# The Macroeconomics of the Public Sector Deficit

## The Case of Morocco

Riccardo Faini

Growth has remained relatively high in Morocco, and inflation subdued. Morocco has made great progress toward macroeconomic and fiscal stability, but the need remains for an unshaken commitment to fiscal discipline, a determined effort to reform the tax and public spending systems, and a measured attempt to make credit available for investment and to liberalize financial markets.

Morocco's recent economic history resembles
those of many African countries. Morocco's
economic difficulties originated in the commod-
ity (phosphate) boom of the mid-1970s, which
coincided with rising government spending and
an unprecedented expansion of public invest-
ment — ending Morocco's earlier fiscal conser-
vatism. A sudden reversal of the terms of trade
in the late 1970s — a result of a plunge in
phosphate prices and the second oil shock —
prompted Morc `o to resort increasingly to
external capital markets to maintain an unabated
level of public spending.

But the continued deterioration of the terms
of trade and the unexpected rise in international
interest rates, together with the severe drought of
1980-84, eroded debt service capacity and
precipitated a major foreign exchange crisis in
1983.

In response to this crisis, Morocco launched
a medium-term program of economic reform and
introduced comprehensive stabilization and
structural adjustment measures. Since 1983,
Morocco has made great progress in alleviating
both internal and external disequilibria —
reducing the budget deficit from 9 percent of
GDP in 1982 to 4.5 percent in 1988, and the
current account deficit from 12 percent of GDP
to 0.4 percent in the same period.

Interestingly, growth has remained fairly
high in Morocco, at least in relation to other
highly indebted countries, and inflation subdued.
Morocco's performance seems to contradict the
perceived wisdom that large budget deficits will
foster inflation. The inflation record is particu-
larly surprising because Morocco achieved a 20
percent real depreciation in the 1980s.

Faini argues that wage moderation and
judicious monetary policies were instrumental in
restraining inflation. With a brief exception in
1983, monetary authorities remained firmly
committed to avoiding inflationary financing of
the budget deficit. But this strategy could
succeed only because of the wide-ranging system
of credit and monetary regulations that chan-
neled domestic funds toward the treasury at
relatively low cost. But the prospects for con-
tinuing such a strategy are not favorable.

Growth performance can be attributed to an
outstanding export response to the new trade
regime and to favorable supply shocks —
including a string of record agricultural harvests
and the collapse of real oil prices.

Morocco has made great progress toward
macroeconomic and fiscal stability but the author
recommends:

• An unshaken commitment to fiscal disci-
pline. Increased government spending will
probably crowd out investment. The short-run
benefits on output of such spending may be
outweighed by its long-run negative impact on
growth.
• A determined effort to reform the tax and
public expenditure system, so the brunt of fiscal
adjustment will not again fall mostly on public
investment.
• Encouraging the availability of credit, which
significantly influences the demand for invest-
ment.
• Studying the impact of macroeconomic
equilibria, especially on the government budget,
to assess the best speed for financial liberaliza-
tion.

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by
Riccardo Faini*

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## 1. INTRODUCTION

Morocco's recent economic history bears striking resemblances with the one of many countries in Africa. The origins of Morocco's economic difficulties can be traced to the commodity (phosphate) boom of the mid-1970's which coincided with rising government expenditure and an unprecedented expansion of the public investment program signaling the end of the conservative fiscal policies of the past. The sudden reversal in the terms of trade in the late 1970's as a result of the plunge in phosphate prices and the second oil shock prompted Morocco to resort increasingly to external capital markets in order to maintain an unabated level of public expenditure. However the continued deterioration of the terms of trade, the unanticipated rise in international interest rates together with the severe drought in 1980-84 eroded debt service capacity and precipitated a major foreign exchange crisis in 1983. In response to this crisis, Morocco launched a medium-term program of economic reforms and, in consultation with the International Monetary Fund and the World Bank, introduced a comprehensive set of stabilization and structural adjustment measures. Since 1983 Morocco has made great progress in alleviating both internal and external disequilibria. The overall budget and current account deficits have been reduced from 9% and 12% of GDP in 1982 to 4.5% and .4% respectively in 1988.

There are several interesting features in Morocco's adjustment experience. Despite the severity of the crisis and the size of the adjustment undertaken, growth has remained fairly high, at least in relation to other highly indebted countries, and inflation subdued. As measured by the CPI, inflation was equal to 6.2% in 1983, it increased to 12.5% in 1984 but then steadily declined to reach 2.3% in 1988. During the same period real GDP growth averaged 4.3%. This performance seems to contradict the received wisdom that large budget deficits will foster inflation. The inflation record is particularly surprising if we also consider that Morocco achieved a 20% real depreciation during the eighties.

In this paper we try to uncover the reasons underlying the performance of the Moroccan economy. To anticipate our conclusions, we argue that wage moderation and judicious monetary policies were instrumental in restraining inflation. With one brief exception in 1983, monetary authorities remained firmly committed to eschew any

inflationary financing of the budget deficit. This strategy could only succeed however because of the wide ranging system of credit and monetary regulations which worked to channel domestic funds toward the Treasury at relatively low costs. The prospects for the continuation of such strategy are not favourable however. As far as the growth performance is concerned, it appears that it can be attributed to an outstanding export response to the new trade regime on the one hand and a set of favourable supply shocks, including a string of record agricultural harvests and the collapse of real oil prices, on the other.

The organization of the paper is as follows. In the next section, we study the evolution of the budget and of its different components. We also examine how the deficit was financed. In section 3, we argue that the reluctance by Morocco's policy makers to monetize existing budget deficits is well explained by the sharply unfavourable trade-offs between higher monetization and inflation that exist in Morocco. Such conclusions are based on the estimation of a system of assets demand. In the following section, we analyse the implications that continuing budgetary disequilibria entail on investment and saving decisions. We find that such implications may be substantial, even though they may not work their way exclusively through traditional interest rates channels. Finally in section 5, we assemble the various pieces of econometric evidence collected in the paper to study the impact of fiscal policy in the context of a macroeconometric model. The last section offers some conclusions.

## 2. THE BUDGET DEFICIT: EVOLUTION AND FINANCING

*a) the overall trend*

The budget situation in Morocco registers a continuous deterioration during the second half of the seventies. Some timid attempts to macroeconomic stabilization provide only temporary restraint to the burgeoning financial needs of the Treasury. However at the beginning of the eighties the fiscal repercussions of the fall in Morocco's terms of trade, the increasing burden of foreign debt attendant on the steep rise of international interest rates and the growing weariness of foreign commercial banks to provide continuing financing to the Treasury bring to the forefront the issue of fiscal responsability. As a matter of fact the budget deficit, measured on a cash-basis, shows a slow but steady decline starting in 1981. After increasing, as a percent of GDP, from an average value of 3.2% in 1971-1974 to 13% in 1976-1981, it declines to 8% in 1984-5 and appears to stabilize around 5% in the more recent years (Table 1).

Cash-based measures of the budget deficit can be however quite misleading. The Treasury may indeed resort to the use of financial arrears to cope with mounting financial difficulties. This is indeed what happened in Morocco until 1985. Because cash-based deficits do not allow for the accumulation of financial arrears, they will fail to refle the full pressure that fiscal policy exerts on available resources. Conversely, cash-based deficits will overestimate the size of the fiscal problem whenever financial arrears are being decumulated. Notice in this respect that, after 1985, adjustment programs in Morocco have involved a sizeable reduction in the stock of arrears. Overall, it is more appropriate to treat the accumulation of arrears as a source of (involuntary) finance and measure the deficit on a payment order basis. If this is done for Morocco, the deficit picture changes substantially. Both the initial increase and the subsequent decline in the budget deficit are more substantial when measured on a payment-order basis than on a cash basis (Table 2). This is simply due to the fact that arrears had been accumulated until 1985 and decumulated afterward.

A further correction relates to interest payments. As column 3 of Table 2 shows, the latter have steadily increased as a share of GDP, compounding therefore the budget difficulties. Yet allowance should be

made for the fact that, under inflationary conditions, a poter⁺ʰallly conspicuous share of interest payments represents early amortiz. on of outstanding debt and, as such, should be considered as a (negative) financing component. For Morocco, historically low inflation rates mean that this correction is not going to produce dramatic effects. Its impact is nonetheless substantial, albeit declining. From column 4 of Table 2, we can see that capital gains on domestic debt due to inflation were equal to 3.1% of GDP in 1984. Due to the drop in inflation, they then declined to 1.3% in 1988. As a result the operational budget, which only includes real interest payments, registered a relatively modest deficit in 198x and a surplus in 1986. We have also corrected for valuation effects in the stock of foreign debts, by multiplying the outstanding stock at the beginning of the period by the excess of domestic inflation (measured by the change in the GDP deflator) over the rate of devaluation (taken with respect to the nominal effective exchange rate). We feel much less confident about this correction insofar it overlooks valuation changes due for instance to cross currency fluctuations which appear to have played a substantial role in determining the evolution of foreign debt indicators for Morocco. We nonetheless report the results of such correction (column 5). Its impact is basically insignificant in 1984, but grows over time as domestic inflatic⁊ is no longer matched by a corresponding devaluation.

The last measure we consider is the primary deficit, which excludes all interest payments. By excluding a component which is to a large extent beyond the control of fiscal authorities, it provides a more accurate indicator of the effort to redress existing fiscal imbalances. The evolution of the primary deficit highlights the adjustment effort on the fiscal front. The primary deficit was equal to 7.2% of GDP in 1983 and has steadily declined since then to reach a surplus of 1.9% of GDP in 1988. This amounts to a turnaround equal to nine percentage points of GDP. The improvement in the overall and in the operational deficits are less significant due to the increased burden of respectively nominal and real interest payments.

Summing up, it is undeniable that Morocco has taken a decisive step on the road to redress its fiscal imbalances. The substantial achievements in the overall budget reflect an even more significant improvement in the primary deficit which more than compensated the rising burden of nominal interest payments. The favourable evolution of

the budget was also facilitated by low and even negative real interest rates on domestic debt. This situation is however coming to an end and the Treasury is now forced to offer positive and high real rates of return to convince domestic investors to finance its deficit. The average cost of servicing domestic debt is likely to rise quite rapidly in the near future, underscoring the need for continuing fiscal restraint.

b) *the primary deficit.*

In this section we shall examine how the sizeable reduction in the primary deficit was achieved. The relevant data are contained in Table 3. It is apparent how the burden of adjustment fell mostly on public investment which registered a major fall from 11.54% of GDP at the onset of the adjustment program in 1982 to only 3.61% in 1986 and recovered then, but only marginally, to around 6% in 1987 and 1988. The drop in public investment was therefore the major contributing factor in the process of fiscal retrenchment. This is an unfortunate feature of the adjustment process that Morocco shares with many other developing countries. We shall find in a later section how the decline in public investment may have negatively affected the private sector propensity to invest. Table 3 shows how other items also provided a sizeable contribution to fiscal restraint. Expenditure on goods and services fell somewhat, reflecting mostly the drop in public employees real wages and the more sober trend in public employment. Simple econometric analysis (not reported here) shows that expenditure on goods and services is not related to it  *ion, suggesting therefore that the latter was not paramount in reducing public sector real wages. Finally we find that also the share of subsidies in GDP fell substantially mainly because the decline in imported food prices reduced the need for government intervention. This is incidentally an interesting example of the <u>direct</u> impact of terms of trade fluctuations on the budget.

A comparison between the evolution of the primary deficit, as reported in Table 2, and the behaviour of public expenditure in Table 3 already suggests that taxation did not provide a noticeable contribution to the improvement in the budget. As a matter of fact taxation as a percentage of GDP fluctuates around 21% (Table 4). Had it not been for the windfall revenue attendant on the petroleum levy introduced in 1986, fiscal revenues would have actually registered a major decline over the

period 1983-'88. There are several causes behind this unsatisfactory evolution. On the one hand this was a time where, with the support of the World Bank and the IMF, the Moroccan government introduced some far-reaching reforms in the system of both direct and indirect taxation. For instance the introduction of VAT in 1986 is expected to represent in the medium-run a more efficient and more reliable source of revenue. Due to implementation problems it was however accompanied upon its introduction by a revenue shortfall. Similarly the overhaul in the system of direct taxation with the phasing out of a set of income taxes differentiated according to income sources and their consolidation into a unique tax is not likely to contribute to the budget in the very short-run. Other factors may also have helped to determine the evolution of tax revenues. For instance it is often argued that high inflation will reduce the real value of tax revenues because of delays in revenues collection. This effect is unlikely to be significant in Morocco because of relatively low inflation levels and may also have been offset by the bracket creep mechanism where taxpayers in an unindexed system are taxed at increasing rates because of the impact of inflation on nominal incomes. Again econometric evidence does not suggest a significant relation between the share of tax revenues in GDP and the level of inflation.

A further noticeable factor which affected the evolution of government revenues was the process of trade reform. In 1984, with the support of the World Bank, the Morocco government, in an attempt to rationalise the trade regime and reduce the protection to import-substituting productions, chose to substantially reduce import duties and gradually phase out the so-called special import tax, an across the board tariff. The revenue shortfall attendant upon this measure was estimated to reach 4% of GDP. Continuing budgetary difficulties prompted a reassessment of the situation. In 1987 the special import tariff had its rate increased to 12.5%, from 5%, and its name changed (to fiscal import duty). This policy shift is likely to lead to a growing contribution of trade taxes to government revenues.

The last column of Table 6 highlights the impact of terms of trade fluctuations on fiscal revenues. In Morocco production and trade of phosphate products (the main foreign exchange earners for the country) are controlled by the Office Cherifien des Phosphates (OCP), a public eneterprise. The latter contributes to the Treasury budget through tax and dividend payments. As shown in the Table, these contributions

TABLE 1

BUDGET DEFICIT
(cash-basis, before debt relief, in percent of GDP)

| Years | | Years | |
|-------|------|-------|-------|
| 1971 | 2.99 | 1981 | 13.64 |
| 1972 | 4.01 | 1982 | 9.22 |
| 1973 | 2.01 | 1983 | 11.51 |
| 1974 | 3.91 | 1984 | 8.07 |
| 1975 | 9.51 | 1985 | 8.57 |
| 1976 | 18.07 | 1986 | 5.69 |
| 1977 | 15.84 | 1987 | 6.11 |
| 1978 | 11.28 | 1988 | 5.45 |
| 1979 | 10.14 | | |
| 1980 | 9.01 | | |

Source: World Bank data base.

TABLE 2

BUDGET DEFICITS: VARIOUS DEFINITIONS
(as a share of GDP)

| | cash basis | payment order basis | interest payments | capital gains on dom. debt |
|------|-----------|---------------------|-------------------|----------------------------|
| 1983 | 0.115 | 0.121 | 0.049 | na |
| 1984 | 0.081 | 0.112 | 0.061 | 0.031 |
| 1985 | 0.086 | 0.096 | 0.062 | 0.030 |
| 1986 | 0.057 | 0.053 | 0.059 | 0.035 |
| 1987 | 0.061 | 0.057 | 0.059 | 0.022 |
| 1988 | 0.055 | 0.041 | 0.060 | 0.013 |

| | capital gains on foreign debt | operational deficit | primary deficit |
|------|-------------------------------|---------------------|-----------------|
| 1983 | na | na | 0.072 |
| 1984 | 0.005 | 0.081 | 0.051 |
| 1985 | 0.019 | 0.066 | 0.034 |
| 1986 | 0.017 | 0.018 | -0.006 |
| 1987 | 0.034 | 0.035 | -0.002 |
| 1988 | 0.045 | 0.027 | -0.0.) |

Source: World Bank data base

TABLE 3

CENTRAL GOVERNMENT EXPENDITURE
(before debt relief, in percent of GDP)

| Years | Current | Capital | G & S | Interests | Subsidies |
|-------|---------|---------|-------|-----------|-----------|
| 1971 | 14.12 | 3.72 | 12.51 | 1.01 | 0.60 |
| 1974 | 19.25 | 5.77 | 12.20 | 0.85 | 6.21 |
| 1977 | 18.58 | 18.93 | 14.44 | 1.50 | 2.63 |
| 1979 | 19.46 | 12.89 | 15.05 | 2.19 | 2.21 |
| 1981 | 24.60 | 12.33 | 15.42 | 3.88 | 5.30 |
| 1983 | 23.72 | 9.64 | 15.05 | 4.86 | 3.81 |
| 1984 | 24.00 | 8.09 | 13.63 | 6.08 | 4.29 |
| 1985 | 23.09 | 7.18 | 12.63 | 6.23 | 4.23 |
| 1986 | 20.62 | 3.61 | 12.20 | 5.92 | 2.50 |
| 1987 | 20.36 | 6.03 | 12.64 | 5.91 | 1.81 |
| 1988 | 20.31 | 6.34 | 12.17 | 6.01 | 2.13 |

Source: World Bank data base.

reached a peak in 1974/75, concomitantly with the phosphate price boom. They have been declining since (except for a small rebound in 1981), adding therefore substantially to budgetary difficulties.

c) *Financing the budget deficit*

The impact of budget deficits on macroeconomic conditions is to a significant extent a function of the mode of financing of the deficit itself. It is therefore essential to take a closer look at the way budget imbalances have been financed in the past. Prior to 1983, foreign borrowing financed nearly 60% of the Treasury deficit. The availability of foreign finance came to an abrupt halt in 1983, precipitating a major payment crisis. The government was forced to rely to an unprecedented extent on Central Bank borrowing during 1983 and, to a lesser extent, 1984. This was also the period when, as it was mentioned earlier, the government increasingly resorted to the accumulation of arrears as a source of involuntary finance from the private sector. Yet the increased monetization of the deficit would have unavoidably provided fuel for inflation. It was the firm commitment by monetary authorities to eschew inflationary financing which prompted a major revision in the financing strategy. Starting in 1984 the government increasingly began tapping non-inflationary domestic sources of financing. The Treasury reliance on voluntary domestic lending was enhanced by the need to reduce the sizeable stock of financial arrears. This strategy was helped by the partial liberalization of domestic interest rates which was associated with a major shift in the private sector portfolio composition from currency to time deposits. At the same time the ceiling on credit to the economy forced commercial banks to channel a substantial part of these financial resources to the Treasury, creating thereby a steady source of finance for government deficits. Another important component of the financing strategy was the direct sales of Treasury bills and bonds to the non-bank sector.

The counterpart of this strategy was its increased cost to the Treasury. To make time deposits more palatable to commercial banks, they were excluded from the base on which obligatory investment in Treasury bonds are calculated. Together with the reduction of arrears and the need to offer att·tive (post-tax) returns on direct issues of government bonds, this measure induced a significant increase in the cost of domestic financing for the Treasury. This is clearly reflected

in the rapid increase in the average real interest rate on government domestic debt, as noticed in the previous paragraph. Further institutional developments are likely to reinforce this trend, if existing proposals to reduce liquidity and portfolio requirements for the banking sector are implemented. In the last section of this paper, we shall assess the macroeconomic impact of furthering the process of financial liberalization.

We can try to sum up the main conclusions of this section and draw some implications for the future course of fiscal policy in Morocco. Overall Morocco has been quite successful in coping with formidable financial difficulties. The foreclosing of foreign borrowing in 1983 represented a major shock to the economy and to the Treasury, more significant perhaps than the rise in international interest rates. The two-prong response of Moroccan policy-makers relied on a sharp reduction in the Treasury financing needs and a shift in the composition of finance with a view of eschewing inflationary pressures. A key to the success of this strategy was the availability of relatively cheap sources of domestic finance, mostly determined by a complex system of financial regulations. However the difficulties of relying at the margin on financial repression as a cheap source of funds, together with the relaxing of fiscal discipline in the most recent years, have already prompted a reassessment of existing strategies and, perhaps more crucially, highlighted the sharp trade-offs that continuing budget disequilibria entail. Today the major question facing Morocco's policy-makers is whether the fiscal policy stance is consistent with the maintenance of low inflation, the resumption of investment and growth and the external payments constraint.

Consider the not too unlikely case where foreign finance will not increase substantially in the medium-run. Under these circumstances, the failure to persevere on the road to fiscal discipline may entail severe macroeconomic consequences. Even the perpetuation of present financing strategies of a relatively unchanged budget deficit would soon run into severe problems. First of all the budget is still extremely vulnerable to international interest rates and terms of trade shocks. For instance the revenue from the petroleum levy which in 1988 still represented 3.4% of GDP is likely to vanish under increasing oil prices. Second the cost of domestic finance is likely to rise steeply in the

future. Again the Treasury budget would be extremely vulnerable to such evolution. Would the cost of servicing domestic debt increase to competitive market rates, this would add to the budget an extra burden equal to around 2% of GDP.

Could Morocco resort at the margin on larger monetization of the deficit ? By international standards Morocco's inflation is typically low. An increase in the inflation tax may then represent a palatable alternative. However, besides the danger of tampering with monetary policy and damaging the credibility of the Central Bank commitment against inflation, there is actually little room for a substantial contribution to budget financing from increased monetization of the deficit. We will show in the next section that, for Morocco, estimated elasticities from a system of assets demand indicate an extremely unfavourable trade-off between inflation and monetary financing. Continuing reliance on non-inflationary sources of domestic finance is therefore essential to keep inflation under check. However this strategy could result in large increases in domestic real rates of interest. Besides putting into jeopardy budget equilibria, this would most likely crowd out investment. Moreover even if the increase in interest rates did not materialize and the perpetuation of a system of financial regulations guaranteed a source of inexpensive finance for the Treasury, the impact of unabated budget deficits on investment and on growth would still be significant because of their effects on credit markets. We shall examine this issue in section 4.

TABLE 4

TAX REVENUES (as a share of GDP)

|      | Total revenue | Income taxes | Taxes on goods and serv. | Taxes on int. trade |
|------|---------------|--------------|--------------------------|---------------------|
| 1971 | 0.14849       | 0.02827      | 0.07604                  | 0.02582             |
| 1972 | 0.14401       | 0.02814      | 0.07402                  | 0.02407             |
| 1973 | 0.16157       | 0.03206      | 0.07454                  | 0.02879             |
| 1974 | 0.21112       | 0.03294      | 0.06797                  | 0.03625             |
| 1975 | 0.23329       | 0.07023      | 0.07320                  | 0.04331             |
| 1976 | 0.20292       | 0.04011      | 0.07688                  | 0.04184             |
| 1977 | 0.21672       | 0.05145      | 0.08326                  | 0.05187             |
| 1978 | 0.21201       | 0.05343      | 0.08012                  | 0.04993             |
| 1979 | 0.22246       | 0.05364      | 0.07990                  | 0.05477             |
| 1980 | 0.20506       | 0.04507      | 0.07836                  | 0.05562             |
| 1981 | 0.22570       | 0.04765      | 0.07642                  | 0.06190             |
| 1982 | 0.22046       | 0.04125      | 0.08410                  | 0.06235             |
| 1983 | 0.21272       | 0.04380      | 0.08768                  | 0.05307             |
| 1984 | 0.20890       | 0.04438      | 0.08510                  | 0.05009             |
| 1985 | 0.20653       | 0.04337      | 0.08376                  | 0.04456             |
| 1986 | 0.18891       | 0.04040      | 0.07089                  | 0.03629             |
| 1987 | 0.20679       | 0.04475      | 0.07656                  | 0.03561             |
| 1988 | 0.22582       | 0.04717      | 0.07793                  | 0.03954             |

|      | petroleum levy | other taxes | OCP contributions |
|------|----------------|-------------|-------------------|
| 1971 | 0.00000        | 0.01836     | 0.00182           |
| 1972 | 0.00000        | 0.01778     | 0.00176           |
| 1973 | 0.00000        | 0.02617     | 0.00609           |
| 1974 | 0.00000        | 0.07395     | 0.06306           |
| 1975 | 0.00000        | 0.04655     | 0.06776           |
| 1976 | 0.00000        | 0.04408     | 0.02316           |
| 1977 | 0.00000        | 0.03014     | 0.01843           |
| 1978 | 0.00000        | 0.02852     | 0.01450           |
| 1979 | 0.00000        | 0.03415     | 0.01128           |
| 1980 | 0.00000        | 0.02601     | 0.01080           |
| 1981 | 0.00000        | 0.03973     | 0.01641           |
| 1982 | 0.00000        | 0.03276     | 0.00581           |
| 1983 | 0.00000        | 0.02817     | 0.00756           |
| 1984 | 0.00000        | 0.02933     | 0.00979           |
| 1985 | 0.00000        | 0.03484     | 0.01342           |
| 1986 | 0.02444        | 0.01689     | 0.00000           |
| 1987 | 0.02782        | 0.02204     | 0.00290           |
| 1988 | 0.03375        | 0.02743     | 0.00401           |

Source: World Bank data base

TABLE 5

IMPACT ON INFLATION OF A 1% INCREASE IN THE GDP SHARE
OF MONETARY FINANCING

| Initial inflation | low elasticities | High elasticities |
|-------------------|------------------|-------------------|
| 4%                | 7.5%             | 7.6%              |
| 6%                | 9.8%             | 11.1%             |
| 8%                | 12.9%            | 16.9%             |
| 10%               | 16.7%            | 26.4%             |

Source: own calculations

3. ASSETS DEMAND, SEIGNORAGE AND THE INFLATION TAX.

Received wisdom argues that, following the drying up of commercial lending after 1982, developing countries had to make a twin transfer of resources: one abroad to foreign creditors insofar as new lending had fallen much below the required service on outstanding external debt; the other internal, toward the government, to the extent that in several developing countries the State had taken onto itself the burden of servicing foreign debt. Together with the increase in interest rates and the fall in terms of trade, this has often meant the disruption of budgetary equilibria, already jeopardised in many cases by previous unsustainable fiscal policies. The inflexibility of the tax system, the downward rigidity of fiscal expenditure (with the noticeable exception of public investment) and the thinnes of domestic financial markets left then little choice to local policy-makers but to monetize the fiscal deficits with sometimes calamitous consequences on the inflation rate.

Under this interpretation, the exceptional inflation record in Morocco is undoubtedly puzzling. In the previous section it was shown how financial repression, by channeling low cost funds to the Treasury, was instrumental in a strategy of relying on non-inflationary sources of budegt financing. Yet the question remains of why Morocco's policy-makers remain staunchly opposed to even a limited monetization of the deficit and a greater reliance on the inflation tax. As a matter of fact inflation in Morocco is extremely low, 2.3% in 1988, even by the most stringent international standards. A recent report (United Nations-World Bank, 1990), while not explictly advocating an increase in inflation, argues nonetheless that there is some mileage for boosting revenues from the inflation tax. The issue however cannot be solved on purely theoretical grounds as the inflationary implications of deficit monetization depend on the response of money base demand to changes in inflation and interest rates. In what follows we shall argue that the outlook for greater monetization of the budget deficit in Morocco is altogether unfavourable. If we also consider the destabilising effects on Morocco's social fabrics and the loss of Central Bank credibility that a higher inflation would imply, we can perhaps understand the firm commitment of the country's policy-makers in favour of price stability.

The scope for increased government revenue from seignorage and the

inflation tax is determined by the private sector's choice of assets. In this paragraph we rely on a standard Tobin's portfolio approach to analyse the demand for currency, demand and time deposits. Other assets are not included in our analysis on the ground that, with the exception of real assets, they play a minor role in the private sector's choices. In what follows we assume that the demand for each asset is related to its own return, the other assets' returns and the level of income. As a proxy for the return on real assets we use the (expected) inflation rate, which however is not observable. We assume that expectations are formed rationally and depend on the set of information available at time t-1, which is defined to include the lagged level of prices, the money supply, the wage rate and the exchange rate. According to our estimates, the last variable does not contribute significantly to the prediction of future prices. This preliminary evidence suggests that, for Morocco, the pass-through from the nominal exchange rate to domestic prices is fairly weak accounting therefore for the fact that a sizeable real depreciation did not translate into higher inflation. Similarly the significant impact of wages on prices supports the claim that wage moderation (the real minimum wage declined by 7.3% from 1983 to 1988, after increasing by 17% in the three previous years) was instrumental in containing inflation.

The fitted value from the price equation is used as an estimate for expected inflation. In the process of estimation, we rely on Pagan's (1984) procedure and use our proxy for expected inflation as an instrument for actual inflation. This procedure is designed to yield consistent standard errors for the coefficients. We still have to determine whether the system of assets demand should be expressed in nominal terms (with prices included among the explanatory variables and the relevant homogeneity assumptions tested) or in real terms. We take the first course for the sake of generality and assume thereby that assets demand do not fully respond instantaneously to changes in prices. We also allow for the possibility of lagged adjustment to income and interest rates variations. Therefore the estimating equation for a generic asset $M^j$ reads as:

$$\ln M^j_t = a_0 + a_1 \ln p_t + a_2 \ln p_{t-1} + a_3 \ln Y_t + a_4 \ln Y_{t-1} + a_5 i_t$$
$$+ a_6 i_{t-1} + a_7 \pi^e_t + a_8 \ln M^j_{t-1} \qquad (1)$$

where p and Y denote the price and income level respectively, "i" represents the vector of assets' returns and $\pi^e$ is expected inflation. We would expect that in the long-run the price elasticity of assets demand is equal to one, i.e. that assets demands are homogeneous of degree one in prices. Formally this implies that $a_1+a_2=1-a_8$. We can reparametrize the previous equation to test this restriction:

$$\ln (M^j/p)_t = a_0 + (a_1-1) \ln p_t + a_3 \ln Y_t + a_4 \ln Y_{t-1} + a_5 i_t$$
$$+ a_6 i_{t-1} + a_7 \pi^e_t + (a_8+a_2) \ln p_{t-1} + a_8 \ln (M^j/p)_{t-1} \qquad (2)$$

If long-run price homogeneity holds, we have :

$$\ln (M^j/p)_t = a_0 - (a_2+a_8) \Delta \ln p_t + a_3 \ln Y_t + a_4 \ln Y_{t-1} + a_5 i_t$$
$$+ a_6 i_{t-1} + a_7 \pi^e_t + a_8 \ln (M^j/p)_{t-1} \qquad (3)$$

Eq. (3) shows that imposing long-run price homogeneity in a context where assets are expressed in real terms adds a backward-looking inflation term, $\Delta \ln p$, to the equation itself. This term however does not reflect any substitution effects between real and financial assets, but only lagged adjustment to price changes. Traditional money demand equations where inflationary expectations are simply modelled in a backward-looking fashion may therefore mistakenly interpret the significance of $\Delta \ln p$ as evidence of substitution toward real assets, whereas only a process of dynamic adjustment is involved. Our approach allows to distinguish between these two effects by separately evaluating the statistical significance of $\Delta \ln p$ and $\pi^e$. Admittedly though, the coexistence of these two effects may be difficult to justify on purely theoretical grounds.

In the estimation process we include in the vector of assets' returns ("i") only the interest rate on time deposits, $i^{td}$. Some demand deposits are also remunerated, but their return moves in a almost perfectly collinear way with the one on time deposits. We have therefore included the remunerated component of demand deposits in the aggregate of time deposits. We can now describe the results of the estimation of the system of assets demand. Our estimation strategy is as follows. We start from the more general dynamic specification in eq. 3 and restrict the model to obtain a parsimonious representation of the data generating

process. In what follows we only report the final equation.

All equations are estimated over the 1974-1988 period. The last year however is saved to test for out-of-sample stability. We begin by the demand for currency.

$$\Delta \ln (CUR_t/p_t) = -.45 - 1.10 \, i_t^{td} + .30 \ln Y - .60 \ln (p_t/p_{t-1})$$
$$\qquad\qquad (.17) \quad (.17) \qquad\quad (.07) \qquad\quad (.14)$$

$$- .70 \ln (CUR_{t-1}/p_{t-1})$$

$$DW = 2.01 \quad SER = .013 \quad LM = .25 \quad Hendry = 1.47$$

The demand for currency (CUR) is significantly related to the interest rate on time deposits $(i^{td})$ and to income. Actual inflation appears in the equation with a short-run elasticity of .60. This is not necessarily, as mentioned earlier, an indication of significant substitution possibilities between currency and real assets, but may simply reflect the fact that nominal demand for currency fully adjusts to changes in the price level only in the long-run. The coefficient on expected inflation instead is not significantly different from zero and bears the wrong (positive) sign. Jointly estimating the price and the currency equations (and testing for the expectational restrictions) did not improve the results. The variable $\pi^e$ therefore has been eliminated from the final equation. Finally the hypotheses that nominal demand for currency be unit-elastic in the long run with respect to the price level and to income are not rejected by the data $(t_{10} = .94)$. As diagnostic tools we rely on the Hendry test for out-of-sample stability and the Lagrange multiplier test for serial correlation. Both are distributed as $\chi^2(1)$. They do not provide any indications of misspecification.

We now turn to the equation for demand deposits (DD).

$$\ln (DD_t/p_t) = -11.65 - 8.46 \, i_t^{td} - 1.03 \ln (p_t/p_{t-1}) + 1.20 \ln Y_t +$$
$$\qquad\qquad (4.26) \quad (2.96) \qquad (.41) \qquad\qquad\quad (.37)$$

$$.76 \ln Y_{t-1}$$
$$(.26)$$

$$DW = 1.43 \quad SER = .033 \quad LM = 1.56 \quad Hendry = .81$$

Demand deposits have been defined to exclude saving deposits.

Following this modification, we find that both inflation and the return on time deposits play a significant role in affecting demand deposits. The long-run income elasticity is equal to 1.96 and significantly different from one. Once again expected inflation does not contr'bute in a statistically significant way to the equation. There is no sign of misspecification as indicated by the usual battery of tests.

The last component of our menu of assets are time deposits (TD):

$$\Delta \ln (TD_t/p_t) = -1.54 + 6.94\ i_t^{td} + .96\ [(\ln Y_t - \ln (TD_{t-1}/P_{t-1})]$$
$$\qquad\qquad\quad (.80)\ (4.22) \qquad\qquad (.18)$$

DW = 1.97   SER = .09   LM = .02   Hendry = .18

As expected, time deposits respond positively, albeit not very significantly, to an increase in their own rate of return. The dynamic specification of the equation is very simple. There is no evidence of lagged adjustment to prices as indicated by the insignificant coefficient on actual inflation. On the same ground, also expected inflation has been excluded from the final equation. It was not possible to reject the hypothesis that the demand for time deposits is unit-elastic with respect to income ($F_{1,9} = .54$). The LM and Hendry tests fail to point to some misspecification problems.

Overall the previous results indicate that the demand for monetary assets in Morocco is strongly influenced by the patterns of returns. The estimated semi-elasticities on the interest rate on time-deposits suggest potentially conspicuous shifts in portfolio composition in response to variation of the structure of interest rates. There is however less indication of strong substitution possibilities with respect to real assets. Our proxy for expected inflation never proved to be significant in any of the three equations. It is not apparently a problem of multicollinearity insofar as the coefficient on actual inflation was quite well determined even in the more general specifications. It is not either a problem of statistical methodology. Our approach should provide at least consistent estimates of the coefficients and of their standard errors. As mentioned earlier, more efficient simultaneous estimation methods which also allow for the expectational restrictions fail to change the basic findings. Perhaps our proxy for expected inflation is not well specified. Alternatively, expectations may to a large extent

have an adaptive form. We leave the matter unsettled.

To compute the amount of monetary financing the government can count upon, we must allow for the fact that in Morocco a distinction must be made between reserve requirements, which apply only to demand deposits, and liquidity requirements, which force commercial banks to invest a fixed share of their deposits in low yield treasury bills. Recent financial sector reforms have however substantially increased the interest rate paid on liquidity requirements which now approaches market rates levels. We include therefore liquidity requirements in the domestic public debt. The narrowly defined monetary base (MB) is therefore equal to:

$$MB_t = CUR_t + rr^{dd} DD_t \qquad (4)$$

where $rr^{dd}$ is the reserve requirement coefficient for demand deposits. At any point of time the amount of monetary financing is equal to the change in the monetary base. As a share of nominal GDP, the amount of monetary financing, $\Delta MB_t/(p_t Y_t)$ is equal to the rate of change of monetary base, $(\Delta MB_t/MB_t)$, times the GDP share of MB, $(MB_t/p_t Y_t)$.

We can now use eq. 4, together with our estimates of the demand of currency and demand deposits, to evaluate the relationship between inflation and the amount of monetary financing. We focus on a steady state situation and arbitrarily impose that demand deposits be unit-elastic with respect to income. As a result, the growth rate of MB will be equal to the sum of output growth (n) and inflation ($\pi$). Similarly the GDP share of MB will depend on the level of nominal interest rates and, possibly, of inflation:

$$\Delta MB/(pY) = (\pi+n) \frac{CUR + rr^{dd}DD}{p Y} = (\pi+n) [ A e^{-\alpha\pi} + rr^{dd} B e^{-\beta\pi}] \qquad (5)$$

where the coefficients A and $\alpha$ (B and $\beta$) are computed from our estimates of the currency (demand deposits) equation. In assessing the value of $\alpha$ and $\beta$ we face a basic ambiguity. Changes in the inflation rate can have a direct impact on the demand for monetary base to the extent that they lead to corresponding variations in nominal interest rate. We assume this to be fully the case. But changes in $\pi$ have also a direct effect on the demand for currency and deposits. However if we interpret

the significant coefficient of actual inflation in our estimates as simply evidence of lagged adjustment, then this effect should not reasonably play a role in this steady state kind of analysis. If alternatively we believe that expectations are adaptive and our results reflect the existence of significant substitution possibilities with real assets, then inflation should have an indipendent effect. Notice that, in the latter case, changes in inflation will exert a larger impact on the demand for monetary base. In what follows we allow for both possibilities.

We can use eq. 5 to compute the effect of a one percent change in the inflation rate on the quantity of monetary financing as a share of GDP. We take GDP growth to be equal to 4 percent. From eq. 5, it is clear that this derivative is a function of the initial share in GDP of currency and time deposits, which in turn depends on the inflation rate itself. We can also compute the inverse derivative, which measures the increase in the inflation rate attendant on a one percent increase in the GDP share of monetary financing (Table 5). Our estimates suggest that the inflationary impact of higher monetization increases very rapidly and the trade-offs between inflation and inflation tax worsens substantially as inflation increases. This provides considerable support to the choice of Moroccan policy-makers not to rely on inflationary forms of deficit finance.

## 4. INVESTMENT AND SAVING DECISIONS

### a) the investment choice.

A high rate of investment represents a basic condition for sustained increases in economic growth over the long-term. Since 1982 however the (current prices) GDP share of investment in Morocco has been steadily falling (with the only exception of 1988), raising increasing concerns about the long-run perspectives of the economy. Looking at the constant price ratio between investment and GDP would only accentuate the fall in investment, because of the increase in the real price of investment goods attendant on the real depreciation. More worryingly perhaps, the drop in capital accumulation is a generalised one, involving both public and private investment. Contrary to initial expectations, the fiscal retrenchment which took a toll on public investment was not compensated by a matching increase in private investment. Is the fall in investment a significant cause for concern ? Surely enough, it could be argued that most of the fall in investment can be predicated on the higher cost of capital. By encouraging less capitalintensive projects (and removing the previous bias against labourintensive productions), an increase in the cost of capital would allow the same level of growth to be achieved with a lower volume of investment. Under this interpretation the drop in investment would only represent the outcome f adjusting to a new constellation of factor prices. Empirical evidence on a relatively large sample of developing countries (Faini and de Melo, 1990) suggests that cost of capital considerations can account only for a small fraction of the fall in investment and other factors therefore must be at work. In what follows, we shall assess the relevance of this approach for the case of Morocco.

We rely on a simple model of a firm. The firm is assumed to maximize its net worth, subject to a standard neoclassical production function. In contrast with the traditional set-up however, financial choices are assumed to have a significant bearing on real decisions [1]. We model the impact of financial variables by assuming that external equity financing is unavailable and the firm must rely on two alternative sources of investment finance, i.e. retained earnings and bank's debt. Given that the entrepreneurs' discount rate is assumed to be larger than the risk-free interest rate (otherwise the firm would accumulate

financial assets , debt is the favoured source of investment finance.
(also perhaps because of tax considerations). An internal solution for
the optimal debt choice of the firm still exists, though, provided that
we assume that higher debt, relatively to the firm's capital stock, is
associated with increasing agency costs. Finally, because of constraints
in the credit market, at each point of time the debt to capital stock
ratio of the firm is bound by an upper constraint. Formally:

$$\max \sum (\frac{1}{1+i})^t [ p_t Y_t - w_t N_t - q_t I_t + B_t - (1+r) B_{t-1} - c(B_t, q_t K_t)] \quad (6)$$

s.t.
$$B_t \leq B_t^* q_t K_t \quad (7)$$

$$Y_t = F(K_t, N_t) \quad (8)$$

$$K_t = (1-\delta) K_{t-1} + I_t \quad (9)$$

where, in standard notations, Y, N , K and I represent the level of
production, employment, capital stock and investment respectively,
whereas B denotes the outstanding stock of debt. The function c( ), with
$c_1>0$, $c_{11}>0$ and $c_2<0$, is the agency cost function, which is assumed to
be quadratic. The output price is indicated as p, the wage as w, the
price of investment goods as q, while r and i denote the interest rate
and the discount rate respectively. We assume that $1+i= (1+r) (1+k)$
where k is a multiplicative risk premium. Finally $\delta$ is the depreciation
rate. Eq. 6 is the leverage constraint which defines the maximum
amount of debt as a time varying proportion (B*) of the capital stock,
while eq. 7 and 8 describe the production relationships and the capital
accumulation identity respectively. Suppose first that the debt
constraint is not binding. It can be easily shown that, at an optimum,
debt will be a fixed proportion , say $\gamma$, of nominal capital stock. In
turn $\gamma$ is a function of the risk premium k and of the parameters
affecting the position of the agency cost function [2]. Notice that $\gamma$ does
not depend on the interest rate. As matter of fact, variations in r (or in
the discount rate i) affect the level of investment, not the composition of
its financing. The choice of $\gamma$ in turn affects the demand for capital
which is otherwise determined in a standard way. If we consider the
case where the debt constraint is binding (i.e. $B^*<\gamma$), financial
conditions have a direct impact on the demand for capital. Under linear

homogeneity conditions in production, it can be shown that the optimal capital stock will be a function of output, the real cost of capital and the availability of debt. Formally:

$$K_t = K(Y_t, c_t / P_t, B_t^*) \tag{10}$$

where $c_t = q_t (1-\mu)(1 (1 \tau + \delta)$. The parameters $\tau$ and $\mu$ denote the corporate tax rate and the percentage reduction in q induced by the system of fiscal and financial incentives available to investors in Morocco. Full details for the calculations of $\tau$ and $\mu$ are provided in World Bank (1990).

One problem with the formulation of eq. 10 is that it contains one obviously endogenous variable, the level of output $Y_t$. In what follows we rely on the following procedure. It is assumed that, because of delivery lags, firms must determine their desired level of output, and therefore their investment, one period in advance. They will need therefore to predict, based on available information, the optimal level of capacity output for the following period. This will in turn determine their demand for investment goods. We also assume that expectations about the determinants of the output decision can be simply modelled by a first-order autoregressive process. The expected optimal level of output $(_{t-1}Y_t)$ will therefore be equal to:

$$_{t-1}Y_t = Y(P_{t-1}, w_{t-1}, c_{t-1}, Ipub_{t-1}, MS_{t-1}) \tag{11}$$

where the information set has been augmented to include both Ipub (the level of public investment on the ground that this may affect the production relationship ) and MS (the stock of money, as a further predictor of prices). In estimating eq. 11 we must allow for the fact that $_{t-1}Y_t$ is not observable. However, under rational expectations, it will differ from actual output Y only for a random term uncorrelated with any available information at t-1. We can therefore use the actual production level $Y_t$ as the dependent variable and take the fitted value of eq. 11 as the estimate of expected output.

By estimating eq. 11, it is now possible to take into account the endogeneity of Y in eq. 10. We follow again Pagan's (1984) suggestion and take the estimated value of Y (Yf) in eq. 11 as an instrument for the actual level of output in eq. 10. We present first the estimates of

eq. 11:

$$\ln Y_t = 7.01 - .30 \ln w_{t-1} - .26 \ln c_{t-1} + .43 \ (MS/Y)_{t-1} +$$
$$(.03) \quad (.60) \qquad \quad (.14) \qquad \quad (.26)$$

$$+ .52 \ (I_{pub}/Y)_t + .069 \ time - .04 \ d1$$
$$(.30) \qquad \qquad (.007) \qquad (.02)$$

$$R^2 = .99 \quad DW = 2.02 \quad SER = .02 \quad LM = .5$$

where d1 is a dummy variable which takes a value of 1 in
correspondance of the agricultural negative supply shocks in 1981,
1983 and 1987. The wage rate does not provide a significant
contribution to the equation. This may be attributed to measurement
errors (we use an indicator of the minimum wage) or to the fact that
labour does represent a significant constraint. The cost of capital
instead appears to play a more significant role together with public
investment and the money supply. As a diagnostic tool, we rely on the
Lagrange Multiplier test for serial correlation, which does not indicate
any significant problems. Moving now to the investment equation, we
find that:

$$\Delta \ln I_t = -3.55 + 1.94 \ \Delta \ln Y_t - .69 \ \ln (I/Y)_{t-1} - .76 \ \ln (c/p)_t$$
$$(1.82) \quad (.88) \qquad \qquad (.31) \qquad \qquad (.38)$$

$$+ 5.67 \ (B_F/Y)_t$$
$$(3.08)$$

$$R^2 = .50 \quad DW = 1.11 \quad SER = .12$$

where I represents private investment. $B_F/Y$, the ratio of firms credit
to GDP, is used as a proxy of the stringency at an aggregate level of the
debt constraint. The equation has been estimated by an instrumental
variable procedure, with the fitted value from eq. 11 as an instrument
for Y. The restriction that investment be unit-elastic with respect to
output has been tested ($t_{12} = .5$) and imposed on the data.

The estimation of eq. 10 yields two interesting results. First
investment is significantly affected by the real cost of capital. Fiscal
policy can therefore affect the investment decision through its impact

on interest rates or, more directly, by changing the set of fiscal and financial incentives available to investors. Second the level of investment in the economy will also depend on the availability of credit. The joint presence of both the cost of capital and of credit availability may appear redundant (or even contradictory), until we recall that investment in this model is not fully determined by the stock of credit that financial intermediaries are willing to extend to firms. Even if firms are credit constrained, a change in the interest rate r will still affect investment through its impact on the discount rate i and thus on the choice of retained earnings. By varying their retention behaviour firms can relax somewhat the credit constraint. Fiscal policy therefore will affect investment by influencing either the interest rate or credit availability. This latter channel, as we shall see later in the paper, can play a crucial role in determining the macroeconomic outcome of different fiscal policies. It is also plausible of course to interpret the joint significance of credit and interest rates in eq. 10 as implying that only a subset of firms is credit constrained. Finally, by putting together the estimation results for eqs. 10 and 11 we can argue that public investment bears a complementarity relationship with private investment. Indeed an increase in public investment will lead to higher capacity output (eq. 11 and, through this channel, to higher private investment. By severely cutting public investment, fiscal policy may have contributed in the past to the stagnation of private investment.

b) *the saving decision*

A steady supply of domestic saving will ensure that a sustained rate of investment would not be incompatible with existing constraints on the external payments front. It is essential therefore to gather an adequate understanding of the determinants of saving behaviour. Unfortunately the measurement of saving is beset with difficulties, to the extent that consumption is computed residually in Morocco's national accounts. We can rely on two alternative measures of private saving, one derived as the difference between private disposable income and private consumption, the other based on the saving-investment identity for the economy. Because of statistical inconsistencies, the two procedures do not yield the same result. In what follows we use the first measure. We find that, after peaking during the phosphate price boom and declining afterward, the average propensity to save has been steadily increasing during the 1980's.

To model the behaviour of saving, we first take a simple permanent income approach. Under well-known conditions the maximization of intertemporal utility by the representative consumer will imply that aggregate consumption (denoted as C) is simply equal to a proportion of permanent income ($Y^P$), i.e.:

$$C = k \, Y^P \tag{12}$$

Note that C should be defined to include only the consumption of non-durable commodities. Lack of data preclude this important refinement. For estimation purposes, at least two issues need to be addressed. First we must specify an indicator of permanent income. In what follows, we simply regress the actual value of real disposable income on a time trend and take the fitted value from such equation as an estimate of $Y^P$. Secondly we need to recognize that the parameter k will not in general be fixed, but will depend on the real interest rate and, possibly, the real exchange rate. The impact of both variables on the propensity to consume is however theoretically ambiguous. Our estimated equation reads as:

$$\Delta \ln C_t = .13 + .48 \; (\ln Y_t - \ln C_{t-1}) - .17 \, r - .044 \ln \lambda$$
$$\quad\quad (.12) \;\; (.08) \quad\quad\quad\quad\quad\quad\quad (.10) \quad (.018)$$

$$R^2 = .73 \quad DW = 2.25 \quad SER = .015$$

where r and $\lambda$ denote the real interest rate and the real exchange rate respectively. The latter is defined so that an increase in $\lambda$ implies a a real depreciation. In the estimation, the restriction that the long-run elasticity of consumption with respect to permanent income be equal to one has been tested and imposed in the equation ($t_{14} = .81$). Our results indicate that an increase in the real interest rate and a real depreciation will both lead to a decline in the propensity to consume.

This approach highlights two channels through which fiscal policy will affect private saving and consumption behaviour. First, fiscal policy may influence, through taxes and transfers, the volume of disposable income the consumers can spend. In this framework a temporary tax increase will have a more limited effect than a permanent increase. Second, fiscal policy may affect private saving by influencing the level of interest rates. Our estimates suggest that an expansionary fiscal

policy will crowd out through the interest rate channel both consumption
and investment demand. A third channel (not allowed for in the previous
estimates) may be however at work if rational private agents take fully
into account the future tax liabilities associated with bond-financed
deficits. The implication is that a shift from tax to debt finance of a
given volume of public expenditure should be neutral insofar as it would
be matched by offsetting private agents behaviour. This is because
private agents would be perfectly aware of the future tax liabilities and
the consequent reduction in their permanent disposable income that the
increased deficit entails and would correspondingly reduce their
consumption. This is known as the Ricardian equivalence hypothesis.
There are several reasons why this proposition may not hold, among
which it is worth mentioning the possibility that private agents may
discount the future at a different rate than the government and the
presence of capital market imperfections which hinder the intertemporal
smoothing of consumption by private agents. Evidence on these issues
for developing countries is limited (see however Rossi, 1988, Nam
1989, Haque and Montiel, 1989, Deaton 1990 and Haque, 1990). In
what follows we amend the previous specification to allow for the
possibility that, by reducing perceived disposable income, government
deficits may have a negative impact on consumption. We do not expect
this effect to be particularly strong in Morocco, because of the absence
of a consumer credit market and the likely pervasiveness of liquidity
constraints on households. To capture this effect we introduce liquid
assets (currency plus bank deposits) in our equation. We also allow for
inflationary effects on the ground that a high level of inflation will lead
to capital losses on liquid assets and impart a downward bias to the
traditional measure of disposable income. An increase in inflation
should also be associated with greater uncertainty and lead, through this
channel, to an increase in precautionary saving. If we estimate this
more complete model, we find that:

$$\Delta \ln C_t = .46 \underset{(.056)}{(\ln Y_t - \ln C_{t-1})} + .06 \underset{(.02)}{(\ln M_t - \ln C_{t-1})} - .09 \underset{(.02)}{\ln \lambda}$$

$$-.12 \underset{(.07)}{\Delta \ln p_t} - .13 \underset{(.05)}{(def/GDP)}$$

$$R^2 = .83 \quad DW = 2.16 \quad SER = .012$$

where, in standard notation, $p$ indicates the price level (so that $\Delta \ln p$ approximates the inflation rate), M denotes the stock of liquid assets and def/GDP indicates the ratio of the budget deficit to GDP. In this specification, which closely follows Hendry and von Ungern Stenberg (1981), consumers adjust their expenditures to ensure constant steady state equilibrium ratios of consumption to disposable income and to liquid assets. These long-run equilibrium ratios are affected by the level of the real exchange rate, by inflation and by budget deficits. The significant impact of budget deficits on consumption in Morocco may seem surprising, but was already found in work by Montiel and Haque (1989) and by Schmidt-Hebbel and Muller (1990). We have tried to assess whether this effect could be attributed to the fact that government expenditure on goods and services substitutes for private consumption, but the high collinearity between the deficit variable and government expenditure prevented such a test. Finally both higher inflation and a depreciating real real exchange rate have a negative impact on consumption. The real interest rate instead is no longer statistically significant and has been excluded from the equation. We can only speculate why the real interest rate no longer seems to be a significant determinant of consumption behaviour. One possible explanation could be that in the previous specification the real interest rate variable was actually picking up the effect of budget deficits. Indeed, as our last estimates suggest, a larger budget deficits lowers consumption and is also likely to be associated with rising interest rates. Overall this new specification appears to indicate an even stronger role for fiscal policy in influencing consumption behaviour.

## 5. MODELLING THE IMPACT OF FISCAL POLICY

A comprehensive analysis of fiscal policy requires an economy-wide model. In this section, building on the estimates already presented and on previous work by Faini, Porter and van Wijnbergen (1989), we present a simple macroeconometric model which will then provide the basis for an evaluation of fiscal policy in Morocco.

A full presentation of the model goes beyond the scope of this paper and can already be found in Faini et al. (1989). In what follows we only present a stylized description of the main features of the model. The latter is based on a simple variant of the aggregate supply-aggregate demand open economy framework. Noticeable features of the model include the emphasis on supply behaviour, the modelling of import demand under rationing and the analysis of both external and domestic debt dynamics. The presentation is organised by economic agents (firms, households, goverment, etc.) rather than by the more usual approach based on a distinction between markets (goods, labour, and money markets). This should permit a more critical evaluation of the microeconomic foundations of the model.

### a) a macroeconomic model

Table 6 can used as a guide to the main relationships comprised in the model. The first block of equations focusses on the firm. The approach used to specify the behaviour of the representative firms was described in the previous paragraph when analysing the investment decision. In eq. 1 in the Table investment (I) is a function of expected output $(Y^e)$, the cost of capital (c) and the availability of credit $(B_c)$. The cost of capital (eq. 2) is a function of tax ($\mu$ and $\tau$) and depreciation ($\delta$) parameters as well as of the interest rate r and the price of investment goods, $p_I$. In turn $p_I$ (eq. 3) is equal to a weighted average of the price of domestic $(p_{di})$ and imported capital goods, with the latter depending on the real exchange rate ($\lambda$, defined as the ratio of foreign to domestic prices) and on the tariff rate on domestic capital goods $(r_{mi})$. The specification of expected output is taken from eq. 11 in the text. After choosing total investment, the firm decides how to allocate it between domestic and foreign capital goods as a function of their relative prices and of the extent of quantitative restrictions on

imports of capital goods, $q_i$ (eq. 5). Short-run choices can be be described as follows. Output supply (Y) depends on total capital stock and the real exchange rate, where the latter acts as a proxy for variable costs. A real depreciation, i.e. an increase in $\lambda$, will boost wage and intermediate inputs costs and lowers supply. Given that capital stock data are not available in Morocco, we take a first quasi difference of the original supply funxtion and estimate equation 6. In the estimation we take the primary and the government sector output levels to be exogenous. After output supply is determined, the demand for intermediate inputs ($M_n$) and the supply of exports (X) can be simply described in eqs. 7 and 8 respectively as a function of Y, the wage rate (w) and the relevant price variable ($p_{mn}$ and $p_x$). We do not however assume the country to be small in export markets. The price of exports $p_x$ depends therefore on exports volumes, world demand (WD) and foreign competitors' prices ($p^*$). This completes the description of the firm's behaviour.

Households' choices are described in the second block of equations. We make a separability assumption where consumers first determine the level of saving and aggregate consumption and then allocate total consumption between domestic and foreign commodities. Aggregate private consumption is modelled as in the previous section (eq. 10). In the present version of the model we take the specification where private consumption depends on disposable income ($Y^d$), real interest rate (r) and the real exchange rate ($\lambda$). The allocation of aggregate consumption between domestically and foreign produced commodities is described by a simple (constrained) linear expenditure system. We allow for the fact that a subset of foreign consumption goods cannot be freely imported and study the impact of these rationing measures on total import of consumption goods. Our approach parallels the one used for investment imports and draws on Bertola and Faini (1990). As with investment goods, we do not allow for any rationing effect on aggregate consumption. The resulting equation is highly non-linear, but can be simply described (eq. 11) as stating that imports of consumption goods depend on total consumption, relative prices and the extent of quotas on such import category ($q_c$). Eq. 12 defines disposable income as the sum of GDP, net factor income from abroad (NFI), interest on public domestic (GDINT) and foreign (GXINT) debt, transfer (TR) minus total taxes (T) and monetary financing (MF). Note that interest payments on foreign debt (GXINT) are already included, with a negative sign, in NFI.

Then NFI+GXINT is a measure of net factor payments from abroad accruing to the private sector (mainly workers remittances). Finally eq. 13 defines private saving.

The behaviour of the government sector is described very simply by a set of accounting and technical identities. As far as taxation is concerned, we distinguish between trade (eq. 14) and income (eq. 16) taxes. Import duties are estimated endogenously in the model by applying the relevant duty rate to imports of consumption, investment, intermediate and other commodities. We also allow for the temporary levy on petroleum (eq. 15), which was introduced in 1986 and should be gradually phased out over the next few years. Information on the revenue likely to be generated by this levy was provided by IMF source... Finally the income tax rate is determined residually from total revenue data. Eq. 17 defines total tax revenue. Government expenditures are also fairly disaggregated. We distinguish between government investment (eq. 19), government current spending on goods and services (eq. 20), current transfers (eq. 18) and interest payments on both domestic ($B_g$ in eq. 21) and foreign (XD in eq. 22) debt. We can therefore account in our simulations for debt dynamics. The accumulation of foreign debt is determined by the current account deficit and by real exchange rate variations which induce a capital gain or loss in the value of outstanding external debt (eq. 25). The change in domestic debt ($\Delta B_g$) is equal to that part of the budget deficit which cannot be financed abroad (eq. 26). Simply manipulations show that $\Delta B_g$ can be also expressed as the difference between private saving and private investment. The last item in the consolidated government Central Bank budget identity is revenue from seignorage and the inflation tax (eq. 24).

Government revenue from seignorage and the inflation tax is determined by the private sector's choice of assets. Following the analysis in section 2, the demand for currency (eq. 27), for demand deposits (eq. 28) and for time deposits (eq. 29) is simply modelled as a function of income, inflation ($\pi$) and the interest rate on time deposits ($i^{td}$). In eq. 30 monetary financing (MF) is defined as the change of narrowly defined monetary base, i.e. of currency and of demand deposits the latter multiplied by the required reserve ratio ($rr^{dd}$). Finally conditions in the money market will help determine, through the banks balance sheets identity, the equilibrium in the credit market. The

sum of demand and time deposits define total commercial banks liabilities, which are allocated on the assets side among compulsory reserves (R), credit to the private sector ($B_p$) and credit to the government ($B_g$) (eq. 31. It is assumed that banks do not hold free reserves. Credit to the government has already been determined by the governement budget constraint for a given current account deficit and an inflationary target. From eq. (31) we find that credit to the private sector is determined residually. It will in turn affect, as was mentioned earlier, the demand for investment. Therefore, as claimed, fiscal policy will affect investment not only through its impact on interest rates, but also, more directly, by influencing the availability of credit.

To close the model we need to specify the equilibrium condition in the goods markets (eq. 33) where total demand, i.e. the sum of consumption, investment, government spending on goods and services and the resource balance (i.e. total exports X minus total imports M) [3], must be equal to aggregate supply (Y). A second condition relates to the current account constraint (eq. 34) which is identically defined as the sum of the resource balance and net factor income from abroad (NFI). It can be easily checked that:

$$S_p + S_g - CA = I + I_{pub} \qquad (13)$$

i.e. the sum of private, government and foreign saving (the negative of CA) is, in equilibrium, equal to total investment.

This completes the description of the model. In the next section we shall discuss some stylised properties of the model which will then be used to perform some simple comparative static exercices on the impact of fiscal policy.

*b) simulating the impact of fiscal policy*

Table 7 presents the complete model in summary form. There are 34 equations and 35 endogenous variables (33 left-hand side variables, allowing for the fact that Y appears twice, plus the real exchange rate and the real interest rate). In this section we present a number of simulations on the impact of fiscal policy. The common assumption underlying all the simulations is that the economy is rationed on

international markets. As a result the financeable current account deficit is given at each point of time, i.e. CA is exogenous. Notice that also the inflation rate is exogenously determined, at a level set by the Central Bank. Control on the money supply allows the Central Bank to achieve its inflation target.

As in the model by van Wijnbergen (1989), two equilibrium conditions play a crucial role in determining the equilibrium in the economy. One is the goods market equilibrium (eq. 33 in the Table), which can be read as requiring that demand and supply for domestically produced goods be equal. The second condition is the current account constraint, where the excess of private and public saving over total investment must be equal to the exogenously given level of the current account. This condition can be derived by combining eqs. 12-13, 25-26 and 33-34. The real exchange rate and the real interest rate will move to equilibrate the goods markets and ensure that the current account constraint is not violated.

Some further observations on the role of credit constraints and the interest rate are in order. It was shown earlier how both these factors will affect investment. Suppose that the credit constraint is binding, i.e. $B^* < \gamma$ in the notation of section 2. Suppose also, but only for a moment, that investment, and banks liabilities, are given. Then an increase in the interest rate would not move the credit market closer to equilibrium. As shown in section 2, the composition of investment finance (as desired by the firm) does not depend on the interest rate but only on the risk premium. However, in the context of our model, the increase in r will reduce investment, until all of it can be financed from available sources. The firm, though, is still off its notional demand for credit, being unable to achieve the desired composition of its investment finance. Despite the existence of credit constraints, interest rate variations still play a role in bringing into equilibrium saving and investment.

We pursue three simple simulation exercices. Column 1 in Table 7 presents the base solution. In the first comparative static exercice (column 2) we study the impact of an increase in government spending by MDH 3000. Foreign financing and domestic inflation are assumed to be unchanged. From eq. 26 in Table 6, we then see that most of the financing will rely on domestic debt. The increase in goverment spending

will both cause an excess demand for domestic goods and lead to a decline in saving and thus a current account imbalance. As expected, in the new equilibrium (column 2 in Table 7), the real exchange rate will appreciate (because of the excess demand for domestic goods) and the real interest rate will increase (because of the fall in saving). Growth increases somewhat, but the impact of the expansionary fiscal policy is mostly reflected in a crowding out of investment. Capital accumulation falls partly because of higher interest rates (whose effect on the cost of capital is however mitigated by the real appreciation) and mainly because of lower availability of credit.

Suppose now that the increase in government expenditure is financed from abroad. We model this by assuming that the current account is allowed to deteriorate by an amount equal to the increase in public consumption. The outcome of this simulation is presented in column 3. The higher current account deficit is equivalent to an increase in foreign saving. We would then expect the interest rate to increase less than in the case where no extra financing from abroad was available. This is not however what we find in the third column of Table 7. The real interest rate is now equal to 3.7% against 2.9% in the previous simulation. The reason for this somewhat surprising result hinges on the crucial role the credit market plays in this model. What is happening is that the possibility for the goverment to finance a larger portion of its deficit abroad reduces the pressure that government borrowing puts on credit markets, leaving a larger share of total domestic credit to the private sector. Investment therefore is not crowded out through credit rationing and declines less than in the previous simulation. A larger increase in the interest rate as well as a more sustained real appreciation are required to bring equilibrium in the goods market. When, as in the first simulation, the government higher expenditure was financed domestically, most of the crowding out of investment took place through credit rationing with more limited effects on the interest rate. The differences in outcome between the two simulations highlight the crucial role that conditions in the credit market play in determining the impact of fiscal policy.

Finally in the last column of Table 7 we consider the case where a foreign financed increase in government expenditure is accompanied by a process of financial liberalization. We model this process as a reduction in the liquidity requirement imposed on demand deposits.

TABLE 7
The complete model

---

*a) the firms*

(1) $\quad I = I(Y^e, c, B_p)$ $\qquad\qquad$ private investment demand

(2) $\quad c = p_I\,(1\text{-}\mu)\,[r\,(1\text{-}\tau) + \delta]$ $\qquad\qquad$ cost of capital

(3) $\quad p_I = \beta_d\,p_{di} + (1\text{-}\beta_d)\,(1\text{+}\tau_{mi})\,\lambda$ $\qquad$ invest. goods price

(4) $\quad Y^e = Y^e(w(\text{-}1), c(\text{-}1), I_{pub}(\text{-}1), MS(\text{-}1))$ $\qquad$ expected output$^+$

(5) $\quad M_I = M_I(I, p_{di}/p_{mi}, q_I)$ $\qquad\qquad$ imports of investment goods

(6) $\quad Y = Y(\,Y(\text{-}1),\,I,\,\lambda,\,\lambda(\text{-}1))$ $\qquad\qquad$ supply of goods

(7) $\quad M_n = M_n(Y, w/p_{mn})$ $\qquad\qquad$ imports of intermediate goods

(8) $\quad X = X^s(Y, p_x/w)$ $\qquad\qquad$ export supply of manuf. goods

(9) $\quad p_x = p_x(X, WD, p^\star)$ $\qquad\qquad$ export demand of manuf. goods

*b) the households*

(10) $\quad C = C(Y^d, r, \lambda)$ $\qquad\qquad$ private consumption

(11) $\quad M_c = M_c(C, p_{dc}/p_{mc}, q_c)$ $\qquad\qquad$ imports of consumption goods

(12) $\quad Y^d = Y+NFI+GDINT+GXINT+TR-T-MF$ $\qquad$ disposable income

(13) $\quad S_p = Y^d - C$ $\qquad\qquad$ private saving

*c) the government*

(14) $\quad TM_j = \tau_j\,\lambda\,M_j$ $\qquad\qquad$ import taxes (i=n,c,o,i)

(15) $\quad TP = t_p\,Y$ $\qquad\qquad$ petroleum tax

(16) $\quad TY = t_y\,Y$ $\qquad\qquad$ other taxes

(17) $T = \Sigma\ TM_i + TP + TY$ ... total taxes

(18) $TR = t_r\ Y$ ... transfers

(19) $Ipub = i_{pub}\ Y$ ... public investment

(20) $G = g\ Y$ ... govt. expenditure on goods and services

(21) $GDINT = i_{dd}\ B_g(-1)$ ... interest payments on dom. debt

(22) $GXINT = i_{xd}\ XD(-1)$ ... interest payments on foreign debt

(23) $\Delta\ i_{dd} = \Delta\ r + \Delta\ \pi$ ... interest rate on domestic debt

(24) $S_g = T\text{-}GDINT\text{-}GXINT\text{-}TR\text{-}G\text{+}MF$ ... government saving

(25) $XD = XD(-1)\ \lambda\ /\ \lambda(-1) - CA$ ... external debt

(26) $\Delta\ B_g - CA = I_{pub} - S_g$ ... govt. budget constraint

c) *the credit and the money markets*

(27) $CUR = CUR(Y,\ i^{td},\ \pi)$ ... demand for currency

(28) $DD = DD(Y,\ i^{td},\ \pi)$ ... demand for demand deposits

(29) $TD = TD(Y,\ i^{td},\ \pi)$ ... demand for time deposits

(30) $MF = \Delta\ CUR + rr^{dd}\ \Delta\ DD$ ... monetary financing

(31) $B_p = DD+TD-(R+B_g)$ ... credit to the private sector

(32) $\Delta\ i^{td} = \Delta\ r + \Delta\ \pi$ ... interest rate on time deposits

d) *national income identities*

(33) $Y = C+G+X\text{-}M+I+I_{pub}\text{-}\Sigma\ TM_i$ ... goods market equilibrium

(34) $CA = X - M + NFI$ ... current account

Notes:

+ not implemented in the present version of the model

Other symbols:

$\lambda$: real exchange rate

r: real interest rate

MS: money supply

$q_i$: extent of QR's on imports of type i

$B^c$: credits to firms

$p^*_{mj}$ foreign currency price of imports of type j

$p_{mj}$ domestic currency price of imports of type j

$p_{dj}$ domestic price of good j

$p_x$: export price

$\tau^x_j$ tariff rate on good j

$\tau$: corporate tax rate

w: wage rate

WD: world demand

NFI: net factor income from abroad

$\pi$: inflation rate

R: banks reserves

$rr^{dd}$ = reserve requirement for demand deposits

There are certainly beneficial influences from a more competitive and less heavily regulated financial sector, which are not however modelled in our set-up. But there are also some macroeconomic costs as shown in column 4 of Table 7. The direct impact of the reduction in the liquidity requirement is to increase interest expenses on public domestic debt and force the government to rely to a larger extent on domestic credit markets. The consequent decline in investment relieves the pressure on the domestic goods markets (indeed the real exchange rate appreciates by less than in the second simulation), but does not mitigate the impact on interest rate of higher public spending. Against the long-run benefits n financial liberalization, some allowance should therefore also be ie for the macroeconomic costs stemming from a further .arioration in the situation of the government budget.

TABLE 7
Simulating the impact of fiscal policy

| | base run (1) | domest. financed increase in G (2) | foreign financed increase in G (3) | financial liberaliz. (4) |
|---|---|---|---|---|
| r | 2.7 | 3.1 | 4.3 | 4.4 |
| $\lambda$ | 100 | 96.7 | 87.5 | 86.5 |
| I/Y | 18.4 | 16.1 | 16.5 | 15.8 |
| BD/Y | -4.8 | -6.8 | -7.3 | -8.1 |
| Y' | 6.7 | 7.1 | 8.3 | 8.4 |
| $B_p$/Y | 21.4 | 19.2 | 19.4 | 18.6 |
| GDINT/Y | 2.5 | 2.6 | 2.7 | 3.4 |

Legenda:  r: real interest rate, $\lambda$: real exchange rate, I/Y: GDP share of private investment, BD/Y: GDP share of budget deficit; Y': growth rate, $B_p$/Y: GDP share of credit to the private sector, GDINT/Y: GDP share of goverment interest expenses on public domestic debt.

Simulations:
    1: base case.
    2: increase in government current consumption of MDH 3000.
    3: as in 2, plus a current account deterioration of MDH 3000.
    4: as in 3, plus abolition of the liquidity requirement on demand deposits.

## 6. CONCLUSIONS

Morocco has made great progress toward macroeconomic and fiscal stability. Yet the need to consolidate and broaden the achievements to date remains paramount. We have argued in this paper that even the financing of a relatively unchanged budget deficit may pose major problems. It is unlikely that foreign finance will increase substantially in the medium-run. Monetary financing does not seem to be a palatable alternative given its highly inflationary implications (section 3). Finally increasing reliance on domestic financial markets is likely to lead to a steep increase in interest costs for the Treasury with a destabilising effect on the evolution of the main public debt indicators. Our simulations also suggest that an increase in government current expenditure crowds out investment. The short-run benefits on output of such a policy may then be outweighed by its long-run negative impact on growth. It is essential therefore that the commitment toward fiscal discipline remains unshaken. At the same time a determined effort is required to implement an effective reform in the tax and public expenditure system, with a view of avoiding that the brunt of fiscal adjustment falls again mostly on public investment.

At a more general level, we have argued that the effects of budget deficits cannot be measured by looking only at the impact they exert through changes in the interest rate on aggregate demand. As shown by Blinder (1987), Bernanke and Blinder (1988) and Blinder and Stiglitz (1983), a large part of the impact of fiscal policy may work its way through the credit market. An expansionary fiscal policy may exacerbate the pervasiveness of credit rationing effects on investment demand with limited impact on the level of the interest rate. Our estimates support the claim that, even after controlling for the cost of capital, the availability of credit plays a significant role in influencing the demand for investment. As suggested by our simulations, the credit channel in turn will be a crucial factor in determining the macroeconomic outcome of different fiscal policies. Finally we argue that the impact on macroeconomic equilibria, in particular on the government budget, should be a relevant factor in assessing the speed of financial liberalization.

ENDNOTES

[1] For a seminal contribution to the empirical evaluation of the relationship between capital market imperfections and investment decisions, see Fazzari et al. (1988).

[2] The formal solution to the firm's optimization problem is available from the author.

[3] In the empirical implementation of the model only manufacturing exports on the one hand and investment, intermediate and consumption goods imports on the other are endogenous. All the other components of the resource balance (mainly exports of phosphate rocks and agricultural goods, imports of food and petroleum, net tourism receipts) are assumed, in the present version of the model, not to depend on price incentives and are, as a result, projected exogenously. Some of these components, in particular tourism receipts, may be endogenised in a new version of the model. Similar remarks apply to the flow of workers' remittances (a component of NFI) which should not be treated as exogenous, but should be related to the level of the interest rate and the (expected) movements of the exchange rate.

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