order	0.461
Number of Countries/Observations	78/350

Numbers in parentheses represent the absolute value of t-statistics.
Source: Loayza and others (2005).

II. MOROCCO: EXCHANGE RATE REGIME[40]

A. Introduction

54. **Over the past decade, Morocco has achieved stable macroeconomic and financial conditions with an exchange rate peg.** Inflation has remained low, the external current account balance has shifted from deficits to surpluses, and external official reserves have increased and reached a comfortable level (Tables 2–4). However, growth has been low and volatile.

55. **The key challenge for the Moroccan authorities is to achieve sustainable high rates of growth to reduce poverty and unemployment.** To these ends, the authorities have embarked on a broad-based structural reform program with a view to promote private investment and to improve the productivity and competitiveness of the Moroccan economy. They are also committed to fiscal consolidation to reduce public debt and enhance private sector confidence. Moreover, they are attentive to the appropriateness of the exchange rate regime for ensuring a supportive exchange rate level in the context of Morocco's increasing integration into the world economy. Trade is being liberalized at the multilateral, regional, and bilateral levels. After achieving current account convertibility and liberalizing most capital account transactions for nonresidents, the authorities intend to gradually eliminate remaining capital account restrictions (Appendix I).

56. **In this context, the Moroccan authorities asked the Fund staff during the 2004 Article IV consultation discussions to examine the exchange rate regime options for their country** with due consideration to the structure and characteristics of its economy as well as the direction of their policies. They also requested the study to cover operational and institutional issues that would be involved in a regime change.

57. **This chapter attempts to identify an appropriate exchange rate regime for Morocco** in light of analytical considerations that have been identified in the literature as important factors affecting the adoption and performance of exchange rate regimes as well as the authorities' current and future policy intentions. It should be noted at the outset that there are no simple prescriptions for the choice of a country's exchange rate regimes and analytical considerations do not support uniform policy prescriptions for exchange rate regimes. Indeed, in their discussions of exchange rate regimes, the IMF Executive Directors have not asserted the superiority of one exchange regime over another. They have, however, emphasized that sound macroeconomic and structural policies are essential for maintaining any type of regime. It should also be noted that, in theory, wage and price flexibility can substitute for exchange rate flexibility as shock absorbers. The chapter assumes that price and wage flexibility is low in Morocco.

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[40] Principal authors are Sena Eken, Abdourahmane Sarr, Jacques Bouhga-Hagbe and Jérôme Vandenbussche. Research assistance was provided by Fernanda Sayavedra. The Moroccan authorities kindly provided data for and helpful comments on earlier versions of this chapter.

58. **According to the findings of the chapter, it is difficult to make a case against the current exchange rate regime based on historical evidence on the structure of the Moroccan economy, but forward-looking considerations strengthen the case for a flexible regime.** The current exchange rate regime has served Morocco well and the evidence does not suggest that the current level of the exchange rate is misaligned. With ongoing trade liberalization and the intended gradual elimination of remaining capital account restrictions, Morocco will be increasingly integrating into the world economy. Furthermore Morocco is undertaking a broad range of structural reforms. In the circumstances, a more flexible exchange rate regime would help reap the benefits of integration and minimize the associated risks. In light of Morocco's strong external position, low inflation, and the closeness of the real exchange rate to equilibrium exchange rate estimates, an exit from the peg is likely to be orderly, and a transition to a managed float with a horizontal band should be feasible. However, a transition to exchange rate flexibility would require setting up a new monetary framework as a precondition that would provide a nominal anchor to replace the exchange rate in due course, developing liquid foreign exchange and money markets, designing intervention policies, and strengthening of risk management capacities.

59. **The remainder of the chapter is organized as follows.** Section B describes Morocco's exchange rate regime and the evolution of the dirham during the past two decades. Section C summarizes the analytical considerations for regime choice and discusses their implications based on historical evidence for Morocco. Section D analyzes forward-looking considerations in light of the authorities' policy strategy and their implications for the exchange regime. Section E assesses the desirable degree of flexibility in the circumstances of Morocco. Section F discusses the institutional and operational requisites for a successful transition toward exchange rate flexibility. Section G summarizes the main findings and offers concluding remarks.

B. Exchange Rate Regime and Performance

60. **In this section, a brief description of Morocco's exchange rate regime and its performance is presented.** The competitiveness of the Moroccan economy is examined in light of real exchange rate movements and Morocco's share in export markets. The relative price of tradables to nontradables is also discussed as a potential signal of the profitability and attractiveness of the tradables sector in Morocco. In addition, balance of payments equilibrium exchange rates are estimated and their evolution is compared to that of the real effective exchange rate.

61. **Morocco's currency is officially pegged to a basket of currencies dominated by the Euro, but also including the US dollar and other currencies.** The weights of the currencies in the basket reflect the pattern of Morocco's trade. Bank Al-Maghrib (BAM), the central bank, intervenes in the market during the day by setting the buying and selling rates applicable to its operations with banks based on the aforementioned basket of currencies. For foreign exchange operations with customers, banks may not exceed the rate limits set by BAM. Banks charge a commission of 0.2 percent on their foreign exchange transactions. Under the natural classification proposed by Reinhart and Rogoff (2004), Morocco's

exchange rate regime can be described as a "fixed" exchange regime with a moving band of plus or minus 2 percent around the Euro (Box 1 and Table 5).

62. **The appreciation of the dirham in real effective terms has been reversed since 2001.** The 5 percent nominal devaluation of the dirham in April 2001, which the authorities achieved by increasing the weight of the Euro in the basket, partly reversed the real appreciation experienced since the early 1990s (Figure 1). Since the devaluation, the dirham continued to depreciate in real effective terms reflecting partly the low inflation in Morocco relative to its trading partners and partly the appreciation of the euro with respect to the dollar (Figure 2).

Box 1. A Natural Classification of Exchange Rate Regimes in Retrospect [1]

***De jure* and *de facto* classifications of exchange rate regimes can differ substantially.** Reinhart and Rogoff (2004), and Gosh, Gulde and Wolf (2003) find that there is a non-negligible divergence between countries' stated and actual policies regarding their exchange rate regime. *De facto* classifications of exchange rate regimes, which combine available information on the actual exchange rates including in the parallel market, the monetary policy framework, and reserves movements among others, are more relevant to the analysis of the determinants and performances of exchange rate regimes because they better reflect economic forces at play in countries.

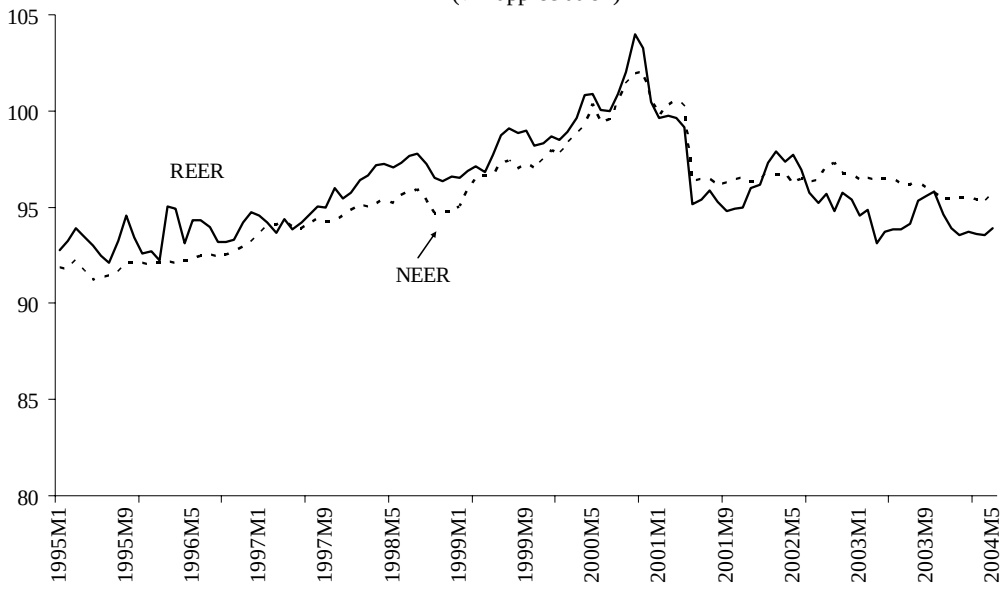
***De facto* exchange rate regimes can be classified in five broad categories**, according to the "natural" classification proposed by Reinhart and Rogoff (2004). The first broad category can be called **"fixed" exchange rate regime** . It includes countries with no separate legal tender, or countries with either a preannounced peg, a currency board arrangement, a preannounced horizontal band that is narrower than or equal to plus or minus 2 percent, or countries with a *de facto* peg. Almost all countries' exchange rate regimes were under this category in the 1940s. In 2000, only 40 percent of countries' exchange rate regimes fell under this category. The second broad category is the **"limited flexibility" exchange rate regime**. It includes countries with either a preannounced crawling pegs, or a preannounced crawling band that is narrower than or equal to plus or minus 2 percent, or a *de facto* crawling peg or a *de facto* crawling band that is narrower than or equal to plus or minus 2 percent. In 2000, about 20 percent of countries fell under this category. The third broad category is the **"managed floating" exchange rate regime**. This category includes countries with either a preannounced crawling band that is wider than or equal to plus or minus 2 percent, or a *de facto* crawling peg or a *de facto* crawling band that is wider than or equal to plus or minus 2 percent, or a moving band that is narrower than or equal to plus or minus 2 percent (i.e. allows for both appreciation and depreciation), or with managed floating. About 20 percent of countries fell under this category in 2000. The fourth category is the **freely floating exchange rate regime**. A little less than 10 percent of countries fell under this category in 2000. Finally, the fifth broad category is the **"freely falling" exchange rate regime**. It includes countries where the parallel market broad exchange rate differs substantially from the official rate and where the 12-month rate of inflation exceeds 40 percent. Less than 10 percent of countries fell under this category in 2000.

[1] Source: Rogoff and others (2004)

63. **Morocco's shares in exports markets are not improving** (Figure 3)**,** but their evolution is comparable to that of the other countries in the region. Morocco's share in world exports has remained constant since 1980 when other developing countries, in particular in Asia, substantially increased theirs. This performance, however, is the same as Tunisia's, and is better than that of other comparable countries in the region, except for Turkey. The pattern is the same when looking at exports to the European Union, except that eastern European

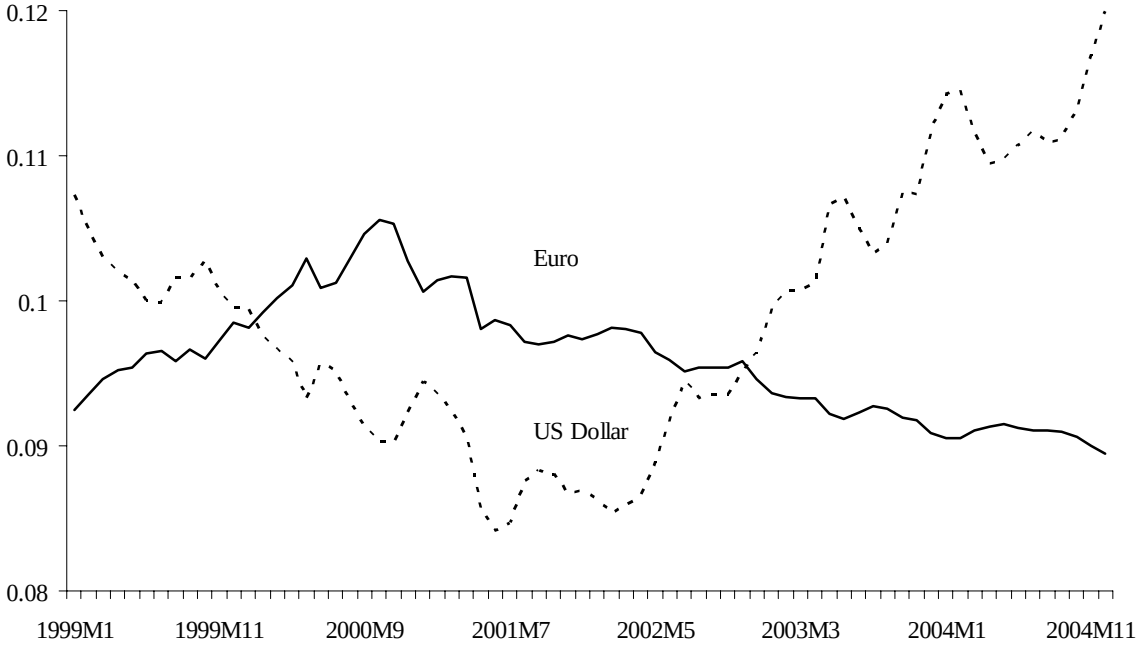
countries such as Poland have substantially increased their market share in the 1990s (Figure 4).

Figure 1. CPI-Based Nominal and Real Effective Exchange Rates, 1995–2004
(↑ = appreciation)



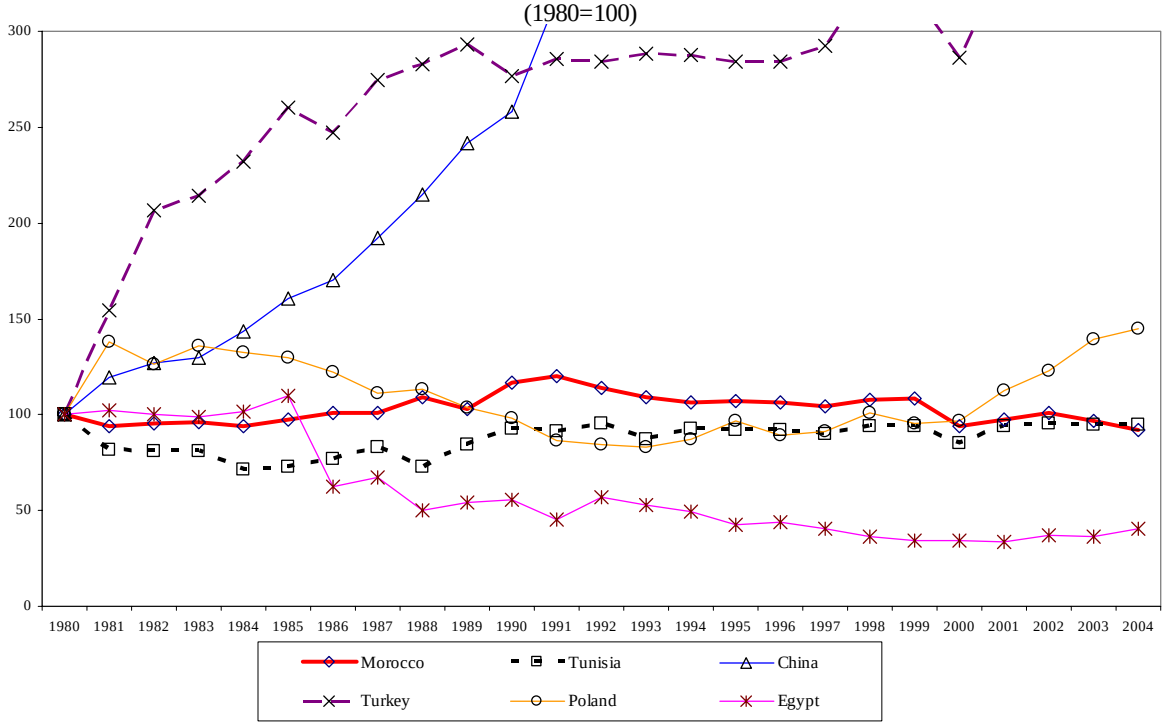
Source: International Monetary Fund, Information Notice

Figure 2. Nominal Exchange Rate, 1995–2004
(Currency per Dirham)



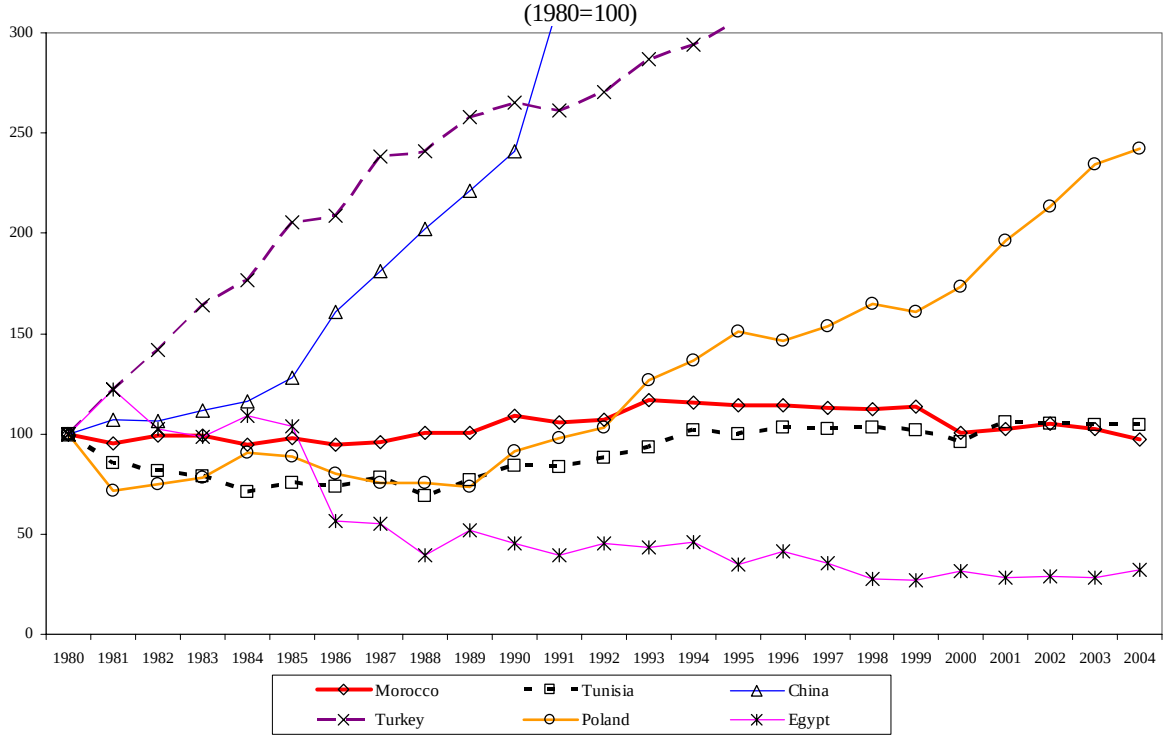
Source: International Monetary Fund, Information Notice System.

Figure 3. Competitiveness Indicators: Share of Selected Countries' Exports in World Imports, 1980–2004
(1980=100)



Sources: Moroccan authorities; and IMF staff estimates.

Figure 4. Competitiveness Indicators: Share of Selected Countries' Exports in EU Imports, 1980–2004
(1980=100)



Sources: Moroccan authorities; and IMF staff estimates.

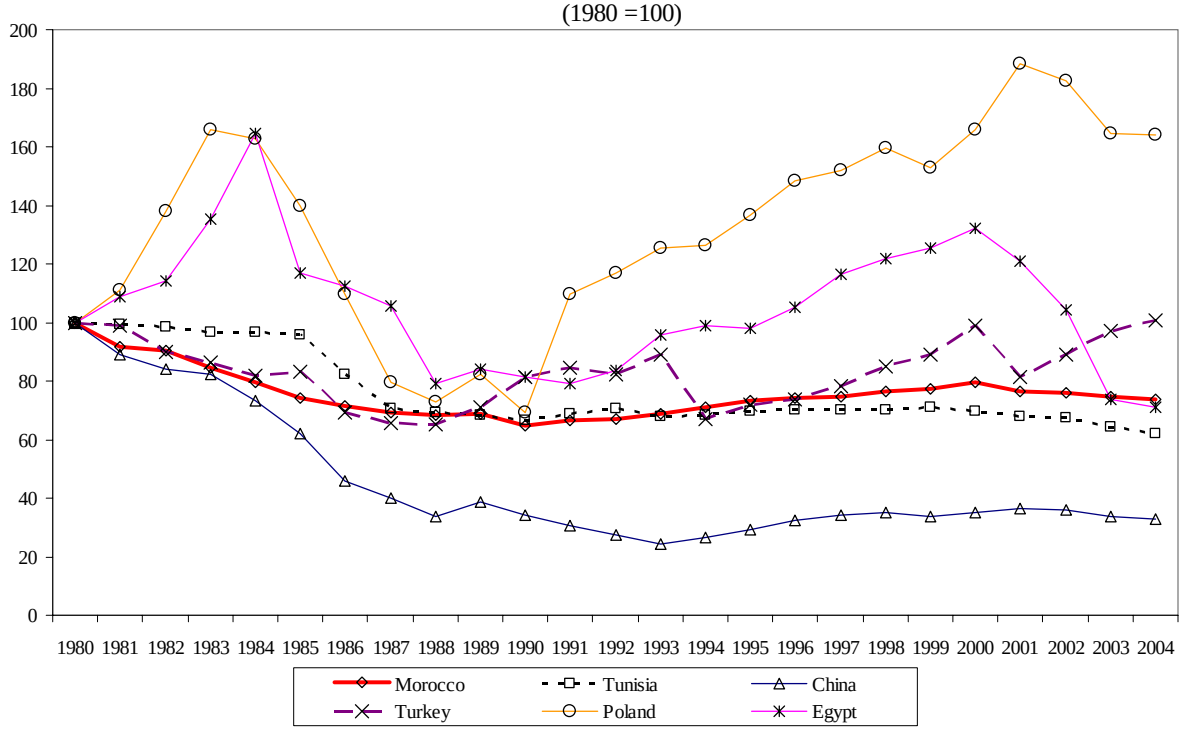
64. **Morocco's export performance since 1980 cannot be explained solely by movements in real effective exchange rates.** Empirical analysis suggests that the real exchange rate affects Morocco's exports, as would be expected (Tables 9a and 9b). However, while some of Morocco's competitors, such as China, have benefited from a relatively faster real exchange rate depreciation since the 1980s (Figure 5), other strong performers, such as Turkey and Poland, did not. Moreover, the relative price of tradables to nontradables,[41] a proxy measure of the real exchange rate, does not show any particular trend over the period[42] (Figure 6).

65. **Recent developments in the real effective exchange rate, the strong balance of payments position, and equilibrium exchange rate estimates do not point to a misalignment of the Dirham.** The "equilibrium" level of the exchange rate remains a theoretical concept and there are many estimation approaches (see Box 2). The model of the balance of payments equilibrium exchange rate (BPEER) used to estimate Morocco's equilibrium exchange rate indicates that the dirham is not misaligned ((Figures 7a and 7b), see Appendix III for details). It is important to note that as a statistical model, the BPEER curves in Figures 7a and 7b can "shift" up or down as parameters vary within "roughly two standard deviations" of their point estimates. What matters is that the estimated "time varying" equilibrium real exchange rate has not been "too far" from the actual values of the real exchange rate during the recent years, implying that there is no evidence, from this estimator, of a significant misalignment. In addition, from 1994 onwards, the equilibrium exchange rate based on purchasing power parity (constant REER) is not significantly different from the BPEER estimates.

[41] The price of tradable goods is computed as a weighted average of the deflators of the primary, mining and manufacturing sectors in the national accounts, while the price of nontradable goods is computed as a weighted average of the deflators of the construction and services sectors in the national accounts.

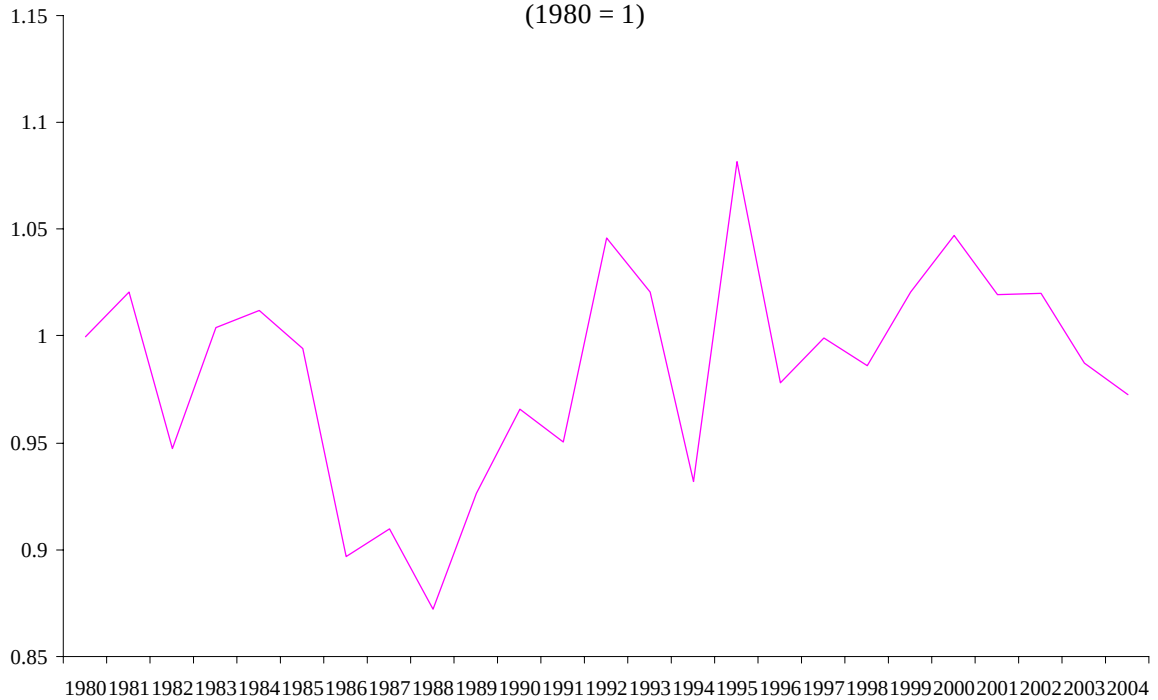
[42] Alternative competitiveness indicators, such as productivity-adjusted wages could not be examined because of unavailability of data.

Figure 5. Competitiveness Indicators: Selected Countries' Real Effective Exchange Rate, 1980–2004
(1980 =100)



Sources: Moroccan authorities; and IMF staff estimates.

Figure 6. Relative Price of Tradables to Nontradables, 1970–2004
(1980 = 1)



Sources: Moroccan authorities; and IMF staff estimates.

Box 2. Main Theoretical Approaches to Determining "Equilibrium" Exchange Rate

In order to model how market forces could affect the "equilibrium" exchange rate, one could ideally elaborate a theoretical framework that takes into account all aspects of the economy and trace their ultimate impact on the exchange rate. Such models are based on an internal-external balance framework.[1] However, there are difficulties related to this approach. They mostly deal with tractability as one must have to fully specify a multilateral structural model. Moreover, this approach does not provide an empirical link between a real exchange rate and its determinants.

Most of the literature on equilibrium exchange-rate modeling essentially deals with tracing the impact that the economic forces, considered as most relevant, will have on balance of payments transactions and indirectly on the exchange rate (See MacDonald, 1995 and Rogoff, 1996). It can be classified in three main branches depending on whether the economic forces considered as most relevant interact through the current or the capital account of the balance of payments or both.

- **The purchasing power parity (PPP) theory** focuses on current account transactions. It hypothesizes that the long-run exchange rate is determined by domestic prices relative to foreign prices. Formulations vary depending on the emphasis put on factors that can affect prices. They include transportation costs, impediments to trade, productivity shocks, the bias of domestic demand toward nontraded goods, national savings and investment, and the effects the fiscal stance can have on them. This literature considers that in the long run net capital flows are zero, and equilibrium occurs when the current account is balanced. Even though there can be an array of factors such as central bank intervention and long- and short-term capital flows, that can keep the actual exchange rate away from its PPP-determined rate, it will eventually move in line with its PPP rate. According to this view, the real exchange rate is stationary.

- **The efficient market view of purchasing power parity (EMPPP) or the uncovered interest parity (UIP) theory**. It asserts that in a world of high capital mobility, it is not goods arbitrage, but arbitrage in the capital account through interest rate arbitrage that matters. This would imply that the real interest rate differential is determined by the expected real exchange rate differential. The real exchange rate would not necessarily be stationary. There are other variants of the UIP theory that tie the expected real exchange rate differentials to fundamentals in a manner similar to the PPP theory (see MacDonald, 1997). They can then link the two theories to determine equilibrium exchange rates. This strand of the literature tends to refine the predictions of both the PPP and UIP theories.

- **Models based on balance of payments equilibrium** rely on overall BOP transactions to explain exchange rate determination. This is the approach used to estimate Morocco's time-varying "equilibrium" real exchange rate. Its main advantage is that this approaches does not require a priori assumptions on the relative importance of international goods and capital markets in exchange rate determination. The balance of payments equilibrium exchange rate (BPEER) framework hypothesizes that a country's long-run real exchange rate, defined as the price of domestic goods relative to that of foreign goods, is determined when the overall balance of payments, excluding reserve assets accumulation, is zero. The intuition for excluding reserve assets accumulation is that such an accumulation is more a result of (central bank) policy than interaction of market forces. The framework assumes that in the current account net exports (including services) negatively depend on domestic output and the real exchange rate appreciation, and positively depend on foreign output. The balance on the income account depends on the country's stock of net foreign assets. Since capital and financial account flows in Morocco are mostly driven by government transactions and not interest rate differentials, the effect of such flows are captured by changes in net foreign assets. Other explanatory variables can easily be added in the framework.

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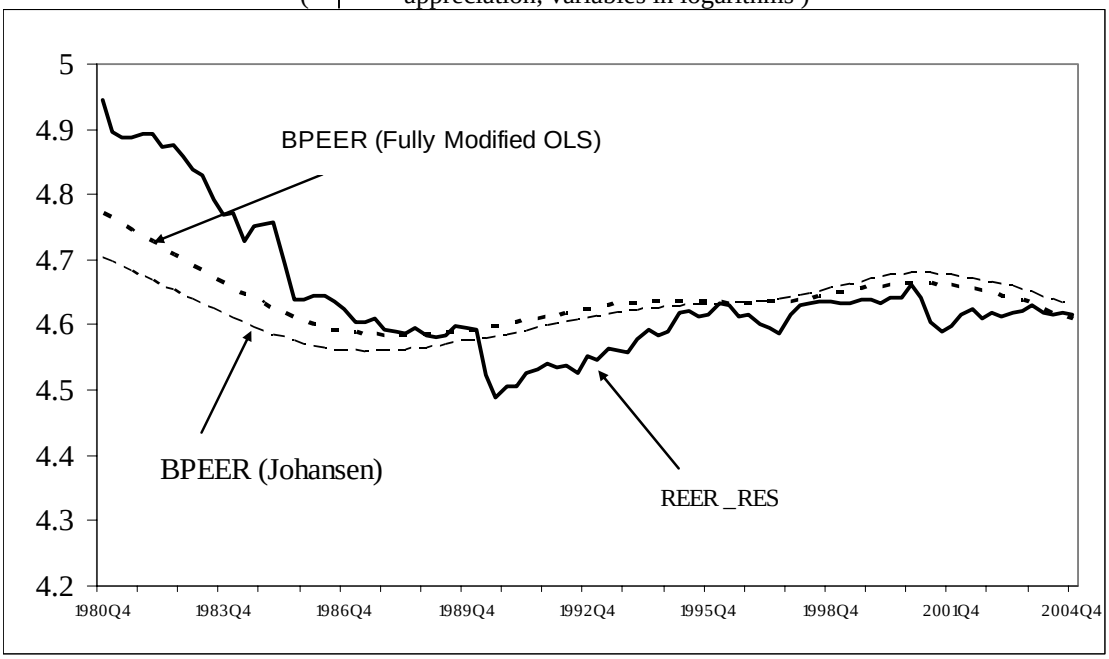
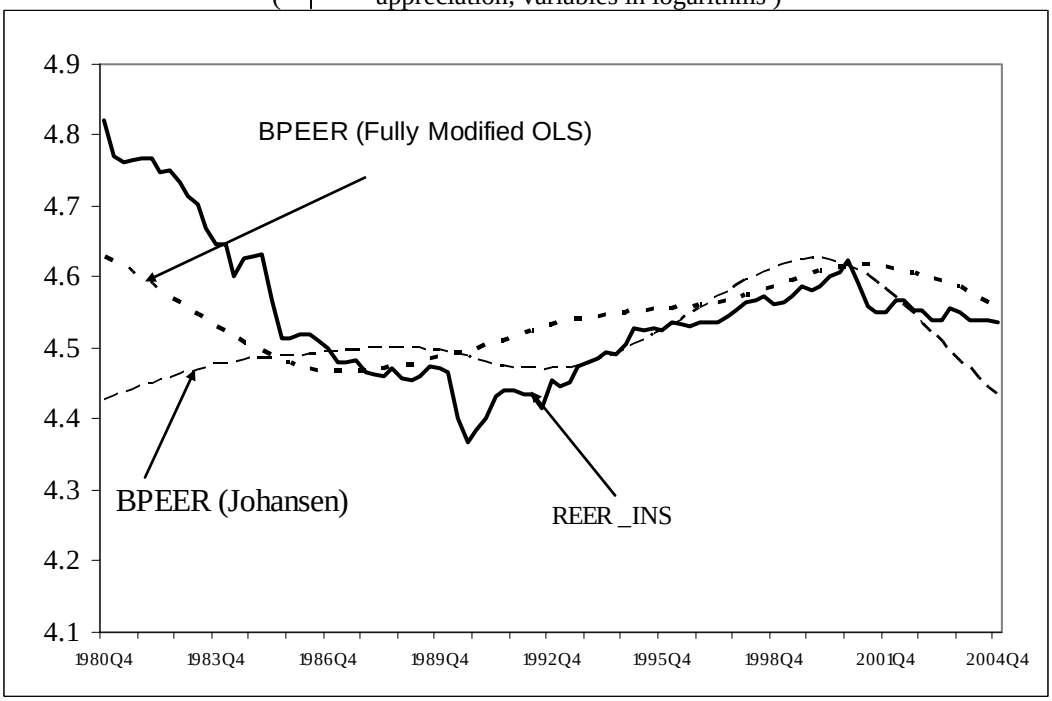
[1] This concept was originally proposed by Williamson(1985). Discussions of this concept could also be found in Wren-Lewis (1992), Williamson (1994), and the references therein. An alternative internal-external balance approach to modeling equilibrium exchange rates can be found in Stein(1995).

Figure 7a. REER vs. BPEER, 1980–2004, Based on 1999–2001 Trade Weights
(↑ = appreciation, variables in logarithms)



Source: IMF staff estimates.

Figure 7b. REER vs. BPEER, 1980–2004, Based on 1989–91 Trade Weights
(↑ = appreciation, variables in logarithms)



Source: IMF staff estimates.

C. Analytical Considerations on the Choice of the Exchange Rate Regime

66. This section briefly summarizes some of the main analytical considerations that have been identified in the literature for the choice of exchange rate regimes. It then presents the implications of these considerations on whether or not Morocco should peg using alternative quantitative measures of the various considerations developed by Husain (2004).

Considerations and indicators identified in the literature

67. The choice of an exchange rate regime depends on the authorities' economic objectives, the structural characteristics of the economy, and the nature of shocks to the economy. Therefore, various considerations could have different implications for adopting fixed or flexible exchange rates. The fact that different criteria may suggest different regimes is also in line with the empirical findings in the literature.[43] Furthermore, the importance of each consideration tends to change over time, as discussed in the next section. In the literature, considerations on the choice of whether to peg or not to peg include the following:

- **Openness of the economy and economic integration**. The more open the economy to trade and the greater the degree of integration of the economy's trade with its partners, the stronger is the case for a fixed exchange rate as exchange rate variability may discourage trade and investment. A fixed exchange rate is viewed as a means to promote trade through reductions in exchange rate variability and the associated transaction costs. However, the empirical findings on the relationship between exchange rate regime and trade are not robust and the potential impact of exchange rate volatility on trade could be mitigated with appropriate financial instruments.[44] Moreover, a floating exchange regime does not necessarily translate into an erratic exchange rate. In conditions of price stability, low susceptibility to terms of trade shocks and volatile capital flows, and deep markets, a floating exchange rate may in fact be reasonably stable. Furthermore, an open economy may be susceptible to external shocks, which a flexible exchange rate can help absorb. Therefore, it may not be possible, even in a partial analysis, to use the transactions costs argument in isolation from some of the other indicators.

- **Financial integration**. Advantages of fixed exchange rates decline as the economy's integration to global financial markets increases. Countries with open capital accounts, greater exposure to international capital flows, and fixed exchange rates have been more prone to crises. In theory, financial integration is not incompatible

[43] See Juhn and Mauro (2002); Rogoff and others (2004).

[44] As regards the impact of exchange rate volatility on trade, Clark and others (2004) find that overall, there is no robust evidence of a large negative effect of exchange rate volatility on trade. This may suggest that from the perspective of enhancing trade, exchange rate volatility is not likely to be a major policy concern. However, this does not rule out the possibility that a large exchange rate volatility could affect an economy through other channels.

with a fixed exchange rate. If a country gives up monetary independence and has a well supervised financial sector, financial instability does not have to follow from a fixed exchange rate, ceteris paribus. However, this combination is unlikely in emerging market countries as institutions are not as developed and risk management capabilities are weak.

- **Economic diversification**. Countries whose production and exports are not diversified will be more vulnerable to shocks and require exchange rate flexibility to facilitate adjustment to shocks. This is because an exchange rate can get seriously misaligned under a peg. However, a diversified economy may actually be in a better position to float since the exchange rate is likely to be more stable were it to float in such a context.

- **Real versus nominal shocks**. In countries where monetary shocks are more important than real shocks, a fixed exchange rate will be more effective in stabilizing output. In these cases, a high degree of capital mobility makes the fixed exchange rate more effective. In countries, where real shocks are more important, a fixed exchange rate provides a better insulation of output if capital mobility is low. However, under a fixed exchange rate, high capital mobility will amplify the destabilizing effects of a real shock. Thus, in countries where real shocks are more important and capital mobility is high, flexible exchange rates will be preferable.

- **Achieving credibility**. In advanced economies, growth has benefited from flexible exchange rate regimes in environments where central banks had credibility in maintaining price stability and the financial sector infrastructure was strong (Rogoff and others 2004). In contrast, developing countries with institutional weaknesses and difficulties in maintaining low inflation may gain credibility through pegging their exchange rates. Thus, countries with high inflation, and underdeveloped financial sectors, could benefit from pegging their exchange rates.

- **Balance sheet effects**. In highly dollarized economies, exchange rate movements can result in major balance sheet effects in the banking, corporate, and public sectors, and may be highly disruptive in the near term. Therefore, fixed exchange rate regimes tend to be more prevalent in these economies, consistent with the fear of floating literature.[45] The degree of pass through of exchange rate changes to domestic prices also has a bearing on the effectiveness of exchange rate policy. The higher the pass through, the stronger is the case for fixing the exchange rate.

[45] Fear of floating relates to the reluctance to allow the exchange rate to fluctuate freely because of concerns about potentially negative consequences of large currency appreciations, a rise in inflation through large currency depreciations, balance sheet effects from currency mismatches, and a lack of policy credibility.

Implications of the indicators for Morocco

68. Husain (2004) attempts to quantitatively assess the implication of the above described considerations on whether or not a fixed exchange rate regime is appropriate for a number of countries, including Morocco. The assessment is undertaken by looking at the historical importance of each factor in a given country relative to other countries. For each factor alternative measures are used. The implications of each measure for Morocco are presented in Table 1 and discussed briefly below.

69. **The results reflect the measures used for operationalizing the analytical considerations and indeed alternative measures for the same consideration sometimes suggest different regimes for the case of Morocco.** Other considerations which are noted in the discussion below could also point in the opposite direction in terms of regime choice.

- **Economic integration considerations indicate a moderate case in favor of a peg, principally on account of Morocco's heavy reliance on trade with a single currency area.** It is true that the shares of Morocco's exports to and imports from the EU are very high and that a fixed exchange rate could reduce associated transaction costs and promote trade. However, the economic cycles in the EU and Morocco are weakly correlated. This is mainly because of the volatility of Morocco's agriculture, which reduces the already moderate correlation of the nonagricultural sector with the EU economic cycles. This low correlation combined with the fact that labor mobility is limited between them, weakens the case for a peg.

- **Financial integration considerations suggest a moderate case against a peg mainly on account of inclusion of Morocco in all the major emerging market indices and the level of financial development.** The indicators of financial integration used may not appropriately capture the importance of international capital flows as they are significantly affected by domestic factors. Ideally one should look at capital account regulations (See Appendix I) and domestic determinants of financial sector development. Since indices of capital controls that capture true capital account openness do not exist, the degree of capital account openness may need to be evaluated on a country by country basis using actual capital flows. Capital account transactions in Morocco are very small. This is captured in the capital flows to GDP index which suggests a moderate case for a peg. Moreover, it is worth noting that the securities market is shallow and mainly reflects residents' participation.

- **Diversification considerations point to a moderate case in favor of a peg mainly on account of its relatively low terms of trade volatility and the low impact of commodity price fluctuations on economic activity.** Terms of trade shocks have been small for Morocco despite the fact that the country is one of the largest exporters of phosphates. This could be explained by movements of import prices that reduced the impact of changes in phosphate prices over the period and by the relatively diversified exports. There is no reason to assume that this negative correlation should continue in the future.

Table 1. Quantitative Assessment of Factors Affecting the Choice of Exchange Rate Regimes 1/

	All Countries 2/		Morocco	
	Range	Median	Score	Quantile 3/
Economic integration				**2**
Trade orientation (exports and imports of goods and services in percent of GDP, avg. 1999-2002)	18.1–271.7	54.77	68.23	3
Trade pattern concentration (export share of key partner currency in percent of total exports)	22.6–76.9	38.00	71.14	1
Cyclical synchronicity with trade partner (real GDP growth correlation with key export partner)	0.06–0.91	0.19	0.15	3
Financial integration				**4**
Inclusion in major indices 4/				5
Stock market capitalization (in percent of GDP; end-2003)	0.5–454.8	28.55	27.14	3
Financial development (ratio of broad money to GDP, 1992-2002; in percent)	9.28–227.27	45.70	80.60	4
Capital flows (ratio to GDP, 1995-2003)	0.002–2.03	0.10	0.07	2
Economic diversification				**2**
Terms of trade volatility (coefficient of variation)	0.01–.60	0.09	0.07	2
Primary commodities exports (share in total exports)	0.02–0.98	0.21	0.16	2
Primary commodities exports (ratio to GDP)	0.0–0.40	0.05	0.03	2
Commodity prices and activity, 1985-2003 (correlation of annual percent changes in country's key commodities prices and real GDP)	-.59–.70	0.08	-0.40	1
Monetary independence				**3**
Trade versus capital flows (ratio of cumulative capital flows to trade flows in millions of dollars, 1995-2003)	0.02–1.34	0.16	0.10	2
Monetary volatility (coefficient of variation of monetization, 1993-2002)	0.03–0.33	0.13	0.14	3
Real versus Monetary shocks, 1993-2002 (ratio of coefficient of variation of velocity to that of terms of trade)	0.22–20.19	2.01	2.01	3
Real versus Monetary shocks, 1993-2002 (ratio of coefficient of variation of velocity to that of GDP)	0.0–1.2	0.13	0.07	4
Credibility				**5**
Inflation history--8 percent (proportion of months in which y-o-y CPI inflation exceeded 8 percent)	0.0–1.0	0.28	0.00	5
Inflation history--10 percent (proportion of months in which y-o-y CPI inflation exceeded 10 percent)	0.0–1.0	0.15	0.00	5
Fear of floating type effects				**4**
Dollarization	0.0–22	8.00	0.00 5/	5
Balance sheet effects (correlation of percent changes of real GDP and NEER)	-0.92–0.85	0.02	-0.11	3
Exchange rate pass through (correlation of y-o-y percent changes of NEER and CPI, 1994-2003)	-0.89–0.85	-0.29	0.37	4

Sources: Husain (2004) and IMF staff estimates.
1/ The scoring of this table should be interpreted with caution and in conjunction with caveats indicated in the main text.
2/ A sample of 52 economies, which includes a wide range of countries of various sizes and levels of development, and spanning all major regions (see Appendix II).
3/ 1= case for peg; 2= moderate case for peg; 3= neutral; 4= moderate case against peg; and 5= case against peg.
4/ MSCI, EMBI+, S&P/IFCG Composite, and S&P/IFCG Frontier Composite.
5/ Less than 10 percent of broad money and of domestic public debt are denominated in foreign currency and the stock of private nonguaranteeed external debt is less than 10 percent of total debt.

- **Considerations related to the nature of shocks to the economy suggest a moderate case against a peg principally on account of relatively small monetary shocks in relation to real supply shocks.** Husain (2004) captures real shocks to an economy by the variability of its terms of trade. In the Moroccan economy, shocks come mainly from variations in agricultural output rather than variations in terms of trade. Thus, real GDP volatility may be a better proxy for real shocks. Furthermore, in the Mundell-Fleming framework, the ability of fixed exchange rates to offset the impact of demand shocks is based on a positive correlation between output and imports.[46] This may not be the case in countries such as Morocco where output volatility mostly originates from supply shocks in the agricultural sector rather than demand shocks coming from terms of trade. When GDP expands in a good crop year, food imports tend to diminish. This type of shocks may affect the correlation between GDP and imports. In Morocco, it was -0.3 in the period 1990–2004, 0.02 in 1980–2004.

[46] A shock that expands output will increase imports, and therefore lower the level of reserves. As a consequence, there will be a monetary contraction, which will mitigate output growth.

- **Given the inflation history of Morocco, an exchange rate peg as an anchor to disinflate may not be needed.** It is worth noting in this context, however, that the pegged exchange rate regime has contributed to Morocco's low inflation record.

- **The absence of effects associated with the fear of floating does not argue for a peg.** In particular, the low degrees of dollarization, open positions in the banking sector, and correlation of the consumer price index with the nominal effective exchange rate would not make Morocco a candidate for a peg. Specifically, they imply that were Morocco to choose a flexible exchange rate regime on the basis of other criteria, fear of floating effects would not prevent the authorities from doing so.

70. **In light of the above considerations identified in the literature, it is difficult to make a case against a peg based on historical evidence on the structure of the economy.** Indeed, the current exchange rate peg has served Morocco well in terms of maintaining low inflation and a comfortable balance of payments position. The future regime choice, however, will depend on which considerations are likely to become more important in light of the authorities policy intentions and Morocco's economic challenges.

D. Forward-Looking Considerations and Exchange Rate Policy Recommendation

71. **This section argues that, based on forward-looking considerations derived from the authorities' current and prospective policies, a move to a flexible exchange rate would be appropriate for Morocco.** Under the current regime, there is a greater potential for an exchange rate misalignment in the future, assuming less than full price flexibility in the economy. This is because: (a) increasing trade liberalization and diversification may imply a depreciation of the equilibrium real exchange rate, especially in the short-run; (b) capital account liberalization would make interest rate differentials a more significant determinant of the equilibrium real exchange rate; and (c) structural reforms which could lead to a real exchange rate appreciation through Balassa-Samuelson effects. In addition, a flexible exchange rate would facilitate adjustment to shocks, would avoid giving an exchange rate guarantee to economic agents, and would provide monetary independence as the authorities further liberalize the capital account.

Trade liberalization and diversification

72. **Increased trade diversification and liberalization will weaken the case in favor of a pegged exchange rate regime.** As noted above, currently the main consideration that points to a case for a peg is the trade pattern concentration with the EU. While the share of trade with the EU is expected to remain high in the near future, it is expected to decline somewhat as a result of the recent free trade agreements between Morocco and the United States and various Mediterranean countries. Furthermore, Moroccan exporters are increasingly facing competition in the Euro area from countries whose currency is not pegged to the euro, Asian countries in particular. Finally, the likely depreciation pressures resulting from ongoing trade liberalization on the equilibrium real exchange rate and potential delays in related productivity gains militate in favor of exchange rate flexibility. In the short run, as Moroccan firms face greater competition at home, Morocco's

competitiveness and trade balance will deteriorate under the current pegged regime. A flexible exchange rate, by accommodating the depreciation pressures, could then help Moroccan firms adjust better under these competitive pressures.[47]

Gradual liberalization of the capital account

73. **The effect on the exchange rate of the authorities' plan to gradually liberalize the capital account is uncertain.** With the improvement in the business environment that comes along with successful structural reforms, there could be more foreign direct investment inflows (including by Moroccans residing abroad) and foreign financing for Moroccan firms. However, there would also be portfolio investment outflows as capital account restrictions for residents are eased. The financial sector would probably take advantage of new investment opportunities abroad, a move that will contribute to improve the quality of their portfolio. As a result, pressures on the exchange rate could go in both directions. In such an environment, a flexible exchange rate would help prevent undue reliance by economic agents on an implicit exchange rate guarantee, and hence reduce the scope for sudden reversals of capital flows. Capital account liberalization also makes interest rate differentials a more significant determinant of the equilibrium exchange rate, adding uncertainty in the short to medium run to the level of the equilibrium real exchange rate.

Structural reforms and the Balassa-Samuelson effect

74. **The future path of the real exchange rate will also depend on how structural reforms affect Morocco's growth trajectory.** Morocco is undertaking broad-based market-oriented reforms in order to accelerate growth and reduce unemployment and poverty. The closer integration into the global economy described above is a key pillar of this strategy. Other structural measures have been taken or are under consideration in the areas of public enterprises, the judiciary system, labor markets and the financial system. They all aim at creating a business friendly environment, a requirement for enhancing the economy's productivity and competitiveness, and ultimately for raising the country's future growth performance and making it less dependent on weather vagaries. Given that Morocco's main trading partners are industrialized countries, with which the labor productivity gap is substantial, successful structural reforms would raise Morocco's productivity growth rate above those of its partners, in particular in the tradable goods sector. The resulting productivity growth differential across the tradable and nontradable goods sectors of the

[47] Empirical evidence on the impact of an increase in trade integration on the probability of exiting to more flexible regimes is mixed. Duttagupta and Okter-Robe (2003) find a significant positive probability, while Detragiache and others (2005) do not.

Moroccan economy would tend to push up the overall price level and generate a real exchange rate appreciation as a result of the so-called Balassa-Samuelson effect.[48]

75. **If the Balassa-Samuelson effect were to become important in Morocco, a more flexible exchange rate regime would help contain associated inflationary pressures.** To the extent that strong productivity growth in the tradable goods sector generates appreciation pressures on the nominal exchange rate, a flexible exchange rate regime would result in lower price inflation than under a peg.

76. **In light of these forward-looking considerations, a more flexible exchange rate regime would better serve Morocco.** Moreover, the lack of evidence of a strong real exchange rate misalignment implies that an exit from the peg would likely be orderly.

77. **Forward looking considerations and the findings in the literature on exchange rate regime performance provide the following lessons for the authorities:**

- If the central bank has the necessary autonomy to maintain price stability, Morocco should invest in learning to float.

- Sequencing of a transition to exchange rate flexibility would require developing liquid markets to limit exchange rate and interest rate volatilities.

- Full capital account liberalization would need to be preceded by a flexible exchange rate, adequate regulatory and supervisory frameworks to monitor risks stemming from capital flows, and market participants' capacity to manage exchange and interest rate risks.

E. Desirable Degree of Flexibility

78. **There is a range of exchange rate regime options a country can choose from in exiting from a peg, and the pace of exit and regime choice should be determined by the country's initial conditions.** Dattugupta and others (2004) characterize a gradual move to a float as one that could involve shifting from a fixed exchange rate against a single currency to a fixed or crawling peg against a basket of currencies, to an exchange rate band (horizontal or crawling) with incremental widening of bandwidths. Countries that rapidly exited from pegs did so under pressure and have usually been high inflation countries experiencing severe balance of payments crises. In contrast, countries that have orderly and gradually exited from pegs typically transitioned first to crawling pegs, second to crawling bands, third

[48] The Balassa-Samuelson effect basically says that if productivity growth is higher in the tradable sector than in the nontradable one, then interlinkages of wages across industries will tend to push wages up throughout the economy. As a consequence, prices in the nontradable sector, where productivity growth is low, will rise relative to those in the tradable sector, generating a real exchange rate appreciation (Appendix IV).

to managed floats and some at the end to a floating exchange rate regime. This sequence of transition was mainly dictated by disinflation objectives since the exchange rate anchor under a crawling peg or crawling band helps anchor inflationary expectations. In addition, the gradual adjustment of the exchange rate under the latter regimes in response to past or expected inflation differentials with trading partners helps avoid a real exchange rate appreciation and loss of competitiveness. Examples of countries that transitioned from fixed exchange rates to crawling pegs or bands for these reasons include Chile, Hungary, Israel, and Poland.

79. **Morocco has already achieved price stability, a transition to a crawling peg or a crawling band with a central rate for disinflation objectives does not apply.** Price stability is also likely to be maintained in the future since the fiscal deficit is exclusively financed by the issuance of debt securities and BAM does not finance the treasury. In a low inflation environment, a crawling peg or band fixed to a basket or a single currency and adjusted depending on inflation differentials with trading partners would essentially be a pegged exchanged rate regime. The arguments in favor or against such a regime discussed earlier would apply (Appendix V). The choice that Morocco faces is therefore between maintaining the existing exchange rate regime or starting a transition to a floating exchange rate regime.

F. Exiting from the Exchange Rate Peg

80. **An exit from the peg in Morocco is likely to be orderly because of its strong external position, low inflation, and the absence of strong indications of exchange rate misalignment.** The fact that the exchange rate does not appear misaligned implies that an exit from the peg would not result in a trend movement of the exchange rate. Furthermore, the external position is relatively strong and foreign exchange reserves cover the totality of public external debt indicating that a balance of payments crisis is unlikely. The absence of exposures that give rise to fear of floating effects also facilitate the transition to a more flexible exchange rate regime. Indeed, banks hold limited open foreign exchange positions and public debt is mostly in domestic currency.[49] Morocco would therefore be exiting from the peg in a position of strength. Nevertheless, a gradual exit to a floating exchange rate would be appropriate given the fact that financial markets are still at an early stage of development where market illiquidity can give rise to significant exchange and interest rate volatility that could have adverse real impacts on the economy.

81. **Accordingly, Morocco should be able to transition to a managed float with a horizontal band that would guide foreign exchange intervention when the peg is abandoned.** Interventions in the foreign exchange market would be guided by reserve accumulation targets and by the estimated range of the equilibrium exchange rate.[50] The

[49] Total external debt was 30.8 percent of GDP at end-2004, of which 26 percent of GDP in public and publicly guaranteed debt. Central government debt in foreign currency was only 15.9 percent of GDP.

[50] This implies the development of an intervention policy that also takes into account the pattern of foreign exchange flows. BAM already forecasts foreign exchange flows as a part of its liquidity forecasting framework.

absence of foreign exchange related balance sheet vulnerabilities should allow for a wider band of exchange rate fluctuation than would otherwise be the case. A wider band would provide the two-way risk necessary to foster market liquidity and the development of hedging instruments which would help reduce market volatility and limit BAM's need to intervene to reduce market volatility. BAM will, however, need to gradually move away from targeting an exchange rate value to avoid market perception of an exchange rate guarantee as capital account liberalization proceeds.

82. **Exiting from the peg and learning to float will require setting up a monetary framework that would maintain price stability when the exchange rate is no longer the main anchor for prices.** The new central bank law gives autonomy to BAM and sets price stability as its primary goal. In practice, specific targets that make price stability operational can be inflation targets, monetary aggregate targets, or the maintenance of a fixed exchange rate. In the current context of a fixed exchange rate regime, BAM in effect has instrument autonomy to maintain the peg but does not have goal or target autonomy with respect to inflation (IMF, 1998). The current monetary framework will, therefore, need to be reformed if BAM is to learn to float.

83. **The June 2004 IMF technical assistance[51] mission found that BAM had the operational capabilities to fully rely on money market operations to conduct monetary policy were it to exit from the peg. BAM's money market operations are calibrated to target the interbank interest rate on the basis of daily liquidity forecasts.** Standing facilities provide a corridor for interbank interest rates and BAM relies on remunerated reserve requirements to sterilize excess liquidity stemming from large balance of payments surpluses experienced in recent years. Coordination of BAM's monetary operations and the treasury's debt management has also contributed to managing excess liquidity. The new central bank law will, in addition, provide BAM with the possibility of issuing its own bills to manage liquidity.

84. **The June 2004 technical assistance mission made recommendations that would enhance BAM's analytical capabilities to conduct monetary policy as more exchange rate flexibility is allowed.** Initially, it was recommended that BAM use a monetary aggregate as a reference target to anchor inflation, and develop inflation forecasts that would guide its policy decisions. The money target recommendation was motivated by the finding that inflation was more closely related to credit growth. The technical assistance mission also recommended that BAM develop equilibrium exchange rate estimates that would provide a fluctuation margin around which central bank interventions would take place. The fluctuation band would allow BAM to use the exchange rate as a complementary rather than a primary anchor until it gains sufficient experience in conducting monetary policy as the exclusive means of ensuring price stability. Sound and supportive macroeconomic and income policies would therefore be essential to anchor domestic demand and BAM will need to make clear in its communications that the price stability objective will remain the priority. As capital

[51] "Strengthening the Strategic and Operational Framework for Monetary Policy," MFD, June 2004.

account liberalization becomes more advanced, however, the exchange rate objective will need to be abandoned if BAM is to retain monetary independence.

85. **The recommended reference monetary target would provide a transitional framework for the pursuit of price stability until conditions for inflation targeting are in place.** Countries that have exited from pegs to floating regimes have only gradually moved to inflation targeting because such a move requires a developed financial market and a reliable methodology for forecasting inflation which are not yet in place in Morocco (Box 3). This strategy is consistent with the experience of several countries, including Mexico and Uruguay which adopted money aggregate targets prior to moving to formal inflation targeting. Mexico has adopted inflation targeting since 2001 and has kept a measure of base money as an operating target. Base money as an operating target has the advantage of a direct relationship with a monetary reference target. The monetary reference target itself can be a band to accommodate uncertainties in the money multiplier and velocity, and provide flexibility to BAM's monetary operations.

Box 3. Initial Conditions for Inflation Targeting

- **Objective of monetary policy.** Inflation should be the primary objective of monetary policy, and the central bank should be accountable in meeting this objective. The central bank law should ensure that price stability is the primary objective of monetary policy, and the central bank should have sufficient autonomy to set monetary instruments accordingly and be transparent in policy formulation and implementation; *With the new central bank law, Morocco will meet this condition.*

- **Macroeconomic conditions.** There is a need to ensure that the inflation target will not be subordinated to other objectives. Monetary policy should not be dominated by fiscal priorities (absence of fiscal dominance), and fiscal policy and public debt management activities should be coordinated in support of the inflation target. The country should also have sufficient stability in its external position to enable monetary policy to focus on achieving the inflation target. *Morocco broadly meets this condition but fiscal consolidation to reduce the fiscal deficit and public debt is needed*.

- **Monetary policy tools**. The financial system should be developed and stable so that monetary policy is not sidetracked by concerns about the health of financial institutions. Markets should be sufficiently well developed (money, foreign exchange, debt and equity markets) to enable monetary policy to be implemented using market-based instruments and transmission mechanisms to be diversified and efficient; *Morocco has not yet met these conditions as financial markets need to be further developed.*

- **Inflation forecasting**. The central bank needs the proper policy tools to be in a position to influence inflation, on the basis of a reasonable understanding of the links between the stance of policy and inflation and be able to forecast inflation. *Morocco has not yet met this condition. BAM is developing the necessary analytical capabilities.*

Source: IMF (2002).

86. **To minimize market volatility when active monetary policy is conducted in the context of a more flexible exchange rate, efforts will need to be made to further deepen markets.** In this regard, the authorities should implement recommendations of the IMF's June 2004 technical assistance report on the money, foreign exchange, and government securities markets. The report noted that the government securities market meets international practices and the treasury department adheres to best practices in debt management policies. To help deepen the foreign exchange markets, the report recommended that the surrender requirement be eliminated and that banks be allowed to manage their foreign exchange open positions more flexibly. In addition to these, a wider fluctuation band for the dirham, resulting from a transition to a more flexible exchange rate regime, could help market activity. In such a context, the market could be informed on the methodology the central bank uses to determine the dirham's fluctuation band to enhance transparency, an essential element of market liquidity.

87. **While greater exchange rate and interest rate flexibility provides the necessary incentives for economic agents to manage the associated risks, a proper regulatory and supervisory framework is essential to contain risks before floating the exchange rate.** Adequate bank supervision and bank risk management, in particular, also translate into proper risk management at the corporate level. Open position regulations are in place in Morocco. Commercial banks, which represent the bulk of the system, generally hold long open positions which represent a small percentage of their capital. The FSAP also found that most banks were not in a position to monitor their interest rate risk exposures since they were unable to provide reliable information on their asset-liability re-pricing maturity profile. Banking supervision will be improved with the promulgation of the new banking law, expected by end-2005, and with reforms of the regulatory framework that are already underway with the assistance of an IMF long term resident advisor.

88. **Capital account liberalization will also need to proceed cautiously until the financial sector is adequately prepared to manage the risks related to capital flows and other preconditions are met.** Volatile capital flows, especially short-term flows, can exacerbate exchange and interest rate volatilities in illiquid markets. Capital flows are essentially free for nonresidents, but some restrictions, which prevent short term speculative flows remain. More specifically, corporations and banks may only borrow abroad to finance corporate investments or foreign trade, and banks need BAM's authorization to lend in foreign currency to residents and may be required to close their open foreign exchange positions if they incur losses greater than 3 percent on open positions. These restrictions moderate banks' possibilities to use foreign currency funding for lending and de facto contribute to restricting short term speculative capital flows. Effective liberalization of short term capital flows for nonresidents through banks should not be allowed until preconditions are in place, in particular a flexible exchange rate regime. Liberalizing capital flows for residents will also need to wait until the banking system is strengthened to better withstand foreign competition, existing fiscal imbalances are corrected, and the exchange rate is floated.

G. Conclusions and Recommendations

89. This chapter examined the exchange rate regime options for Morocco in light of the historical performance of the existing regime, the structure of the economy, and the authorities' current and intended policies. The chapter concludes that there are no signs of misalignment of the dirham and that the current fixed exchange rate regime has served Morocco well by contributing to maintaining price stability. After reviewing theoretical considerations in exchange rate regime choice, the chapter finds that the main consideration that points to a continuation of the exchange rate peg is the trade pattern concentration with the European Union. However, the limited correlation of Morocco's economic cycle with that of the EU and the limited labor mobility between the two economies weakens the case for a peg. A flexible exchange rate in such a context would allow Morocco to adjust to shocks to its economy.

90. The case for a flexible exchange rate regime is further strengthened by the authorities' current and intended policies. Morocco is undergoing trade liberalization, the immediate effect of which is a depreciation of the equilibrium exchange rate. As the economy opens up and is more vulnerable to external shocks, a flexible exchange rate would facilitate adjustment to these shocks. Morocco is also undergoing structural reforms to render the economy more efficient, the ultimate effect of which could be an appreciation of the equilibrium exchange rate. Furthermore, the authorities' intention to liberalize the capital account overtime will require a flexible exchange rate if Morocco wishes to maintain monetary autonomy. A flexible exchange rate would also be desirable under an open capital account to avoid providing an undue exchange rate guarantee to economic agents. In sum, forward-looking considerations militate in favor of Morocco moving gradually to a floating exchange rate regime.

91. The chapter argues that Morocco could initially transition to an exchange rate band by putting in place a monetary reference target to replace the exchange rate as the primary nominal anchor. The recommendation is based on the fact that Morocco has already achieved price stability and has the necessary institutional capacity to pursue a monetary reference target with base money as an operating target. Deepening of money and foreign exchange markets, development of hedging instruments, and strengthening of risk management capacities are also essential to reduce foreign exchange and interest volatilities that could have adverse impacts on the economy. Capital account liberalization will need to wait until the banking sector is further strengthened, fiscal consolidation is achieved, and the exchange rate is floated.

Table 2. Morocco: Selected Economic and Financial Indicators, 1990, 1995–2004
Quota: SDR 588.20 million
Population: 29.8 million
Per capita income: US$ 1,677 (2004)

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	Est. 2004
					(Annual percent change; unless otherwise indicated)						
Production and income											
Nominal GDP	9.7	0.9	13.4	-0.3	8.1	0.5	2.5	8.2	3.8	5.5	5.8
Real GDP	4.0	-6.6	12.2	-2.2	7.7	-0.1	1.0	6.3	3.2	5.5	4.2
Real non-agricultural GDP	6.3	2.3	3.6	3.2	4.4	3.2	3.6	3.6	2.8	3.5	4.7
GDP deflator	5.5	8.0	1.0	2.0	0.4	0.5	1.5	1.8	0.6	-0.1	1.5
Consumer price index (CPI), average	6.7	6.1	3.0	1.0	2.7	0.7	1.9	0.6	2.8	1.2	1.5
					(In billions of U.S. dollars; unless otherwise indicated)						
External sector											
Exports of goods, f.o.b.	5.0	6.9	6.9	7.0	7.1	7.5	7.4	7.1	7.8	8.8	9.7
Exports of goods, f.o.b. (percent change)	28.7	24.0	0.2	2.2	1.5	5.1	-1.2	-3.7	9.8	11.8	11.2
Imports of goods, f.o.b.	6.9	9.4	9.1	8.9	9.5	10.0	10.7	10.2	10.9	13.1	16.2
Imports of goods, f.o.b. (percent change)	27.6	22.3	-2.9	-1.9	6.3	5.2	7.0	-4.6	7.2	20.1	23.9
Net services and income	-1.0	-1.0	-0.3	-0.4	-0.2	0.1	0.3	1.1	1.2	1.8	2.7
Net transfers	2.3	2.3	2.5	2.2	2.3	2.1	2.5	3.6	3.3	4.1	4.9
Current account (in percent of GDP)	-2.8	-3.6	0.1	-0.3	-0.4	-0.5	-1.4	4.8	4.1	3.6	2.2
Overall balance (deficit -)	1.5	-1.0	0.3	0.6	0.2	1.6	-0.4	3.8	0.6	1.6	1.8
					(In percent of GDP)						
Central government											
Revenue, excluding grants and privatization	24.0	23.9	23.5	25.3	25.5	27.5	26.2	25.0	24.7	24.5	25.1
Total expenditure (including *Fonds Hassan II*)	27.5	29.8	26.9	29.6	30.5	30.5	32.4	31.1	29.9	30.3	30.9
Overall balance 1/	-3.5	-5.6	-2.8	-3.4	-4.6	-1.9	-6.4	-5.7	-4.7	-5.3	-4.9
Privatization and GSM receipts	0.0	0.4	0.7	1.6	0.1	3.2	0.0	6.1	0.2	2.9	2.3
Overall balance, incl. privatization	-3.5	-5.2	-2.1	-1.9	-4.5	1.3	-6.4	0.4	-4.5	-2.5	-2.6
					(Annual percent change; unless otherwise indicated)						
Money and credit											
Broad money	19.0	7.7	4.8	9.0	5.8	10.3	8.4	14.2	6.3	8.6	7.5
Interest rate (Avg, money market rate, in percent)	...	10.06	8.42	7.89	6.3	5.6	5.4	4.4	3.0	3.2	2.4
Official reserves											
Gross official reserves (in billions of US$, end-period)	2.1	3.8	4.0	4.2	4.6	5.7	4.8	8.4	10.1	13.9	16.3
In months of imports of goods and services, c.i.f.	3.0	4.0	4.4	4.7	4.8	5.7	4.6	8.2	9.1	10.4	10.0
	...										
Debt (short, medium and long term)											
Total external debt (in billions of US$)	20.8	22.9	21.7	19.5	20.6	19.8	18.0	15.9	15.7	16.8	16.6
Total external debt (in percent of GDP)	80.4	69.4	59.3	58.3	57.5	56.1	53.9	47.8	40.9	35.1	30.8
Domestic government debt (in percent of GDP)	35.5	43.3	41.0	44.8	44.6	45.6	47.3	45.8	48.1	50.1	51.0
Total government debt (in percent of GDP)	89.1	90.6	82.1	83.0	80.9	81.3	81.5	74.7	71.4	68.5	65.8
Memorandum items:											
GDP at current prices (in billions of Dh)	212.8	281.7	319.3	318.3	344.0	345.6	354.2	383.2	397.8	419.5	443.7
GDP at current prices (in billions of US$)	25.8	33.0	36.6	33.4	35.8	35.2	33.3	33.9	36.1	43.8	50.0
Exchange rate: dirham/US$ (average period)	8.24	8.54	8.72	9.53	9.60	9.80	10.63	11.3	11.0	9.6	8.9
Real effective exchange rate (appreciation +)	-5.7	3.2	0.8	0.9	2.4	1.0	2.8	-4.1	-0.3	-1.3	-0.6
Terms of trade (deterioration -)	-1.9	10.5	1.6	0.5	11.7	-5.9	-7.7	7.6	-7.3	5.7	-10.8
Unemployment rate (in percent)	...	...	...	...	...	14.5	13.7	12.8	12.5	11.4	10.8
Urban	...	...	...	...	...	22.9	21.5	20.3	18.0	19.3	18.4
Rural	...	...	...	...	...	5.2	5.2	4.2	6.2	3.4	3.1

Sources: Data provided by the Moroccan authorities and Staff estimates
1/ Commitment basis including Fonds Hassan II

Table 3. Morocco: Direction of Trade, 1990, 1999–2004

	1990	1999	2000	2001	2002	2003	2004
			(In percent of total exports)				
Exports, f.o.b							
European Union	61.7	67.5	75.3	73.2	73.8	76.5	69.4
France	29.2	33.0	33.5	33.3	33.7	34.6	25.4
Spain	8.5	8.1	13.0	14.5	15.7	17.7	19.1
Germany	4.9	6.0	5.0	4.6	4.2	3.9	4.4
Italy	6.4	4.4	7.1	5.7	5.4	5.1	4.9
United States	1.8	4.6	3.4	3.8	3.1	2.8	4.7
Developing countries	24.6	16.7	15.9	17.5	17.1	16.3	21.5
Other	12.0	11.3	5.4	5.5	6.0	4.4	4.4
			(In percent of total imports)				
Imports, c.i.f							
European Union	51.2	65.7	58.7	55.3	57.5	59.8	63.1
France	20.0	29.0	24.0	24.1	20.5	20.6	20.3
Spain	7.3	10.2	9.9	9.2	11.6	12.4	14.9
Germany	5.5	5.4	4.9	5.0	5.3	5.2	7.0
Italy	5.9	5.9	4.7	5.0	5.8	7.1	6.7
United States	5.5	4.8	5.6	3.6	4.3	4.1	3.0
Developing countries	29.8	16.3	31.3	36.9	34.3	32.2	31.1
Other	13.5	13.2	4.4	4.2	3.9	3.9	2.8

Sources: Moroccan authorities; and IMF staff calculations.

Table 4. Morocco: Balance of Payments, 1999–2004
(In percent of GDP)

	1999	2000	2001	2002	2003	Est. 2004
Current account	-0.5	-1.4	4.8	4.1	3.6	2.2
Trade balance	-6.9	-9.7	-8.9	-8.5	-9.9	-13.0
Exports	21.3	22.3	21.1	21.7	20.0	19.5
Imports	-28.2	-32.0	-30.0	-30.2	-29.9	-32.4
Food products	-3.3	-4.0	-4.0	-3.8	-2.7	-3.1
Petroleum	-2.6	-4.2	-3.8	-3.2	-2.2	-3.3
Services	3.2	3.4	5.6	5.4	6.0	6.8
Credit	8.8	9.1	11.9	12.1	12.5	13.6
of which tourism receipts	5.5	6.1	7.6	7.3	7.4	7.8
Debit	-5.7	-5.7	-6.2	-6.7	-6.5	-6.9
Income	-2.8	-2.6	-2.5	-2.0	-1.8	-1.3
Transfers	6.1	7.4	10.5	9.2	9.4	9.7
of which receipts from MRE	5.5	6.5	9.6	8.0	8.2	8.4
Capital and finanical account	5.5	-0.1	6.2	-1.6	0.8	1.9
Capital transfers	0.7	0.0	0.3	0.2	0.0	0.0
Financial balance	4.8	-0.1	5.9	-1.8	0.9	2.0
Direct investment	2.4	1.1	8.0	1.3	5.3	1.6
Portfolio investment	0.0	0.1	0.0	0.0	0.0	1.1
Other	2.4	-1.3	-2.1	-3.0	-4.4	-0.7
Public sector loans	-1.5	-2.5	-3.2	-3.6	-2.6	-2.3
Private sector loans	2.3	0.4	0.0	0.0	0.0	0.0
Other	1.6	0.9	1.1	0.6	-1.8	1.6
Reserve accumulation	-4.6	1.2	-11.3	-1.8	-3.8	-3.7
Errors and amoissions	-0.4	0.3	0.4	-0.8	-0.7	-0.5
Memorandum Items						
Volume of exports of g&s (percent change)	11.4	3.2	13.9	8.4	-3.2	8.5
Volume of imports of g&s (percent change)	5.1	3.3	11.9	2.1	4.8	5.6
Terms of trade (percentage change)	-5.9	-7.7	7.6	-7.3	5.7	-10.8
Gross official reserves (millions of US dollars) 1/	5,701	4,796	8,431	10,107	13,858	16,346
(months of imports of g&s)	6	4.6	8.2	9.1	10.4	10.0
External public & pub. guar. debt (percent of GDP)	52	49.1	42.2	36.3	30.1	26.0
Debt service (in percent of exports of g,s & worker remit.)	21	20.1	16.3	16.4	18.0	12.8

Sources: Moroccan Authorities
1/ Excluding the reserve position in the Fund, including valuation adjustments.

Table 5. Morocco: Chronology of Exchange Rate Arrangements, 1924–2004

Date	Calssification : Primary/Secondary/Tertiary	Comments
December 30, 1924–1939	Peg to French franc	Capital controls are introduced in the Franc- Zone
November 1942–December 6, 1944	Peg to UK pound and US dollar	
December 6, 1944–December 1948	Peg to French franc/ Freely falling	Reteurn to Franc Zone: Freely falling since January 1945
January 1949–October 17, 1959	Peg to French franc	
October 17, 1959–May 17, 1973	Peg to French franc	The Dirham replaced the Moroccan franc
May 17, 1973–December 1985	Moving band around French franc	+/- 2 percent band. Officially pegged to a basket of currencies. Dual rates, parallel market premia is trivial.
January 1986–January 1, 1999	Moving band around French franc	+/- 2 percent band. Officially pegged to a basket of currencies 1/.
January 1, 1999–	Moving band around euro 1/	+/- 2 percent band. Officially pegged to a basket of currencies 2/.

Source: Reinhart and Rogoff (2004)

1/ In the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), Morocco's exchange rate regime is classified as a "Conventional Pegged Arrangement."

2/ The reference currencies are the French franc (before end-2001), the U.S. dollar, and the Euro.

A Summary of Exchange Arrangements (Position as of End-2004)

Exchange rate structure and market. The exchange rate is pegged to an undisclosed basket of currencies dominated by the Euro. BAM intervenes in the market by continuously setting buying and selling rates based on the basket of currencies of the peg. Banks may provide forward contracts for commercial and financial operations for up to 12 months.

Foreign currency accounts. *Residents* are allowed to open: *(a) foreign currency accounts* which may be credited with transfers from abroad or from a domestic bank in accordance with foreign exchange regulations. Residents exporters are allowed to open these accounts and keep up to 20 percent of their foreign exchange receipts. Others must obtain authorization. Authorized debits include purchases of foreign currency denominated government debt, purchases of dirhams, or transfers to convertible dirham accounts, and transfers abroad. *(b) dirham accounts convertible into foreign currency* may be open by resident foreign nationals (see below). *Nonresidents* (foreign nationals and Moroccans residing abroad) are allowed to open: *(a) foreign currency accounts.* These accounts are regulated by provisions applicable to resident foreign nationals. They can be credited with transfers from abroad or from a domestic bank with authorization. Authorized debits include transfers abroad, subscriptions in foreign currency to government paper, or transfers to convertible dirham accounts.(b) *dirham accounts convertible into foreign currency*. These accounts are regulated by the provisions applicable to convertible dirham accounts of residents foreign nationals. They can be credited with the proceeds of the sale of foreign currency. Authorized debits include purchase of foreign exchange, dirham payments, and transfers to term deposits in convertible dirham. Nonresident foreign nationals not entitled to maintain convertible dirham accounts may open (c) forward convertible accounts. Funds on these accounts may be transferred within maximum periods of four years in annual installments of 25 percent, and may be used without authorization to settle dirham transactions.

Capital transactions. Nonresidents may purchase shares of a participating nature and foreign direct investment inflows are free. The purchase or issuance of securities (shares, bonds, bills etc.) abroad by residents is subject to authorization. Outward direct investments are subject to authorization. Corporations may obtain financial credits from nonresidents, provided the proceeds are used to finance investment or foreign trade.

Provisions specific to financial institutions: Commercial banks may place foreign currency with correspondents abroad, purchase sovereign bonds and securities issued by international financial institutions, and borrow abroad only to finance foreign trade or investment operations. Bank loans or purchase of securities domestically in foreign currency and loans to nonresidents are subject to authorization. Convertible and dirham deposits are excluded from reserve requirements. All deposits are taken into account in the calculation of liquid asset requirements. There are no special provisions applicable to institutional investors which are not allowed to purchase assets abroad.

Countries Included in the Husain (2004) Paper

Australia	Lebanon
Bolivia	Malaysia
Botswana	Mexico
Brazil	Morocco
Canada	Nepal
Chile	Netherlands
China, P.R.: Hong Kong	Nigeria
China, P.R.: Mainland	Oman
Czech Republic	Pakistan
Djibouti	Peru
Egypt	Philippines
Estonia	Poland
France	Qatar
Georgia	Russia
Ghana	Saudi Arabia
Greece	Senegal
Hungary	Singapore
India	Spain
Indonesia	Sri Lanka
Ireland	Thailand
Italy	Tunisia
Kazakhstan	Turkey
Kenya	Uganda
Korea	Ukraine
Kyrgyz Republic	Venezuela, Rep. Bol.
Latvia	

A MODEL OF BALANCE OF PAYMENTS EQUILIBRIUM EXCHANGE RATE (BPEER)[52]

Description of the Model

In the BPEER model, the equilibrium exchange rate is defined as the rate that is consistent with BOP equilibrium. The model therefore relies on the BOP identity. The sum of the current account balance (*ca*), the capital account balance (*ka*), and a change in the foreign reserves (*rez*) equal to zero, that is:

$$ca_t + ka_t - \Delta rez_t = 0 \quad (5)$$

In equation), the variables are in percent of GDP. The current account balance is defined as the sum of net trade (*nt*), including services, and interest payments on foreign assets (*nfa*):[53]

$$ca_t = nt_t + i_t^{\oplus} nfa_t \quad (6)$$

where $i_t^{\oplus}$ stands for nominal interest on net foreign assets. We have assumed that transfers are constant in percent of GDP. Net trade depends on the level of real effective exchange rate (q), internal demand (y) and external demand (y^*):

$$nt_t = -\alpha_1(q_t - \alpha_0) - \alpha_2 y_t + \alpha_3 y_t^* + \varepsilon_{1,t} \quad (7)$$

Where $\alpha_1, \alpha_2, \alpha_3 > 0$ are respectively the elasticities of net trade with respect to the exchange rate, domestic demand and foreign demand. An appreciation (increase) of the exchange rate of 1 percent reduces net trade by α_1 percent of GDP. A real appreciation is expected to make a country loose in competitiveness, and therefore reduce its exports. Similarly, an increase in internal demand by one percent reduces it by α_2 percent of GDP. An increase in internal demand boost demand for all goods and services, including foreign ones. Therefore, it tends to raise imports. An increase in external demand by one percent raises net trade by α_3 percent of GDP. Foreign demand is expected to boost exports. Using equations (5)–(7) it follows that

$$-\alpha_1(q_t - \alpha_0) - \alpha_2 y_t + \alpha_3 y_t^* + i_t^{\oplus} nfa_t + (ka_t - \Delta rez_t) = -\varepsilon_{1,t} \quad (8)$$

Which then implies

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[52] The model presented here is similar to Rubaszek (2004).

[53] One could explicitly add remittances as a determinant of the current account. However, it should be noted that remittances to Morocco seem to be mostly driven by output in Morocco and output in the remitters' countries of residence (see Bouhga-Hagbe (2004)). Since the estimated equation below includes both a proxy of Morocco and foreign countries' output, a potential effect of remittances, would be captured in the estimated model through the foreign assets movements.

$$q_t = \alpha_0 - \frac{\alpha_2}{\alpha_1} y_t + \frac{\alpha_3}{\alpha_1} y_t^* + \frac{1}{\alpha_1} i_t^{\oplus} nfa_t + \frac{1}{\alpha_1}(ka_t - \Delta rez_t) + \varepsilon_t \qquad (9)$$

Where

$$\varepsilon_t = \frac{\varepsilon_{1,t}}{\alpha_1}$$

is assumed to be normally distributed.

Therefore, in this BPEER model, the equilibrium level of real exchange rate is permanently influenced by internal demand, foreign demand, interest on net foreign assets and capital account flows, excluding reserve assets accumulation.

Various factors can influence capital mobility.[54] In Morocco, the capital and financial account being relatively closed, flows are mostly driven by government transactions, and not interest rates differential. Holding the current account balance constant, capital and financial account flows could by proxied by net foreign assets.

Econometric Application to Morocco

The data and estimation procedure

In this section, we discuss the data used for estimating the BPEER parameters. The data are for the period from the first quarter of 1980 to the fourth quarter of 2003. The real exchange rate used is the real effective exchange rate deflated by consumer prices. The internal (y) and external (y^*) demands were approximated by seasonally adjusted gross domestic product at constant prices in Morocco and in advanced economies weighted by trade exports.

The proxy for net foreign assets (*nfa*) were computed by taking Morocco's net foreign asset position at end 1979, and then adding the cumulative quarterly changes in net foreign assets from Morocco's monetary survey to get the value of the proxy at the end of subsequent quarters. As noted above, net foreign assets could also be seen as a proxy for capital and financial flows, holding the current account balance, that is foreign and domestic output constant.

The estimation procedure is conducted in four steps. First, the order of integration of the series is determined. Second, the existence of a cointegrating relation among the variables used in the BPEER model is verified. Third, the coefficients of the BPEER model are estimated.

[54] See for example Fernandez-Arias and Montiel (1996) for a further discussion.

Stationarity tests

The degree of variable integration was examined using the modified version of the Dickey-Fuller *t* test proposed by Elliott, Rothenberg and Stock (1996)[55] *REER* denotes the real effective exchange rate, *GDPMAR* real GDP in Morocco, *GDPADV* real GDP in advanced economies,[56] *NFA* net foreign assets. The symbol Δ denotes the first difference of the variables. The lag structure was chosen using the Schwartz information criteria. The maximum number of lags was set at 11. The results are presented in Table 6. All variables considered in the BPEER model seem to be integrated of order one.[57]

Testing for cointegration

The number of cointegrating vectors was tested (see Tables 10a, 10b, 11a and 11b) using Johansen's (1991) trace and max-eigenvalue tests. The tests indicate that there is one cointegrating vector at 1 percent level of significance. In order to calculate the test statistics, we estimated a vector error correction (VEC) model of the form:

$$\Delta x_t = \Gamma + \Pi x_{t-1} + \sum_{i=1}^{p} A_i \Delta x_{t-i} + D_t \qquad (10)$$

where x_t is the vector of endogenous variables:

$x_t = \left[q_t \quad y_t \quad y_t^* \quad nfa_t \right]$

The matrix Π is then decomposed into an adjustment $\alpha_{p\times r}$ and a cointegrating $\beta_{p\times r}$ matrices, that is

$\Pi = \alpha\beta'$

where *r* is the number of cointegrating relationships. D_t is an exogenous dummy variable that takes the value of 1 for the first and second quarter of 2001, and zero elsewhere. It is supposed to capture the sudden surge in remittances that occurred at the beginning of 2001. Including such a dummy considerably improves the performance of the model, as this phenomenon is unlikely to be explained by this model. Note that critical values used for both the trace and max-eigenvalue in table Johansen assume no exogenous series. However, these test still suggest that there are cointegration relations among the endogenous variables even when the exogenous dummy is removed.

[55] This test is more powerful when an unknown mean or trend is present (see Elliott, Rothenberg and Stock (1996)).

[56] Weighted by trade exports

[57] The degree of integration of the variables was not affected when the Akaike information criterion was used.

An estimate of the cointegrating vector is presented is presented in Table 12. The VEC was estimated using 9 lags[58] (p=9) (Table 13). Lag exclusion tests are presented in Table 15, and misspecification tests in Table 16). The multivariate LM statistics show that the residuals are not autocorrelated. The multivariate JB test rejects the hypothesis of normality of residuals. However, this rejection is due to excess kurtosis, which has less impact on properties of cointegration estimators, than if the skewness was considered a reason for the rejection.[59]

A Fully-Modified OLS (FMOLS) procedure proposed by Phillips-Hansen (1990) was also used. This procedure takes into account the endogeneity of variables and the autocorrelation of residuals. Monte Carlo simulations by Hargreaves (1994) suggest that the FMOLS dominates other univariates estimators in the case of small sample simulations. Estimates from FMOLS are also presented in Table 12. Note that for all these estimators the signs on the coefficients of internal and external demand are robust. However, the sign on net foreign assets varies with the estimator used, suggesting that the impact of net foreign assets on the BPEER is unclear, based on historical evidence. The economic interpretation of the results is further discussed below.

Estimation results

The estimation results of the BPEER model for Morocco are in line with a priori expectations.

- **There is a negative correlation between the real exchange rate and Morocco's output**. First, a real depreciation can lead to an increase in output. It enhances a country's competitiveness and can help boost its exports. There seems to be evidence that the real exchange rate affects Morocco's performances (Tables 9a and 9b). Second, an increase in output can also lead to real exchange rate depreciation. If an economy is subject to a positive supply shock, then domestic prices can go down, causing a real exchange rate depreciation. Indeed in Morocco, growth is still significantly influenced by supply shocks, especially agricultural performances. When the agricultural campaign is good, the growth rate is higher, but prices also go down. This probably contributes significantly to the negative correlation.

- **There is a positive correlation between the real exchange rate and foreign output**. This is consistent with the predictions of the BPEER model. However, even though foreign output, which boosts Morocco's exports, can lead to an appreciation of the real exchange rate, there could be other channels through which this correlation can be explained. The positive correlation between the real exchange rate and foreign output can also come from the fact that a depreciation of Morocco's trading partners' currencies boosts their economic performances.

[58] The table is available upon request. Note that the dummy turns out to be significant for the equation determining *nfa*, which is affected by the level of remittances to Morocco.

[59] See Paruolo (1997).

- **Net foreign assets may not have played any significant role in real exchange rate determination in the past.** Net foreign assets seem not to have significantly affected Morocco's long-run real exchange rate (Table 12). One should note however that even with a nominal peg regime, capital flows can affect the real exchange rate through Dutch-disease-types effects that would raise factor costs and ultimately prices.

There is no evidence that could suggest a real exchange rate misalignment in Morocco for the time being on the basis of the BPEER estimator.

Table 6. Stationarity Test (Elliott-Rothenberg-Stock DF-GLS Test) 1/

Variables	Included in regression	Lag 2/	Test statistic	1 percent critical value 3/	5 percent critical value 3/	Conclusion
In levels (logarithm)						
REER 4/	constant	1	-0.229	-2.589	-1.944	Unit root
REER 4/	constant, trend	1	-0.820	-3.591	-3.040	Unit root
REER 5/	constant	1	-0.080	-2.589	-1.944	Unit root
REER 5/	constant, trend	1	-0.758	-3.591	-3.040	Unit root
NFA	constant	0	1.667	-2.590	-1.944	Unit root
NFA	constant, trend	0	-1.061	-3.610	-3.056	Unit root
GDPMAR	constant	4	2.035	-2.591	-1.944	Unit root
GDPMAR	constant, trend	4	-2.598	-3.614	-3.059	Unit root
GDPADV	constant	5	-0.103	-2.590	-1.944	Unit root
GDPADV	constant, trend	5	-3.593	-3.603	-3.049	Unit root
In first difference in logarithm						
D(REER) 4/	constant	0	-6.761	-2.589	-1.944	Stationary
D(REER) 5/	constant	0	-7.065	-2.589	-1.944	Stationary
D(NFA)	constant	0	-7.912	-2.591	-1.944	Stationary
D(GDPMAR)	constant	3	-7.337	-2.591	-1.944	Stationary
D(GDPADV)	constant	5	-2.576	-2.590	-1.944	Stationary

Source: IMF staff calculations.

1/ The dataset covers the period from the first quarter of 1980 to the fourth quarter of 2003.
The test used is the one proposed by Elliot, Rothenberg and Stock (1996). The null hypothesis is that the variable has a unit root.
2/ The number of lags is selected using the Schwartz information criterion (see Schwarz (1978)). The maximum number of lags used is 11.
3/ For the regression equations without a linear trend, the critical values are from MacKinnon (1996).
For the regression equations with a linear trend, critrical values are from Elliott-Rothenberg-Stock (1996, Table 1).
4/ The real effective exchange rate index uses weights based on 1989–91 trade data.
5/ The real effective exchange rate index uses weights based on 1999–2001 trade data.

Table 7. Cointegration Trace Test: Exports, REER, and GDPADV 1/

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None	0.74	46.62	29.80	0.0003
At most 1	0.62	19.35	15.49	0.0124
At most 2	0.00019	0.0038	3.84	0.95

1/ The data frequency is annual and covers the period from 1980 to 2002.

The real effective exchange rate index uses weights based on 1989–91 trade data.

Trace test indicates 1 cointegrating eqn at the 0.01 level and 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level.

Table 8. Cointegration Eigenvalue Test: Exports, REER, and GDPADV 1/

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.
None	0.74	27.27	21.13	0.0060
At most 1	0.62	19.35	14.26	0.0072
At most 2	0.00019	0.0038	3.84	0.95

1/ The data frequency is annual and covers the period from 1980 to 2002.

The real effective exchange rate index is uses weights based on 1989–91 trade data.

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.01 level.

* denotes rejection of the hypothesis at the 0.05 level.

Table 9a. Estimating Long-Run Exports, Based on 1989–91 Trade Weights 1/

Dependent variable: exports	
REER 2/	-0.31 [-8.50]
GDPADV	1.80 [43.62]

1/ t-statistics are in brackets.
All regression equations include an unreported constant.
The data frequency is annual and covers the period from 1980 to 2002.
2/ The real effective exchange rate index is uses weights based on 1989–91 trade data.

Table 9b. Estimating Long-Run Exports, Based on 1999–2001 Trade Weights 1/

Dependent variable: exports	
REER 2/	-0.20 [-5.34]
GDPADV	1.72 [58.07]

1/ t-statistics are in brackets.
All regression equations include an unreported constant.
The data frequency is annual and covers the period from 1980 to 2002.
2/ The real effective exchange rate index uses weights based on 1999–2001 trade data.

Table 10a. Cointegration Trace Test: Balance of Payments Equilibrium Exchange Rate, Based on 1989–91 Trade Weights 1/

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None	0.29	58.71	47.86	0.0035
At most 1	0.24	29.86	29.80	0.0491
At most 2	0.075	7.39	15.49	0.53
At most 3	0.011	0.92	3.84	0.34

1/ The dataset covers the period from the first quarter of 1980 to the fourth quarter of 2003.
The real effective exchange rate index is uses weights based on 1989–91 trade data.
The vector autoregression includes 7 lags. A dummy is added to account for the surge in remittances and therefore net foreign assets that occurred in 2001.
Trace test indicates 1 cointegrating eqn at the 0.01 level and 2 cointegrating eqn(s) at the 0.05 level.

Table 10b. Cointegration Trace Test: Balance of Payments Equilibrium Exchange Rate, Based on 1999–2001 Trade Weights 1/

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None	0.35	69.85	47.86	0.0001
At most 1	0.26	33.89	29.80	0.0160
At most 2	0.09	8.42	15.49	0.42
At most 3	0.0037	0.30	3.84	0.58

1/ The dataset covers the period from the first quarter of 1980 to the fourth quarter of 2003.
The real effective exchange rate index is uses weights based on 1999–2001 trade data.
The vector autoregression includes 7 lags. A dummy is added to account for the surge in remittances and therefore net foreign assets that occurred in 2001.
Trace test indicates 1 cointegrating eqn at the 0.01 level and 2 cointegrating eqn(s) at the 0.05 level.

Table 11a. Cointegration Eigenvalue Test: Balance of Payments Equilibrium Exchange Rate, Based on 1989–91 Trade Weights 1/

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.
None	0.29	28.85	27.58	0.0343
At most 1	0.24	22.48	21.13	0.0322
At most 2	0.075	6.47	14.26	0.55
At most 3	0.011	0.92	3.84	0.34

1/ The dataset covers the period from the first quarter of 1980 to the fourth quarter of 2003.
The real effective exchange rate index is uses weights based on 1989–91 trade data.
The vector autoregression includes 7 lags. A dummy is added to account for the surge in remittances and therefore net foreign assets that occurred in 2001.
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level.

Table 11b. Cointegration Eigenvalue Test: Balance of Payments Equilibrium Exchange Rate, Based on 1999–2001 Trade Weights 1/

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.
None	0.35	35.96	27.58	0.0033
At most 1	0.26	25.47	21.13	0.0115
At most 2	0.09	8.11	14.26	0.37
At most 3	0.0037	0.30	3.84	0.58

1/ The dataset covers the period from the first quarter of 1980 to the fourth quarter of 2003.
The real effective exchange rate index is uses weights based on 19992001 trade data.
The vector autoregression includes 7 lags. A dummy is added to account for the surge in remittances and therefore net foreign assets that occurred in 2001.
Max-eigenvalue test indicates 1 cointegrating eqn at the 0.01 level and 2 cointegrating eqn(s) at the 0.05 level

Table 12. Estimating the Long-Run or Equilibrium Real Effective Exchange Rate (REER) 1/

	REER 2/		REER 3/	
Dependent variable: REER	Johansen	Fully-Modified OLS	Johansen	Fully-Modified OLS
GDPMAR	-1.85	-2.01	-1.72	-1.80
	[-3.03]	[-3.75]	[-3.75]	[-3.69]
GDPADV	3.32	2.40	2.03	1.91
	[3.45]	[3.01]	[2.69]	[2.64]
NFA	-0.015	0.005	0.004	0.005
	[-1.93]	[0.73]	[0.64]	[0.93]

1/ t-statistics are in brackets.

All regression equations include an unreported constant.

2/ The real effective exchange rate index uses weights based on 1989–91 trade data.

3/ The real effective exchange rate index uses weights based on 1999–2001 trade data.

Table 13a. Chi-Squared Test Statistics for Lag Exclusion, Based on 1989–91 Trade Weights 1/

	D(REER) 2	D(GDPMAR)	D(GDPADV)	D(NFA)	Joint
DLag 1	4.620150 [0.328538]	5.179631 [0.269358]	279.9410 [0.000000]	5.082031 [0.278984]	344.6047 [0.000000]
DLag 2	3.211264 [0.523114]	0.092317 [0.998967]	65.64122 [1.89e-13]	9.616858 [0.047401]	86.35657 [1.17e-11]
DLag 3	3.039124 [0.551300]	2.155753 [0.707138]	38.00132 [1.12e-07]	4.088724 [0.394132]	53.16089 [7.10e-06]
DLag 4	6.809927 [0.146280]	18.01584 [0.001225]	10.73928 [0.029656]	2.688528 [0.611224]	34.36948 [0.004843]
DLag 5	1.869872 [0.759677]	6.298961 [0.177906]	5.502097 [0.239545]	3.025125 [0.553630]	17.23056 [0.370831]
DLag 6	5.688415 [0.223657]	0.341593 [0.986973]	2.947043 [0.566726]	3.460346 [0.483933]	14.57571 [0.555906]
DLag 7	3.447983 [0.485832]	0.941751 [0.918496]	7.238466 [0.123810]	2.477671 [0.648639]	14.10950 [0.590557]
DLag 8	3.538455 [0.472055]	2.850401 [0.583164]	15.73906 [0.003390]	1.046020 [0.902739]	29.18638 [0.022709]
DLag 9	5.970936 [0.201329]	2.481641 [0.647926]	9.076595 [0.059213]	3.448489 [0.485754]	24.58284 [0.077525]
df	4	4	4	4	16

1/ Numbers in brackets are p-values. Column headings are the dependent variable of the equation under consideration. The real effective exchange rate index is uses weights based on 1989–91 trade data.

Table 13b. Chi-Squared Test Statistics for Lag Exclusion, Based on 1999–2001 Trade Weights 1/

	D(REER)	D(GDPMAR)	D(GDPFOR)	D(NFA)	Joint
DLag 1	13.21718 [0.010262]	4.639006 [0.326382]	246.8340 [0.000000]	3.489696 [0.479447]	355.1968 [0.000000]
DLag 2	9.844347 [0.043133]	0.775369 [0.941719]	54.81076 [3.56e-11]	6.456319 [0.167564]	97.49663 [1.02e-13]
DLag 3	7.323825 [0.119734]	6.816691 [0.145898]	24.14263 [7.48e-05]	1.706962 [0.789453]	59.81667 [5.62e-07]
DLag 4	12.43216 [0.014411]	18.39885 [0.001031]	6.619724 [0.157401]	0.961828 [0.915528]	39.91759 [0.000800]
DLag 5	6.313102 [0.176954]	11.64870 [0.020164]	4.845614 [0.303508]	0.475532 [0.975839]	27.28781 [0.038393]
DLag 6	9.471253 [0.050341]	2.440544 [0.655313]	2.278354 [0.684713]	1.252274 [0.869419]	19.87050 [0.226110]
DLag 7	3.616173 [0.460435]	2.667135 [0.614978]	5.838722 [0.211521]	0.167890 [0.996668]	13.35803 [0.646421]
DLag 8	8.763652 [0.067286]	4.392185 [0.355524]	8.472579 [0.075723]	3.118798 [0.538145]	28.42493 [0.028115]
DLag 9	10.23608 [0.036633]	4.997425 [0.287562]	6.721019 [0.151386]	3.366662 [0.498440]	35.99173 [0.002901]
df	4	4	4	4	16

1/ Numbers in brackets are p-values. Column headings are the dependent variable of the equation under consideration. The real effective exchange rate index is uses weights based on 1999–2001 trade data.

Table 14a. Statistical Properties of the Vector Error Correction Model, Based on 1989–91 Trade Weights 1/

Multivariate tests

	1	2	3	4	5	6	7	8	9	10
LM test	4.88 [0.996]	14.61 [0.55]	9.01 [0.91]	19.41 [0.25]	18.49 [0.30]	18.60 [0.29]	7.13 [0.97]	16.70 [0.40]	12.78 [0.69]	10.88 [0.82]
Normality JB					60.4 [0.000]					
Skewness					1.81 [0.77]					
Excess curtosis					58.58 [0.00]					

Unvivariate tests

	REER	GDPMAR	GDPADV	NFA
Weak exogeneity	5.69 [0.02]	0.60 [0.44]	1.87 [0.17]	3.83 [0.05]
Exclusion test	3.84 [0.05]	1.15 [0.28]	1.92 [0.17]	4.34 [0.037]
Normality JB	14.36 [0.0008]	14.9 [0.0006]	18.30 [0.0001]	12.83 [0.0016]

Source: IMF staff calculations.

1/ The misspecification test refer to the model that using the real effective exchange rate index with weights based on 1989–91 trade data. Numbers in brackets are p-values.

Table 14b. Statistical Properties of the Vector Error Correction Model, Based on 1999–2001 Trade Weights 1/

Multivariate tests

	1	2	3	4	5	6	7	8	9	10
LM test	8.76 [0.92]	10.62 [0.83]	6.73 [0.98]	16.42 [0.42]	16.46 [0.42]	16.93 [0.39]	12.47 [0.71]	18.22 [0.31]	16.23 [0.44]	12.08 [0.74]
Normality JB					57.75 [0.00]					
Skewness					1.56 [0.82]					
Excess curtosis					56.19 [0.00]					

Unvivariate tests

	REER	GDPMAR	GDPADV	NFA
Weak exogeneity	8.24 [0.004]	2.92 [0.087]	0.19 [0.66]	0.12 [0.73]
Exclusion test	9.15 [0.0025]	3.22 [0.073]	3.03 [0.082]	0.49 [0.48]
Normality JB	15.01 [0.0006]	14.97 [0.0006]	16.81 [0.0002]	10.96 [0.0042]

Source: IMF staff calculations.

1/ The misspecification test refer to the model that using the real effective exchange rate index with weights based on 1999–2001 trade data. Numbers in brackets are p-values.

THE BALASSA-SAMUELSON EFFECT[60]

One way to understand the Balassa-Samuelson Effect is to suppose for the sake of argument that the Moroccan economy is divided into two sectors that are subject to positive supply shocks through productivity increase, as one could expect if Morocco's structural reform efforts are successful. If productivity improvement occurs at the same pace within the two sectors, then wages will go up and the price of Morocco's goods will decline. There will be a real depreciation and Morocco will become more competitive. Wages go up because labor being more productive, labor demand increases. Prices go down because profit-maximizing firms would find it optimal to slightly reduce price and sell more of their goods. This is the supply curve shifting to the "right." This phenomenon is similar to what is described above and in Table 12 where growth comes along with real depreciation through relative price decline. However, if productivity improvements were not to occur at the same pace in the two sectors, the sector experiencing the fastest productivity growth, say sector one, would cause a wage increase in the economy. This happens because wages are linked across industries or because the overall labor demand rises in the economy. However, for sector two, whose productivity is increasing at a much lower pace, the wage increase may not be matched to the productivity increase. Prices in this sector would then tend to rise. The overall price index, which capture price movements in both sector one and two, can increase relative to trading partners', thus creating a real appreciation. This is the "Balassa-Samuelson effect."[61]

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[60] See Balassa (1964) and Samuelson(1964). The Balassa-Samuelson effect has been empirically investigated by, inter alia, Hsieh (1982), Marston(1990), Micossi and Milesi-Ferretti (1994), and more recently by MacDonald and Ricci (2001 and 2002), and Choudhri and Khan (2004). Micossi and Milesi-Ferretti for example found that between 1980 and 1990, the real appreciation of the Italian Lira and the Spanish Peseta was explained "almost entirely" by changes in the relative price of manufactured goods in terms of services. Choudhri and Khan used a panel data of developing countries and found that traded-nontraded productivity differential is a significant determinant of the relative price of nontraded goods, and the relative price in turn exerts a significant effect on the real exchange rate to appreciate.

[61] The original Balassa-Samuelson effect assumes that sector one is the tradable sector, and sector two, the nontradable sector. It also assumes perfect substitutability of tradable goods, which then leads to the law of one price in the tradable sector, so that prices do not go down, even when there is productivity increase. Firms in the tradable sector that experience faster productivity growth can sell any amount of their goods if they propose a price that is arbitrarily close to the "market price" from "below." They are guaranteed to sell any amount of their tradable goods because they are perfectly substitutable to competitors' and the price they offer is "below" the "market price." The profit-maximizing strategy is then to come as close as possible to the competitors' prices, while remaining "below" it. This is why the "equilibrium" or "market" price does not go down even when there is productivity increase. Wages go up because wages are linked across industries and because labor demand increases. Wage increase in the nontradable sector, which does not experience the same productivity growth as the tradable sector, leads to an increase in the price of nontradable goods. The overall price index unequivocally increases, causing a real appreciation, even when the law of one price holds in the tradable sector. In the text, the more realistic assumption of imperfect substitutability of tradable goods is made. Under this scenario, each firm has a "market power," and can still sell its goods, though in lower quantities, even when its price is higher than the competitors' who experience faster productivity growth. In other words, firms face a "downward-sloping" demand curve instead of a "flat" one.

(continued)

Now suppose that sector one and sector two are two sub-sectors in Morocco's tradable sector, and suppose that nothing happens in the nontradable sector. The "Balassa-Samuelson effect" will lead to an increase to the overall price of tradables, causing a real appreciation and a loss of competitiveness. Suppose now that sector one is the tradable sector and sector two the nontradable sector. Here, even if the "Balassa-Samuelson effect" does not lead to a loss of competitiveness because the prices of tradables do not increase, it can wipe out parts of the productivity gains of the tradable sector, if nontradable goods enter in the production of tradables, nontradables being more expensive. Finally, if sector one is the nontradable sector and sector two the tradable sector, or if the two sectors are sub-sectors of the nontradable sector, the resulting increase in wages and in the price of nontradables will raise costs in the tradable sector and lead to a price increase and a loss of competitiveness.

Note that the framework used for this analysis is based on macro-models of full employment. When labor demand increases, wages go up. This may not necessarily be the case when there is unemployment as it is the case in Morocco. An increase in labor demand is not guaranteed to lead to a wage increase. Nonetheless, one should also remember that wages are not always determined by market forces in a competitive environment as we assume here, but often by the strategic interaction between labor unions and employers. This is why wages can be linked across industries, where the same labor union can be active.

SUMMARY ASSESSMENT OF EXCHANGE RATE REGIME OPTIONS

Exchange Rate Regime	Benefits	Costs	Appropriateness for Morocco
Peg / Narrow currency band	- credibility of foreign currency helps contain/ anchor inflation expectations - can help enforce fiscal discipline - lowers the cost of nominal shocks - simple policy anchor - gives predictability to firms, in particular those operating in the tradable goods sector.	- no softening of the impact of real shocks, especially in a context of wage and price rigidity - makes adjustment to trade liberalization more costly for the import-competing sectors - no discretion in monetary policy without capital controls - vulnerability to crises under capital mobility -risk of building foreign exchange exposure	Less and less appropriate as trading partners become more diversified and financial integration proceeds further.
Crawling peg / Narrow crawling band	- avoids a tendency for the real exchange rate to get out of line with fundamentals in high inflation countries - can bring about a gradual disinflation if the crawling peg is active	- provides no medium-term nominal anchor if the crawling peg is passive - limits monetary policy discretion in the same way as a peg, given a prespecified path of exchange rate adjustments - difficulty to build strong impression of commitment to the exchange rate regime, as the rhythm of the crawl can be adjusted regularly - vulnerability to crises in a context of capital mobility	Not appropriate since inflation differential with Euro area is not significant, trading partners are expected to become more diversified, and financial integration is expected to proceed further

Managed floating / Large currency band / Large crawling band	- some degree of monetary independence - market forces play a role in exchange rate determination (their significance depends on the width of the band and the extent of interventions) - authorities retain the power to guide the exchange rate within the band - exchange rate movements contribute to market developments and limit foreign exchange exposure as well as the associated risks.	- foreign exchange exposure creates risks for banks and firms, but this problem can be mitigated if hedging instruments are available - some vulnerability to speculative attacks near the limits of the band in a context of capital mobility - lack of a transparent monetary anchor may generate high inflation expectations	Most appropriate in light of the increasing financial integration of Morocco, the proceeding diversification of its trading partners, as well as the limited foreign exchange exposure, once preconditions are satisfied. These preconditions are an alternative monetary policy framework, a sufficiently liquid foreign exchange market, an official foreign exchange intervention policy as well as the prudential regulation and institutional management of exchange rate risk
Freely floating	- greater monetary independence - better absorption of real shocks - lower risk of currency crises and bank crises	- foreign exchange exposure creates risks for banks and firms, but this problem can be mitigated if hedging instruments are available. - risk of free falling exchange rate in the absence of a policy framework consistent with price stability - risk of excessive exchange rate volatility and negative impact on investment and growth - large cost of devaluations in economies with currency mismatch	Not appropriate in the absence of developed financial and foreign exchange markets, and given that experience in conducting monetary policy without an exchange rate target anchor does not exist yet

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