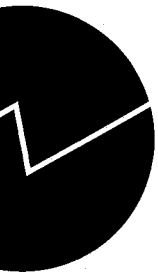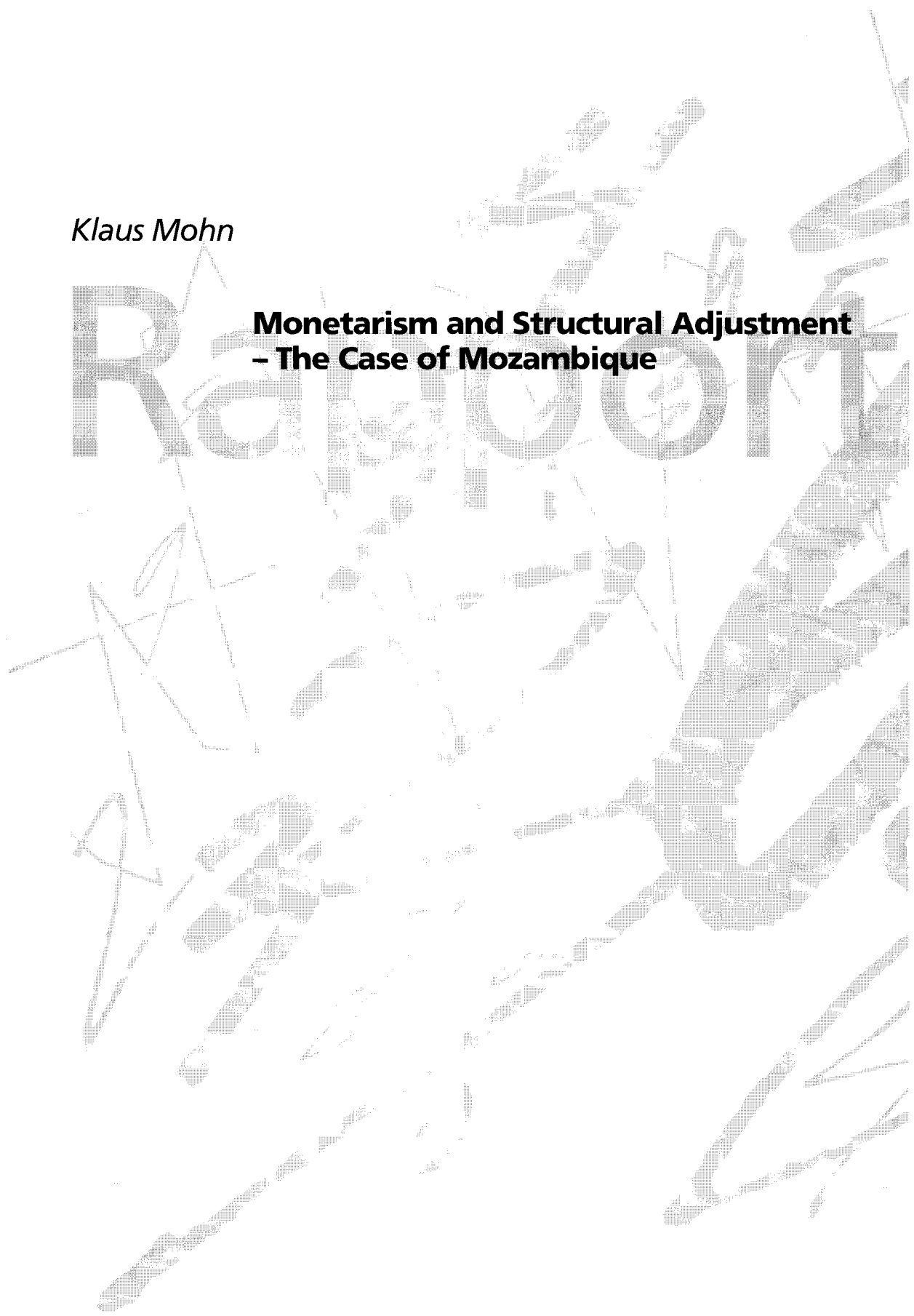Statistics Norway

Statistisk sentralbyrå

Klaus Mohn

**Monetarism and Structural Adjustment
– The Case of Mozambique**

Klaus Mohn

Monetarism and Structural Adjustment – The Case of Mozambique

Standardtegn i tabeller	Symbols in tables	Symbol
Tall kan ikke forekomme	Category not applicable	.
Oppgave mangler	Data not available	..
Oppgave mangler foreløpig	Data not yet available	...
Tall kan ikke offentliggjøres	Not for publication	:
Null	Nil	-
Mindre enn 0,5 av den brukte enheten	Less than 0,5 of unit employed	0
Mindre enn 0,05 av den brukte enheten	Less than 0,05 of unit employed	0,0
Foreløpige tall	Provisional or preliminary figure	*
Brudd i den loddrette serien	Break in the homogeneity of a vertical series	—
Brudd i den vannrette serien	Break in the homogeneity of a horizontal series	I

Abstract

This report is the result of a project undertaken by the Research Department of Statistics Norway to recapitulate the impact of economic policy on macroeconomic development in Mozambique. A brief review of the historical and economic origins of the structural adjustment paradigm is offered in the first chapter, whereas the second chapter contains a survey of the background and theoretical content of monetarism in development economics. The post-independence economic policy of Mozambique is reviewed in the third chapter.

A panel data set containing monetary macroeconomic indicators for ten countries in sub-Saharan Africa over the period 1980 to 1991 is presented and commented in the fourth chapter. Finally, a simple single-equation econometric model of economic growth is constructed and simulated to test and illustrate some hypotheses concerning monetarism and structural adjustment. The results seem to suggest a significant, but very modest spill-over from monetary to real economic variables. These results are probably due to the regulated macroeconomic environment which has been quite typical for developing countries in sub-Saharan Africa.

Keywords: Econometrics, Growth models, Macroeconomics, Mozambique.

Contents

1. Introduction*

1.1 Overview

This report represents the final documentation of a project undertaken by the Research Department of Statistics Norway to recapitulate the impact of the late macroeconomic policy in Mozambique, with sidelong glances and comparisons to the development of other economies in the region. The time span of primary interest is the period after 1987, in order to evaluate the effects of the structural adjustment plan implemented in cooperation with the multinational donor community.

The introduction offers a brief retrospect of the history of monetarism as a school of thought within development economics. Various attempts to evaluate the impact of structural adjustment are then reviewed. The general conclusion from empirical research on the area is that the structural adjustment programs seem to have had moderate beneficiary effects when *all* adjustors are included in the data set. However, this conclusion soon trembles if the scope is restricted to sub-Saharan Africa, where basic conditions for economic growth seem to be less developed than for e.g. the average World Bank client. The history of Mozambique makes these features especially important, but the level at which the Mozambican economy had settled by the middle of the 1980's still seems to have offered an outstanding potential for short to middle-term gains from structural adjustment.

General ideas of monetarism in development economics are reviewed somewhat closer in chapter 3. The main concern for extreme monetarists is to accommodate a stable economy by controlling the rate of monetary growth (and nothing else). The underlying idea is that the real economy has satisfactory self-controlling properties if only macroeconomic stability and low inflation is secured. Some detrimental effects of inflation in developing countries are therefore discussed separately to illustrate how high inflation may reduce the cost-competitiveness, discourage savings and investments, and cause capital flight. These effects are partly due to standard macroeconomic theory, and partly to peculiarities of the economies in developing countries.

Next, a simple formal macroeconomic accounting framework is set up to illuminate the different sources of monetary growth in a stylized developing economy. Financial gaps are identified in the private sector, the public sector, and by the current account. All these financial gaps can be directly linked with the money supply via simple national accounting equations. Thus, changes in the money supply are determined by the savings surplus in the private sector, the public budget deficit, and the current account.

Financial sector reforms have developed into an important and integrated part of most structural adjustment programs. The sub-Saharan experience with such reforms is also reviewed in chapter 2, in trying to draw some conclusions for future plans for the financial sector. The outcome of financial sector reform programs so far seems to suggest that too much has been spent, and too little has been achieved. The overall experience is that a restructuring the financial system has few or no positive effects unless it is accompanied by close attention the development of the real economy. For the future, financial reform programs are therefore recommended to take a somewhat more modest approach, starting from basics, always waiting for backing from the real side of the economy.

The last part of chapter 2 presents some critical remarks to the policy recommendations of typical monetarist structural adjustment programmes. First, it is stressed that financial liberalization and an according hike in interest rates may have significant contractive effects via the supply-side of the economy, because the price of credit plays an important role for the variable costs of most producers in developing countries. Second, the exchange rate is equally important for the domestic price-formation, as imported inputs are of extreme importance for developing countries in general, and for manufacturing industries in particular. This implies that also devaluations and cuts in the inflow of capital may have suppressive effects on the national income level, at least in the short run. As both these mechanisms work mainly through the supply-side of the economy, they leave room for stagflationary effects of monetarist policies in developing countries.

The fourth chapter contains a retrospect on post-independence economic policy in Mozambique. The first period after 1975 was characterized by a centrally planned economy with extreme lack of human and physical capital resources, both extremely important factors for economic development. This situation was worsened by the civil war, which throttled the economy for almost the entire last decade. The result is an economy where standard macroeconomic analysis has almost no interest, at least not before 1987. Economic development seems to have been triggered by the inflow of capital accommodated by the Economic Recovery Plan. However, the medium-term potential for economic growth seems to have been exhausted by the beginning of the 1990's. The peace treaty of 1992 offers quite some optimistic prospects, but the costs of war are formidable, and so is the growing debt-burden. This still makes Mozambique heavily dependent on external funds, also for the unforeseeable future.

Chapter 4 offers a comparison of social and economic indicators among ten countries in sub-Saharan Africa during the period 1980–1991.To track the development that has taken place over the last decade, the sample period is divided into two sub-periods. Different growth rates and levels are then presented and compared for the two sub-periods, and for the different countries. The main impression is that Botswana stands out as a wealthy nation compared to most other countries of the region. On the other hand, Mozambique is the poorest country of the sample, as measured by annual per capita gross national product (US$ 80). Regarding the economic performance over the last decade, the general impression is mixed. For Mozambique there seem to have been a significant turnaround in domestic production immediately after the implementation of the Economic Recovery Plan, but systematic success of economic policy is not verified by the descriptive analysis of chapter 4.

Econometric methods are applied in chapter 5 to establish an empirically-based relationship between the growth in the gross domestic product and different policy variables assumed to be under some degree of public control. The variables of our econometric model include broad money supply, the terms of trade, the exchange rate, net official transfers, and interest rates. The estimation suggests that the rate of economic growth is invariant to devaluations and changes in net official transfers. However, the other variables seem to influence the rate of economic growth during the 1980's, both via short-effects, and via long-run structural effects.

To illustrate the workings of the model, it is first simulated on historical data for Mozambique over the period 1986–1991, and the results lend support to the idea that macroeconomic analysis hardly was applicable for the Mozambican economy prior to 1987. However, the model offers a fairly good description of the evolution of GDP under the Economic Recovery Plan. Second, the model is simulated for the period 1993–2005 to illustrate the projected effects of some policy experiments. A slow-down in the rate of monetary growth produces a reduction in the rate of economic growth, and is thus contractionary, both in the short and long run. An improvement in the terms of trade seems to have undisputed advantageous effects, whereas the effect of an increase in the interest rates is mixed. An once-and-for-all increase in the interest rate is contractive in the short run, but increases the long-run rate of growth via the structural parameter. This may be interpreted by applying the ideas of the financial repression literature, where regulated interest rates are claimed to discourage domestic savings, thereby limiting the funds available for domestic investments.

Chapter 6 outlines some experimental simulations and projections for the economy of Mozambique. These experiments illustrate some important points concerning the effects of macroeconomic policy. First, there is a dilemma involved in the choice of gradual versus "cold turkey" strategies. Gradualism often dominates the alternative approach with respect to expected viability of the structural adjustment plans, but may be less effective when it comes to measuring the exact changes in economic indicators over time. Second, the presentation of chapter 6 underscores the importance of patience when implemented macroeconomic stabilization plans for developing countries are to be evaluated. The reason is that the macroeconomic processes seem to be really sluggish in these countries.

Finally, chapter 7 offers some concluding remarks and calls for further research on macroeconomic modelling for policy-planning in developing countries.

1.2 What triggered the structural adjustment approach?

During the 1970's, important parts of the world economy saw dramatic cyclical shifts and turns. The oil price shocks of 1973 and 1979, increasing inflationary pressures in the developed countries, and a rightward shift in politics in important western countries, produced a new scepticism towards the ruling approach to macroeconomics. It grew increasingly clear that Keynesian macroeconomics could not provide a fully satisfactory explanation of the inflationary pressures that seemed to have been caused mainly by the oil price shocks. Therefore, a worldwide concern for supply side macroeconomics emerged. In short, the economic policy of the industrialized countries reflected a switch of interest from aggregate demand management and employment considerations towards increasing monetary restraint and inflation control.

The developments in the real world did not escape attention in the more academic fields of macroeconomics and development economics. Thus, the popularity of the advocates of stabilization, deregulation, and liberalization went up. On the other hand, the former neo-keynesian consensus lost ground, both in the industrialized world and in the developing countries. The content of the emerging stabilization plans for developing countries must be understood on this background of historical events and real world phenomena. Together with the second oil price shock, the drop in OECD

growth rates caused a dramatic negative external shock to the economies of the third world. The implication was a deterioration in the terms of trade in most developing countries, again causing increasing deficits, both internal and external. The developing countries had to react to the external shocks, and those who responded quickly could somehow choose their own line of policy. But most developing countries were not able to respond, and so the misery developed until the eruption of the debt crisis of 1982.

The result was that the multinational donor society felt forced to take action on behalf of the countries that had failed to adjust their economic policy to the shifts in the macroeconomic climate. Structural adjustment lending and general conditionality principles were proposed as answers to the problems. Officially initiated by World Bank President MacNamara in Manila in 1979, programme lending "has ever since been associated with a particular lending window of the Bank: An instrument defined as quick-disbursing, exceptional balance of payment financing, based on economy wide conditionality" (Demery [1993]). Having corrected for distortions by *fictitious* shadow-prices for a decade, it was now time to get *actual* prices right. The economists behind the resulting adjustment plans were indeed influenced by the recent shift of paradigm in (esp. US, UK, and German) macroeconomics. Therefore, the plans that were designed came to rely quite heavily on supply-side economics, and so-called monetarism.

The structural adjustment programmes were intended to cause long-term changes, which in turn could increase the economic growth potential, and secure a sustainable repayment rate of the national debt. This conflicted with the former stabilization policies, which were criticized for narrowing the scope to short-run demand management in response to temporary and reversible shocks. A major difference from earlier approaches was also the emerging negligence of special peculiarities of the economy of developing countries. The new programmes of structural adjustment reflected a view that the macroeconomic mechanisms of the industrialized world are equally valid also in the developing part of the world.

This was largely how *monetarists* overcame *structuralists* in the approach to macroeconomics in developing countries. Thus, the worldwide shift of macroeconomic paradigm towards supply side economics came to mean a lot also for macroeconomic policy design in the third world.

1.3 The never-ending debate

For many developing countries, the entrance of the 1980's came to mean not just any new decade, but a total shift in economic conditions and policy. Structural adjustment programmes were introduced all over the world, but the results were at best mixed, at least in the short run. Together with the debt crisis of 1982 and political instability in many developing countries, the 1980's came to involve a significantly renewed economic and political climate for developing countries.

The structural adjustment programmes focused on three broad issues: Macroeconomic stability, lifting price controls, and public sector reform. Macroeconomic stability was to be accomplished by tight money and credit policies to bring down inflation, deregulation should handle the conversion to market prices, and privatization was the dominant instrument in the public sector reforms. However, the designers of the structural adjustment programmes were not allowed to work undisturbed, and were subject to quite massive criticism from the start. The former structuralists regrouped and formed the *neo-structuralist macro critique*. Again, attention was paid to the distinctive features of the economy in developing countries. But a main difference was now the attempts to fit the new ideas into a framework that also left space for supply side mechanisms. An example is Bruno (1979), who incorporates imperfect competition and unofficial credit markets in a macroeconomic model with flexible prices. Over the 1980's, the neo-structuralist macro critique produced a number of interesting ideas, some of which also surfaced in practical applications of development economics.

Another source of criticism was the social content of the structural adjustment programmes. This was brought to the surface of public debate by UNICEF in 1987, who argued that the lending programmes of the World Bank only exacerbated the adverse income distribution and social unrest. Slowly, the response to this appraisal surfaced through the introduction of so-called social action programmes. After a time, pre- and post-programme income surveys also came into use, to map the distributional impact of the structural adjustment programmes. This critique has indeed been fruitful, and today the programmes of the World Bank are not only viewing to efficiency matters, but they also show concern for the income distribution. It has also been acknowledged that a smoother transition to a market economy may substantially influence the political viability of the structural adjustment programmes (cf. the recent developments in Russia).

The World Bank has reviewed the practice of adjustment lending in a number of documents (e.g. World Bank [1988, 1990, 1992]), and Summers and Pritchett (1993) summarizes some of the findings of these reports. There are major identification problems emerging when the structural adjustment programmes are to be evaluated. First, it is problematic to separate the effects from adjustment from other aspects influencing the economy. Although a developing country has undergone structural adjustment, the improvement in performance may actually be contributed to other factors. More generally, a structural adjustment programme's ability to *predict* an upturn does not automatically imply that the upturn was *caused* by the programme. Second, a structural adjustment programme normally consists of two parts: A macroeconomic policy component and a capital inflow component. To distinguish between partial effects of these two components is quite arduous, not to say impossible. Third, it is important to clarify to what extent the countries involved really have submitted to the recom-

mendations made by the IMF and the World Bank. In Africa, both Zambia and Tanzania have emerged as typical on/off adjusters, and therefore the economic performance of these countries can not be attributed solely to the adjustment programmes (or other factors, for that matter).

As Summers and Pritchett (1993) develops into a somewhat partial treatment of World Bank policy, it does not deserve too extensive treatment in this connection. Still, their conclusions are worth noticing. Their scope is on adjustment *lending*, and according to the World Bank reviews adjustment lending generally causes faster growth, higher exports, reduced deficits, and increased savings. Thus, adjustment lending is claimed to work. Second, it is argued that the positive effects of adjustment are of medium to long-term character, requiring patience in evaluation of the reforms. Third, and interesting for sub-Saharan Africa, it is pointed out that adjustment lending generally seems to have worked more effectively in middle-income countries than in low-income countries. Summers and Pritchett (1993) actually state that "adjustment has helped, but has not solved the long-run growth problems of most low-income countries, *especially in sub-Saharan Africa* " (italics added). The general criticism against structural adjustment thus seems to bear a higher degree of relevance for sub-Saharan Africa than for the average World Bank client.

This impression is substantiated by a closer look at one of the latest policy research reports from the World Bank (1993). In this report the progress, payoffs, and challenges of adjustment in sub-Saharan Africa is subjected to an empirical analysis. The conclusions confirm the seemingly general view taken by the multinational donor society: sub-Saharan Africa is to be considered as a sick child. Accordingly, it is concluded that the areas of general macroeconomics and incentives need *more* of the same medicine, while the public and financial sectors desperately want a *change* in medicine. Thus, the fundamental view of how to address the macroeconomic problems of sub-Saharan Africa remains largely unchanged.

More interesting perhaps, are the comments to the World Bank (1993) offered by economists at the Research Department of Statistics Norway (Cappelen et al. [1993]). They conclude that the methods of the World Bank do not suffice for a good explanation of the links between inflow of aid, policy reforms, and macroeconomic performance. Further, it is argued that policy reforms may have caused significant positive changes even in the absence of capital inflow, again highlighting the identification problem involved in evaluating adjustment lending. Finally, and probably more seriously, it is suggested that some of the World Bank's conclusions seem to be biased in favour of structural adjustment lending. Although one may get the opposite impression by reading World Bank documents, there is still no consensus over the design and impact of structural adjustment.

When trying to explain why the response of sub-Saharan Africa to structural adjustment is minimal compared to the other adjusters, the World Bank (1993a) draws attention to features that are characteristic for sub-Saharan countries. Among these are institutional weakness, severe government failures, and lack of human capital. If one were to range the countries of sub-Saharan Africa according to these indicators, Mozambique would probably be struggling near the bottom of the list. In conclusion, the structural adjustment programmes seem to have had a slightly positive effect on average World Bank clients. This implies that empirical analyses on the matter may draw some supportive conclusions if all adjusters are included in the data set. However, these conclusions are easily modified if the scope is restricted to sub-Saharan African adjusters, where the point of departure is worse than in the rest of the third world. To what degree the argument is further extendable to the situation in Mozambique remains to be seen, and hopefully, the next chapter will shed some light on this question.

2. Monetarism in developing countries

2.1 The fundamental ideas

In short, monetarism is the view held by several neoclassical economists that the quantity of money has a predominant influence on the price level, and that the objectives of macroeconomic policy are best achieved simply by targeting the rate of growth of the money supply.

The following exposition is devoted to illustrating the central ideas of the monetarist approach to macroeconomic policy, and to stabilization and structural adjustment in developing countries. The outline is general, in the sense that it aims at providing a description of the ruling principles behind the construction of structural adjustment programmes for representative clients of the multinational donor society. However, without considerable loss of generality, some technical modifications are made to accomplish the special features of under-developed countries like Mozambique. These modifications particularly concern the repressed capital and financial markets, features that have implications for the transmission of monetary impulses. But before we concentrate on factors that influence on the money stock, the basic ideas of monetarism require a general introduction. The fundamentals of monetarism may be illustrated by the identity:

$$(1) \quad P\,Y \equiv M\,V$$

whereby the price level (P) multiplied by the gross national product (Y) must equal the money supply (M) times the velocity ratio (V). Although describing an accounting identity, equation (1) does not offer a proper behavioral explanation of the relationship between the four variables.

The identity of equation (1) may be transformed to relate the respective rates of change, which must imply:

$$(2) \quad \dot{p} + \dot{y} = \dot{m} + \dot{v}$$

Equation (2) states that the rate of inflation ($\dot{p}$) plus the rate of GDP growth ($\dot{y}$) must equal the monetary growth rate ($\dot{m}$) corrected for changes over time in the velocity of money ($\dot{v}$). Monetarists now claim that the physical volume of output is determined largely by some underlying long-run equilibrium in the markets for commodities and labour, and

that GDP growth is unaffected by monetary factors. Further, it is claimed that changes over time in the velocity of money are negligible compared to changes in the money stock, implying for equation (2) that $\dot{v} \approx 0$. Incorporating these modifications, equation (2) reduces to:

$$(3) \quad \dot{p} = \dot{m} - \dot{y}$$

Thus, for a given level of national income, the rate of inflation is given by the growth in the money supply. This claimed long-run relationship between money and prices substantiates the view that inflation results primarily from over-expansion of the money stock, and that inflation can be checked by proper adjustment of the monetary policy instruments. Further, equation (3) illustrates how a constant growth rate of the money stock also will secure a constant rate of inflation. This describes the core of Milton Friedman's celebrated declaration that inflation is always and everywhere a monetary phenomenon.

Every structural adjustment programme contains an element of macroeconomic stabilization. As we have seen, this approach to macroeconomics is dominated by so-called monetarists, who target the expansion of money and credit to create a stable and low-inflation macroeconomy. The reduction of inflation is thus crucial to the claimed intentions of the structural adjustment programmes. There are several reasons why inflation is a threat to developing economies. These include both traditional effects, and mechanisms that are more specific to the third world.

First, with sticky wages and fixed exchange rates, the cost competitiveness is reduced as a direct result of a higher rate of inflation than the rest of the world. This loss of competitiveness may be counteracted by a continuous devaluation of the currency to keep the real exchange rate constant. This is exactly what is observed in Mozambique and the other adjusting countries south of Sahara.

Second, the inflation rate influences the real interest rates, especially if nominal interest rates are subject to regulations. Regulation and segmentation are common features of financial markets in developing countries, and Mozambique is no exception. Low real interest rates will in turn cause

low domestic savings and capital flight. Thus, bringing down inflation may increase real interest rates and improve the efficiency of the financial markets. However, the observed pattern of capital flight can not be explained entirely by interest rate differentials, a fact that was accentuated for Mozambique in the middle 1970's. This illuminates the third detrimental effect of a high inflation rate: a special relationship between inflation and capital flight is claimed for developing countries. The explanation is that domestic and foreign assets may have different risk components. With a constant real exchange rate, foreign assets represent fairly safe investments. On the other hand, as the real value of domestic assets depend on the inflation rate, a volatile rate of inflation will make domestic assets a risky investment. If the level of inflation also indicates the volatility of inflation, a higher level of inflation will cause a shift away from domestic assets, resulting in capital flight.

Third, the above link between inflation and capital flight implies that an increase in the rate of inflation will reduce the availability of domestic funds for investment. Thus, there seem to be a special indirect link between inflation and investment in representative developing countries.

These different adverse effects of a high and rising inflation rate provide an explanation for the multinational donor society's concern with the rate of inflation. The next section illustrates the monetarist policy measures in a simple macroeconomic framework.

2.2 A monetarist macroeconomic framework

The following exposition aims at providing a simple technical framework for analyzing some of the monetary mechanisms in developing countries. This will serve as a point of departure for closer looks at the different factors that influence the growth of the stock of money. This kind of model framework is very useful to understand the ideas underlying the structural adjustment approach to development economics. In our model the private banking system is merged with the central bank, and the aggregated "money supplier" is referred to as the banking system. For Mozambique this is not an especially far-fetched assumption, as state-owned banks control over 95% of total assets (IMF[1992b]). With this simplifying assumption, our model framework contains five different holders of liabilities. These are: the government, private households, private firms, the banking system, and a foreign sector. However, the underdevelopment of the capital markets implies quite a lot of restrictions on different agents' access to capital assets, and this will be highlighted by the explicit and implicit assumptions made in the exposition below. The cardinal point of reference is the national income identity:

(4) $C + S + T \equiv C + I + G + (A - B) + F$

where C is private consumption, S is domestic saving, tax revenues are given by T, I represents investments, and G is public expenditures. Exports are given by A, imports by B, and F represents net transfers from abroad. Transformed

into a national flow-of-funds identity, equation (4) must also imply:

(5) $(S - I) + (T - G) \equiv A - B + F$

expressing that any domestic imbalances must be offset through the external accounts. The first term on the left side of equation (5) may be interpreted as net private saving, the second term is the surplus of the public sector, whereas the right side represents the current account surplus in the balance of payments. Allowing for international flow of public capital only, balance in the current account implies:

(6) $A - B + F = e (\Delta R^* + \Delta B^*)$

where e is the exchange rate, R^* is the change in foreign reserves in the banking system, and B^* represents changes in government borrowing abroad, materializing in terms of foreign sale of government bonds. The assumption that private firms and households are excluded from holding foreign assets captures the effects of a highly regulated foreign exchange market. However, this is not critical for the central results.

As we can see from equation (6), foreign borrowing is thus one of the sources of finance for the government's budget deficit. Another possibility is domestic sale of bonds (B), and these are assumed to be bought exclusively by the banking system, excluding both private firms and private households from the government bond market. This yields for the financing of the budget deficit:

(7) $G - T = e \Delta B^* + \Delta B$

With restrictions on private international capital flows, a saving surplus in the private sector must imply accumulation of the money stock (M) or a reduction in bank loans to the private sector (L):

(8) $S - I = \Delta M - \Delta L$

Inserting equations (6), (7), and (8) into equation (5) now gives for the change in the money stock:

(9) $\Delta M = e \Delta R^* + \Delta B + \Delta L$

Equation (9) establishes a direct link between national income identity of equation (4) and the evolution of the monetary base, and may be used to highlight the monetary transmission mechanisms stressed by the monetarist approach to macroeconomics. The first term on the right-hand side of equation (9) represents the effect on the money stock originating in a change in the foreign reserves in the banking system. The second term shows the impact on the money supply from an increase in the banking system's claims on the public sector, and thereby links the budget deficit to the money supply. The third effect incorporates the impact on the money supply from a change in credit to the private sector. This macroeconomic framework illustrates the main

ideas behind the financial gap analyses offered by the multi-national donor agencies. Financial gaps in the private, public, and external sectors of the economy cause changes in the money stock, and these monetary impulses feed directly onto the inflationary process. That may explain some of the multinational donors' concern for financial gaps.

The first term on the right-hand side of equation (9) links the money supply mechanism to the current account. This term is in accordance with the monetarist approach to the balance of payments, the extension of the traditional monetarist approach to international macroeconomics. The monetary approach to the balance of payments distinguishes itself from other approaches by focusing directly on the effects from the money market on the balance of payments, rather than working through the implied changes in the goods and asset markets. This school of thought is also an advocate of floating exchange rate regimes. The rationale for this conclusion is that a floating exchange rate is considered to adjust in order to equilibrate the international trade flows. For equation (9) this implies that e will settle at a value to satisfy:

$$(10) \quad e\Delta R^* = 0$$

If this is were complete story, any country would be able to control its domestic money stock independently of international commodity and capital flows by letting its currency float. Thus, the domestic stock of money may still be targeted by policy measures, and this is exactly what links the monetary balance of payments approach to traditional monetarism.

The second term on the right-hand side of equation (9) illustrates the link between the public budget deficits and the process of money creation. This highlights a common source of critique against the governments of developing countries, who are accused of financing their budget deficits by an inflation tax, or so-called seigniorage. The reason is that when the government issues new money, it really takes interest-free loan in the private sector. In turn, the private sector will have to bear the costs in terms of higher inflation. Similar results may be reached by an examination of the required reserve ratio. The banking system is required to hold a certain amount of reserves, and these are determined by the required reserve ratio as a constant share of total deposits. The money multiplier is negatively influenced by this required reserve ratio, which implies that "freezing" money in the banking system suppresses the efficiency of monetary policy. This conclusion rests crucially on the assumption that required reserves in the banking system also correspond to actual reserves held. However, in developing countries it has been quite common to use the reserve requirement ratio as a policy instrument, to finance the public budget deficits (cf. Fry [1988]). This implicitly means that the anti-inflationary effects of keeping reserves are undermined, and therefore it is claimed that for practical purposes the required reserve ratio may be considered an instrument of inflation tax in developing countries. This seemingly per-

verted content of the reserve requirement ratio is better understood if we keep in mind the extremely tight connection between the central bank and the government in developing countries, especially in some sub-Saharan countries.

The last term on the right-hand side of equation (9) describes the change in credit to the private sector. Thus, controlling the stock of money also implies monitoring the flow of credit to the private sector. Accordingly, the supply of credit is usually choked by restrictions like credit ceilings and directed credit facilities. In Mozambique, credit is normally out of the question for ordinary consumers, and largely also for small-scale producers. The credit control therefore seems to contain some adverse effects on the distribution of income. The implications for future policy design are commented in the next section.

2.3 The rationale for financial sector reforms

Financial aspects of economic development have played a significant role in the theoretical literature of development economics for decades (see e.g. Gurley and Shaw [1955, 1960], McKinnon [1973] and Shaw [1973]). However, during the 1980's these ideas seem to have established themselves to an increasing extent also in the multilateral donor society's design of structural adjustment programs in Africa, and a financial sector reform has recently also been implemented in Mozambique (IMF[1992b]). The public sector's reliance on the banking system has, coupled with high and unstable inflation rates, caused negative real interest rates in many African countries. Low real interest rates discourage savings, whereas the variability of real interest rates presents a threat to private investment. Lifting the interest rate regulations has therefore been an important part of financial sector reforms in these countries, but so far the positive results have been lacking almost totally. One explanation is that the competition of the banking system in African countries is limited because of the small number of suppliers of banking services. This leaves little room for competition and market-determined interest rates, in turn restricting the room for deregulation.

Table 2.1 Some indicators of financial deepening 1990

Country	Bank deposits to money supply (M2)	Public sector loans to GDP	Total loans to GDP
Botswana	0.53	0.01	0.10
Kenya	0.40	0.06	0.24
Malawi	0.74	0.03	0.10
Mozambique	0.74	0.23	0.36
Tanzania	0.64	0.25	0.28
Zambia	0.82	0.11	0.31
Zimbabwe	0.69	0.12	0.31
Japan	0.92	0.17	1.35
Norway	0.83	0.11	0.79
West-Germany	0.89	0.26	1.12

Source: IMF (1990), World Bank (1992b).

In Mozambique, the failure to bring down inflation has kept most real interest rates negative, despite nominal interest rates of over 40% on bank loans. The experience has shown that interest rate reforms are unlikely to succeed, unless the overall macroeconomic environment is stable and sound. For Mozambique this seems to suggest that a well-functioning financial sector is critically dependent on a reduced and stabilized inflation rate and an independent central bank, to secure a sustainable long-term credit and monetary policy.

Another characteristic of many African countries, including Mozambique, has been the variety of preferential credits, available for a number of sectors and activities. Political influence has made the directed credit programs favour public projects, thereby crowding out private sector investments. As the interest rates of the directed credits have adjusted only with a lag (or not at all), the programs may also be looked upon as a way of disguising subsidies. An ingredient of most of the financial sector reform programs has therefore been to cut down on these directed credit facilities, the central idea being that project selection should be market-based, not administered.

As the financial reform programs started, many African banks were badly managed, and even insolvent, both elements stressed in the financial sector study of Mozambique (IMF[1992b]). An important task has therefore been to re-capitalize the banking system in a broad sense. For the countries involved, this has in part proved overwhelmingly expensive, depending on the terms achieved by the banks regarding their bad loans. Neither has privatization of public banks proved especially successful. The overall experience seem to be that consolidation and recapitalization of the banking system has few or no positive effects unless it is accompanied by close attention to the general policy framework.

Another problem of almost all sub-Saharan countries concerns the level of skills of bank managers and their employees. There is room for improvement on all levels in this area, but in fields like simple accounting and auditing the problems seem to be especially serious. This is well-known also in Mozambique, as a considerable part of the blue-collar bank staff lack the most elementary skills of mathematics, and many managers know less than a minimum about accounting and auditing. The designers of the financial reform programs are to blame, as attempts to improve the financial expertise over the 1980's have been almost absent. Where the training aspect has been an integrated part of the reform, the results are at this stage weak. However, one should bear in mind that educational policies of this type have a typical long-term profile, suggesting that it still may be too early to judge their full impact. A related aspect is the adaptation of an appropriate legal environment, considered by experts as an important part of the financial sector reforms. Nonetheless, reforms of the legal system do not seem to have received the resources they deserve in designing and carrying through the structural adjustment programs.

In connection with the financial sector reforms, some effort has also been put into the development of domestic money markets. Where the fiscal and budgetary situation is somewhat stable, this seems to have been wise. One reason is that the establishment of a money market enables the central bank to perform market operations in order to manipulate the money supply. In addition, interbank markets let the banks provide each other with liquidity, instead of being forced to turn to the central bank for every temporary need of funds. More resources can then be devoted by the central bank to controlling the overall liquidity level. Domestic money markets also increase the availability of financial instruments, and this is likely to raise domestic savings.

Although the time span is short, it may well be claimed that the financial sector reforms of the 80's to a large extent have failed. The policy designers reached ambitiously at a problem that seemed important, overlooking the complexity and the interlinkages to the rest of the economy. The challenge of the future will therefore be to start from scratch and go somewhat more carefully ahead. Efficient payments and credit allocation, safe and sound banking, and financial discipline must be enforced well before resources are offered to the more idealistic ideas of money markets and extended financial deepening.

The experience with banking reforms suggests that recapitalizing and restructuring should not be addressed without attending also the real side problems of the financial system, so that the return of financial distress can be minimized. Future plans for restructuring of the banking system should further emphasize the importance of down-sizing and management and performance criteria. This will help in identifying and removing lemons from the banking system, securing an improved environment for suitable investors.

To improve the quality of services, one should also apply a strategy that will increase the competition of the banking system. However, this does not mean that an overall liberalization of entry should be introduced. As a result of the financial sector reforms, some countries are already over-banked. The country-specific design must therefore depend on the existing aggregate financial structure, taking into consideration the fact that liberal bank entry may in turn cause financial distress. The strategy of removing the directed credit facilities should be prolonged to secure profitable bank operation and improved monetary control. Direct credit channels are vulnerable to loan defaults and political captivity, reducing their efficiency in the allocation of credit. The development of market-based credit allocation should therefore be followed also in the future.

Agriculture and small-scale industry have proved to be important engines of growth in Mozambique during the late 1980's. The existing banking system is generally not at all designed to take care of the needs of these sectors. Consequently, the informal markets are left to provide credit to agriculture and small-scale industry. Dealing with small-scale customers is expensive for the formal bank sector, and these

activities are therefore left to the informal markets in the short term. Instead of trying to regulate the informal markets, in the longer run the governments should provide the formal banking system with conditions that make it possible to compete with traditional informal credit suppliers, also when it comes to small-scale industry and agriculture. This will imply a more efficient intermediary role of the formal banking system and at the same time improving the domestic payment systems. Still, to the extent that the existence of informal markets have adverse effects on the economy as such, action should be taken to link the formal and the informal credit markets. Then the policy instruments of the monetary authorities can be directed towards the informal sector through the formal banking system.

The financial reform programs have failed for a number of reasons, the most important being that the overall economic environment has not adjusted to support the financial development. This has caused a rapid return of general problems like mismanagement, lack of financial discipline, financial distress, and inefficient payment systems and credit allocation. However, in refreshing the development strategies for Mozambique, one should not jump to the conclusion that financial reforms should be abandoned, but make sure that they are appropriately phased. When planning for the future, financial reform programs are recommended to take a somewhat more modest approach, starting from basics, always waiting for backing from the real side of the economy.

2.4 Why monetarism might not work

The crux of any criticism against monetarism and structural adjustment is captured by looking closer into different economists' evaluation of short-term and long-term considerations. The monetarist approach is clearly concerned mainly with long-term macroeconomic stability in well-functioning market economies, stressing the stability over time of behavioral economic relations (e.g money demand). The implication is that also the macroeconomic framework is one of continuous *equilibrium*. Policy recommendations are characterized by a general laissez-faire attitude towards the role of the state. One of the few policy measures that should be applied, according to traditional monetarists, concerns the growth of the money supply, and this should be measured to accommodate a situation of long-run stability with a low and constant rate of inflation. Thus, short-run instability and macroeconomic disequilibrium are features that are regarded as less relevant to any description of the economy.

On the other hand, the neo-Keynesian is more of a *disequilibrium* approach, focusing less on typical long-run problems. Among the factors that are stressed are market-imperfectios, capacity utilization, and unemployment. The policy implications rest on an explicit care for short-run phenomena, and accordingly, neo-Keynesians recommend manipulation of aggregate demand, to prevent production and employment from fluctuating too dramatically in the short run.

According to the above distinction, it may be claimed that the two approaches are not developed to handle the same

macroeconomic problems, and therefore, that they should not be subject to direct comparisons. Further, it is tempting to draw the conclusion that monetarism and structural adjustment do not give proper answers because they do not formulate the appropriate questions. This conclusion rests on the assumption that the short-term problems are more important for developing countries than their long-run problems, and now we really approach the core of the ongoing debate. The challenge is therefore to compose an economic and political strategy that represents an optimal mix of short-run and long-run instruments.

This problem may well be illustrated by the case of agricultural production in Mozambique. Devaluations, decreasing inflation and transition to market-based food production are measures supposed to increase exports and purchasing power of the rural poor over the medium term. In the meantime they are suffering because of rapidly rising domestic prices, credit squeeze, and the riskiness of selling to a market. Together with a seriously underdeveloped infrastructure this might provide an explanation of the lack of supply response in agricultural production.

In addition to the basic conflicting views regarding short-run and long-run perspectives, there are significant divergences regarding the impact of the different policy measures. As noted above, monetarists tend to stress that developing economies are to be treated as any other economy, and that there are stable behavioral foundations with global validity. This view is opposed by the new structuralist macro critique. This school of thought underscores the special features of the economy in developing countries, leaving room for quite extraordinary results regarding the traditional instruments of economic policy.

As we saw in the previous section, a distinct feature of every financial sector reform programme for developing countries is the lifting of interest rate ceilings to liberate the financial markets. These efforts to make the financial markets more efficient may have real effects that are unique for developing countries, and these effects are largely neglected in the multinational donors' structural adjustment programmes. Below, we will look more closely into some of the reasons why interest rate liberalization may have contractionary and inflationary effects.

First, there are special features of the supply side of developing economies that may cause perversion of standard results concerning tight monetary policies and increased interest rates. Credit financing of working capital needs is crucial supporting a production process with extreme lack of liquidity in developing countries, especially in manufacturing industries. Tight monetary policies and increased real interest rates will increase the firms' costs of short term credit. This will push the marginal costs upwards, and for given prices, production will decrease. On impact one may experience that tight monetary policies may cause inflationary pressures via the supply side of the economy. These are perverted effects of monetary policies in developing coun-

tries that are stressed in a number of neo-structuralist works (e.g. Bruno [1979], Taylor [1981]).

Second, to the extent that consumers are active in the credit markets, one may experience contractionary effects of tight monetary policies also via the demand side of the economy. The reason is that a contraction of the monetary base will increase the costs of finance also for households, squeezing out consumption expenditures and aggregate demand. In addition, households must be assumed to place all their savings, whatever these might amount to, in unofficial credit markets, where the rate of return exceeds the deposit rate offered by the banking system. One of these is typically the black market for foreign exchange. An increased official interest rate is then likely to cause a reduced black-market premium, and those who have placed their savings in foreign exchange are therefore likely to suffer from a negative shift in real wealth. On an aggregate level this third-world specific effect may reinforce the contractionary effects of tight monetary policies via the demand side of the economy (see Montiel [1991]).

Third, a narrow connection between the commercial banking system, the central bank, and the government opens for quite peculiar macroeconomic effects concerning interest rates, financial liberalization and inflation. An important source of government finance is credit extended by the central bank, especially in socialist countries. With Tanzania as a point of reference, Collier and Gunning (1991) illustrate how the process of money creation is influenced by the intimacy between the government and the banking system in a socialist developing country. Their analysis may have relevance also for Mozambique. Collier and Gunning (1991) have the banking system's credit to the government as a point of reference. The banking system's assets are totally dominated by credit to the government, or to public enterprises. Financial sector reforms and interest rate liberalization in such an environment result in an escalation of interest payments from the government, again making the budget deficit increase. As far as money creation is influenced by the budget deficits, the rate of inflation may thus also be threatened by financial sector reforms.

Fourth, devaluations have a special effect in developing countries, reflecting the producers' critical dependence on imported inputs. We touched upon the same idea in chapter 2, when commenting on the recent history of economic policy in Mozambique. It is widely acknowledged that imported inputs play an important role in the production process of most developing countries. Table 3.1 reveals that Mozambique is no exception in this respect. Since the implementation of ERP, the access to foreign currency and imports have increased, and this development is in general tracked surprisingly precisely by the growth in GDP. However, the continuous devaluations of the currency have gradually squeezed the access to foreign funds, and the effect has been to throttle the import of inputs, again causing GDP growth to stagnate. In the long run Mozambique will have to improve the international competitiveness to be able to

pay for her imports. Nonetheless, the urban and rural poor suffer increasingly because of the emphasis on long-run policy. More generally, if the real wage rate is already at subsistence minimum, devaluations may cause hunger, unless the income reduction is accompanied by continuous inflow of funds. This illuminates the dilemma of choosing the right mix of short and long-run economic and political strategies.

That contractions of the money supply may have significant real effects is close to an established fact in standard macroeconomic analysis. Many industrialized countries take the consequence as they measure short-run strategies to counteract cyclical changes in employment and aggregate demand. However, in mapping out the strategies for developing countries, short run considerations seem somewhat neglected. Comparing the urgency of the social and economic problems in industrialized and developing countries, this can be considered as a striking observation. This view also finds support in the evaluation of the Norwegian development strategy concerning Mozambique made by Brochmann and Ofstad (1990). As argued earlier, Mozambique will be a country in severe economic and social crisis in many years to come. Accordingly, economic and political measures should be adopted to secure a development strategy with a human face, whereas the adjustment to a long-run sustainable situation should be undertaken with extreme care. These considerations are highly important, and should be followed even if they imply deviations from the plans made by the multinational donor society.

3. Structural adjustment in Mozambique

3.1 Post-independence economic policy

The macroeconomic setting of the early post-independence period was characterized by FRELIMO's attempts to introduce a centrally planned economic environment. As the dramatic exodus of 1974 had drained the country of both human and physical capital, the prospects of fast recovery were poor. During the last half of the 1970's, enterprises left by the Portuguese were taken over by the state, initially of practical as well as political reasons. As the confidence in leadership and ideology increased, the approach to economic policy was heavily influenced by FRELIMO's endeavour to introduce a socialist system of rapid development and equality. One may suspect the transition of the late 1970's to have been as spectacular as today's structural adjustment plans, and according to Bowen (1992), the post-independence economic and political strategy was completely in disharmony with the existing socio-economic conditions.

FRELIMO gradually acknowledged that the economy was in need of some sort of restructuring, and in 1980 the first ten-year plan of economic policy was set out. A rigid system of central planning was introduced, and to accomplish "victory over underdevelopment" the gross national product was meant to rise by 17% a year. Emphasis was placed on giant development projects like state farms, heavy industry, and energy production. Other dominant features of the ten-year plan were the organization of the peasantry into communal villages, and the collectivization of agriculture to increase production. By the fourth FRELIMO congress of 1983 it had become clear that the ten-year plan was a failure. The huge public projects were growing out of control, and were losing enormous amounts of money. The managerial capacity was lacking, both for the state farms and for industrial projects.

The ten-year plan was revised, and emphasis was now put on existing capacity. All new projects were of the small-scale type, and a division of the state farms into more practical units was initiated. At the same time, the government responded to the decline in production by credit expansion. However, these measures were not sufficient to stop the decline in all sectors of production. The expansionary monetary policy opened perilous financial gaps over the period 1981–1986: domestic credit increased by 150% while the

country's net financial assets practically dried out. In addition came the South African destabilization campaigns and the civil war, both aspects that seriously throttled the flow of most goods and services. Finally, as a result of extensive domestic price-distortions, the private producers lacked the necessary incentives for production to rise.

3.2 The Economic Recovery Program

To halt the economic contraction, and to gain access to multilateral donor funds, Mozambique joined the IMF and the World Bank in 1984. Thus, structural adjustment lending came to reach Mozambique, and by 1987 the inflow of aid and credit was conditioned on the implementation of an economic recovery program (ERP) designed by the Bretton-Woods institutions. The ambition of the ERP was threefold. First, the level of production should rise, to establish a minimum level of per capita consumption and income, with special emphasis on the rural poor. Second, the public and external deficits were to be closed. Third, the macroeconomic conditions should be prepared to support a faster pace of medium and long-term economic growth. From now on Mozambique followed a standard structural adjustment plan, incorporating characteristic features such as augmentation of market forces, improvement of private capital access, downscaling of the public sector, contraction of domestic credit, and dramatic devaluations. After the implementation of the economic recovery plan, IMF (1992, 1993l) and the World Bank (1992b) summarize the development in macroeconomic indicators as shown in table 3.1.

The ERP seems to have caused a certain immediate upturn in production and domestic absorption, but this growth levelled out already by the beginning of the 1990's. A variety of explanations have been put forward to explain this stagnation. These may be sorted into groups: external shocks, the costs of peace, and failure of economic policy. External shocks include factors such as political changes in Europe, changes in the inflow and composition of aid, the oil crisis of 1990, an erratic domestic insecurity situation, and varying climatic conditions. Export markets and sources of external finance collapsed after the breakdown of the former political regimes in Eastern-Europe.

Table 3.1 Key macroeconomic indicators for Mozambique 1986-1993								
	1986	1987	1988	1989	1990	1991	1992	1993[*]
Real growth rates								
GDP	2.3	4.6	5.5	5.4	1.3	2.6	-2.3	5.6
GDP per capita	-0.8	2.0	2.8	2.7	-1.3	0.1	-3.9	3.0[1]
Gross investment	51.4	15.6	16.5	7.3	8.5	2.5	-4.2	21.0
Ratios to GDP								
Debt service	..	..	39.8	37.3	35.3.	40.3	48.3	67.9
Gross investment	9.7	23.8	33.4	35.5	38.1	40.8	43.5	50.2
Domestic saving	-1.1	-10.5	-16.4	-16.6	-11.7	-9.7	-15.1	-22.6
Budget deficit								
Before grants	..	..	25.3	25.5	29.3	26.0	29.8	30.8
After grants	9.5	20.3	11.3	8.91	2.4	5.8	6.2	-3.4
Exports	3.6	11.9	15.1	15.4	15.9	22.6	26.7	29.7
Imports	14.4	46.1	65.0	67.5	65.7	73.0	85.3	102.4
Current account								
Before grants	-15.1	-45.7	-52.9	-58.8	-54.7	-53.9	-65.0	-103.0
After grants	..	..	-22.6	-28.9	-12.6	-17.3	-21.0	-41.7
Real exch. rate (1987 = 100)	438.5	100	63.3	63.4	63.1	52.6	42.1	41.0
Annual rate of inflation	32.5	163	50.1	42.1	49.2	33.2	45.1	39.6

[*] Estimates.
[1] Given the current estimate of population growth at 2.6% per annum.
Source: IMF (1992, 1993a), World Bank (1992b).

Mozambique used to have a good relationship with the former eastern block in Europe, especially with the former GDR, and this offered Mozambicans opportunities in the form of export markets, guest working, and access to capital and certain technological expertise. It is a widely held view that these factors are important in explaining the stagnation in economic performance around 1990. At the turn of the decade, some 14,000 guest workers returned from East Germany, as a direct result of the reconciliation between the two German states. This caused the elimination of an important source of labour training and foreign exchange. Indirectly, and perhaps as important, this repatriation also seems to have increased the already existing unrest in the Mozambican labour force, as the degree of labour militancy has shown a marked increase over the last few years.

When trying to explain the setback of the early 1990's, the World Bank (1993b) emphasizes the role of the level and composition of the inflow of aid. From 1990 we have seen a significant reduction in import support and programme aid, whereas food and emergency aid has risen moderately, mostly due to the drought of 1992. This implies a change in the distribution of aid away from typical growth-promoting funds towards short-term emergency aid. The World Bank also emphasizes the fact that the total inflow of aid has declined since 1990, especially as a result of the political events in Eastern Europe and the Soviet Union. Combined with the oil crisis of 1990, these external shocks may explain a part of the stagnation that occurred in 1990.

Climatic conditions vary considerably from year to year, an element that has a particularly influential bearing on agricultural production. With the exception of 1992, the climatic conditions were not particularly worse in the early 1990's

than over the 1980's. In spite of this, the annual growth rate of agricultural production fell from 4 per cent in 1989 to 1.1 and 1.9 per cent in 1990 and 1991, respectively (cf. table 3.1). Going further back than 1989, the stagnation in agricultural production becomes even more aggravating, as agricultural production increased by more than 7 per cent a year, both in 1987 and 1988. Thus, the implementation of the ERP had at best some temporary effects on the agricultural production, leaving long-term issues largely unsolved.

By the costs of peace, we refer to the parts of the peace process that may have negative influences on the potential for economic development and growth, especially in the short term. The multinational donors are also increasingly concerned with what they refer to as the increased public expenditures in connection with the demobilization. The new army is planned to total 30,000 soldiers. This implies the demobilization of some 100,000 troops. At an expense of US$ 700 per soldier this will cost the Mozambican government around US$ 70 million. In addition, there are considerable cost elements connected to the process of resettlement. The repatriation of refugees from neighbouring countries causes the population to increase, again pressing per capita growth rates downward. In addition, a great many of the former refugees are unemployed, homeless, and extremely poor. In the short run, they will therefore increase public expenditures for social services and immediate economic assistance. All these relatively acute aspects of the peace process have undoubtedly increased the expenditure side of the public budgets in the short term, whereas the observable economic benefits of peace are typically longer-term effects. As the peace was not settled until late 1992, the security situation was still unstable both in 1990 and 1991. A result was that industrial production was harmed by the de-

Table 3.2 The evolution of production by sector 1986–1992							
	1986	1987	1988	1989	1990	1991	1992[*]
Agriculture	- 0.6	7.0	7.2	4.0	1.1	1.9	- 8.0
Industry	- 18.6	- 4.3	8.9	6.8	- 8.3	- 0.5	0.0
Construction	- 4.4	44.8	- 16.0	3.0	1.5	3.0	2.0
Transport	- 11.8	1.7	- 9.8	10.2	19.8	13.2	4.0
Commerce	- 6.8	- 0.7	3.5	4.0	2.5	2.0	2.0
GDP	2.3	4.6	5.5	5.4	1.3	2.6	- 2.3

[*] Estimates.

Annual growth rates in per cent. Source: IMF (1992), the World Bank (1992b).

struction of electricity supply in 1990. Thus, the stagnation of economic development and growth may also have been caused by factors directly related to the insecurity of the civil war, and to the establishment of peace.

There are also economists who will have it that parts of the ERP itself may have caused the stagnation of the early 1990's. Critics of the structural adjustment plans for developing countries often point to industries' critical dependence upon imported inputs. If foreign currency is a scarce resource under these conditions, a bottleneck in the supply-side of the economy will evolve. If this kind of supply-constraint is binding, and the availability of foreign currency and imports is increased, one would expect an immediate upturn in production. This is almost exactly what can be observed in Mozambique directly after the implementation of the ERP. However, another element of the ERP was the gradual liberalization of the market for foreign currency. This implied that the *metical* was devalued continuously over the late 1980's, making the domestic price of imports rise. With the described link between imports and output supply, the bottle-neck may actually have narrowed again around the turn of the decade. This special feature of production technology may thus provide a partial explanation of the stagnation following the implementation of the ERP with a three-year lag.

Another aspect of the ERP itself concerns the monetary and credit policy. Pivotal to almost every structuralist adjustment programme is the ambition to reduce inflation. Available monetary instruments are applied to reduce the growth of the money and credit supply, as the links between money supply and inflation are essential according to the theoretical origins of the structural adjustment programmes. To believe in this prescription, one really has to "swallow a camel", and that is that the implemented monetary policy has no or few negative real effects. To the extent that Mozambique is producing at a natural price-inelastic full-employment level, tight money and credit policy may leave GDP unchanged, and inflation may be brought down. However, assuming that a contraction of the credit volume will leave production levels unchanged is quite absurd, especially for a country like Mozambique.

Accompanied by increasing real interest rates, the tight monetary policy of ERP is likely to have had significant negative effect on the evolution of production levels, at least in the short run. Not only has the credit-accessibility been reduced, but the price of the available credit has also escalated. One may dispute the relevancy of this argument, as the real interest rates are still very low, not to say negative. However, the *rise* in financial costs is nonetheless real, both for consumers and producers. As short-term credit makes up an important part of the variable costs of production in typical developing countries, the credit squeeze has probably caused contractionary effects also via the supply-side of the economy. Even more important, these supply side effects may have counteracted the overall anti-inflationary objective of the structural adjustment policy.

3.3 Looking ahead

To comment on the prospects for post-war development, it may be useful to draw a distinction between the short term and the medium to long term. Main immediate challenges are embodied in keywords as demobilization, resettlement, and emergency aid. On the other hand, the design of the continued policy reform is of utmost importance for the middle to longer-term growth and development possibilities. The level of welfare and development is quite extraordinary. Initially colonized by one of the backward nations of Europe, the struggle for independence resulted in an exhaustive exodus in 1974. Misguided central planning and civil war further worsened the overall economic situation up to the middle of the 1980's. Although a certain turnaround can be traced for the first years following the implementation of the ERP, it is a highly relevant question whether the inflow of aid in connection with the ERP has been as effective as might be expected. Thus, the long run issues of economic development and improved welfare still remain completely unsolved.

Mozambique is today one of the most aid-dependent countries of the world, and per capita income qualifies the population among the world's absolute poorest. Among the clients of the World Bank, Mozambique relates to the rest of Southern Africa as this region relates to the average World Bank client. Therefore, it is striking how little this special situation of Mozambique seem to have influenced on the design of policy prescriptions. Rather, a strategy of swift stabilization, liberalization, deregulation, and privatization seem to have been imposed on a country lacking most basic prerequisites for economic progress. This has left Mozambique as one of the most debt-ridden and aid-dependent countries of the world, whereas the benefits seem at least questionable.

Food support and emergency aid will have to dominate the use of capital inflow in Mozambique in many years to come. The rural poor have no buffer whatsoever, by which they could meet the climatic variations, and thus they are extremely vulnerable. In the short run, extensive attention will also have to be given to the problems concerning demobilization and resettlement. This is a critical factor in creating

the premises for a supportive environment in the medium to longer term, not only for economic development, but also for political stability. These efforts will take up a significant part of public expenses over the next years, whereas the economic benefits in terms of increased production and economic growth must be awaited with patience.

Regarding the economic policy design, Mozambique is now in many respects floating down a river of no return. Most parts of the process that has been launched are irreversible. This implies that the policy measures must be concentrated on adjusting the speed and exact direction of the initiated movement, as the main lines are largely predetermined by the ongoing economic reforms. In addition, the sequencing of the different parts of the programmes can still be controlled, and this instrument should be applied to foster elements regarded as influential, and to bridle any parts that are to be considered as ineffective or out of time/place. The overall objectives of the new National Reconstruction Plan (NRP) are the reduction of poverty, enhancement of growth and administrative training. Except for stressing the importance of institution-building, management training and human capital formation, nothing much has changed since the implementation of the ERP. One exception is the long-term external conditions, which have improved significantly after the civil war was brought to an end. The new security situation and the revised objectives of policy reform are promising to the extent that they may allow a larger share of the total inflow of grants and loans to benefit small-scale industry and farming in rural areas. This would mean a significant improvement, as the inflow of aid over the last years largely has been concentrated to urban and/or typically secure areas.

Today's Mozambique is characterized by a highly shattered economic environment. In addition, the country's situation will be one of deep economic crisis for years to come. Both human and physical capital is desperately needed to generate any increase in welfare levels. The most serious mistake analysts may make in designing the economic policy for Mozambique is to believe uncritically that this economy will react to macroeconomic policy instruments according to the same rules that seem to apply for the countries of the industrialized part of the world.

4. Ten countries in sub - Saharan Africa

4.1 Introduction

In order to construct indicators for social and economic performance and development, the World Bank's World Tables 1992 have been consulted to establish a panel data set for ten countries in sub-Saharan Africa. Many considerations influenced the selection of countries. First, to the extent that the data availability allowed it, the main cooperators of the Norwegian Agency for Development Cooperation (NORAD) were given preference. Unfortunately, Namibia have to be excluded due to lack of data, leaving us with five countries of the above described category. Second, five more countries were included to increase the total number of observations for the planned econometric studies. These countries are located in the same regions as the main cooperators of NORAD, to some degree sharing social, political, and economic characteristics with the rest of the panel. The countries included in the panel are (abbreviations in brackets):

Botswana (BWA)	Burundi (BDI)
Ethiopia (ETH)	Kenya (KEN)
Malawi (MWI)	Mozambique (MOZ)
Rwanda (RWA)	Tanzania (TZA)
Zambia (ZMB)	Zimbabwe (ZWE)

The country-specific time series range over the period 1980 to 1991 (12 years), giving a total of 120 observations. In World Tables 1992, the information on Mozambique is very scarce, and therefore supplementary sources have been used to construct time series for Mozambique that correspond to those of the other countries. These sources include The World Bank (1992b) and IMF (1992). For some of the other countries there were also "holes" in the World Tables, and these are repaired by using alternative data sources (mainly IMF [1993]), and in a few cases by extrapolation. Still, well above 95% of the records of the panel are the untouched figures from the data base produced by the International Bank for Reconstruction and Development.

4.2 Regional differences in population and production

The countries in our data set are very different, and the aim of the following exposition will be to shed some light on the
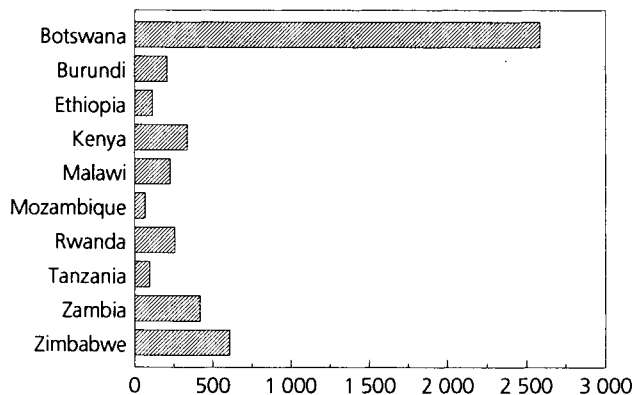
most important variations. Table 4.1 reproduces some demographic characteristics of the countries involved. The total fertility rate is the total number of child births per woman through the fertile ages, and indicates the growth potential of the population. For Mozambique, the fertility is close to the average for the ten countries of the table. Botswana and Zimbabwe are countries with comparatively low rates of total fertility, whereas Malawi and Rwanda stand out as countries where the average number of children per woman is relatively high.

The infant mortality rates measure the number of children per thousand who die every year before reaching one year of age. For this indicator, the simple average for the ten countries is 99, and thus Mozambique lies well above most of the other countries with respect to infant mortality. Further, there are only two countries with a lower life expectancy than Mozambique. Although crude, these two measures indicate that social conditions are relatively poor in Mozambique compared to the rest of the sample. The rate of urbanization is not outstanding in any direction in Mozambique, but as the civil war has made people flee to the cities, the rural population must be expected to increase considerably more than the urban population in the years to come. When measured by the size of the total population,

Table 4.1 Demographic key figures 1991				
	Total Fertility Rate	Infant Mortality Rate (deaths per thousand)	Life Expectancy at Birth (years)	Urban Population, % of total	Total Population
Botswana	4.5	36.4	67.6	29.0	1.29
Burundi	6.8	106.0	46.7	5.7	5.60
Ethiopia	7.5	129.8	48.3	13.3	52.89
Kenya	6.5	65.7	59.0	24.4	25.02
Malawi	7.6	149.2	46.2	12.1	8.80
Mozambique	6.5	136.3	46.8	28.3	16.14
Rwanda	8.3	119.8	47.9	8.0	7.40
Tanzania	6.6	115.3	47.3	34.3	25.27
Zambia	6.7	82.8	48.7	50.8	8.37
Zimbabwe	4.8	47.6	60.4	28.3	10.08

Figure 4.1 Per capita GNP in 1991 (US$)

But Mozambique is not the only country characterized by low per capita income figures. Other extremely poor countries include Burundi (US$ 210), Ethiopia (US$ 120), Malawi (US$ 230), and Tanzania (US$ 100). Except from Botswana, the most well-off country seem to be Zimbabwe, with US$ 610 in per capita GAP.

Figure 4.2 illustrates the variation in per capita net official transfers, as reported by the World Bank in World Tables 1991. Net official transfers comprise net transfer payment between governments of the reporting country and the rest of the world, and thus they should pick up quite a bit of what is referred to as development aid.

Again, the most striking feature concerns Botswana. It seems that Botswana has received transfers from governments of the rest of the world amounting to more than US$ 230 per capita in 1991. The low population of Botswana tend to inflate the inflow of development aid, when measured in per capita terms. The country also has several advantages that make her especially popular among the donors. During the 1980's, Botswana was located on the frontier to apartheid, and gained considerable support for holding South Africa at a distance. In addition, Botswana has a tradition of peace and democracy, both extremely important prerequisites for development cooperation and for economic growth. The mineral resources of Botswana have also contributed to the rapid formation of substantial liquid national wealth. Among the other countries of interest we observe that together with Burundi, Mozambique received relatively much in the form of net official transfers compared to other countries in the region. Ethiopia, Kenya, and Malawi are localized near the bottom of the scale, partly due to political controversies in recent years. However, there is reason to believe that this situation can be improved if the political unrest is settled.
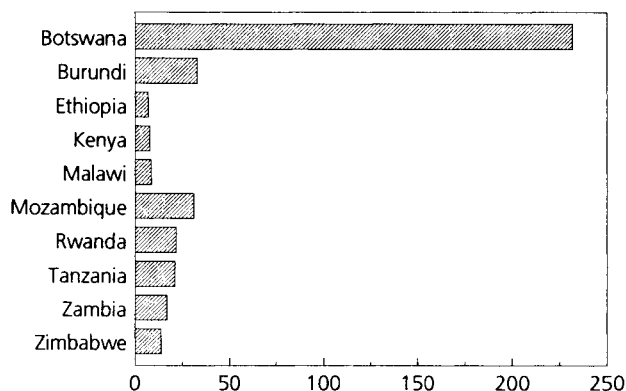
Mozambique is almost exactly average size in the constructed panel. Observe also the dramatic variation between countries with respect to population size. Botswana is small with its 1.3 million inhabitants, whereas Ethiopia must feed a population 40 times larger than that of Botswana. This variation should be kept in mind when figure 4.1 is examined.

Figure 4.1 illustrates how per capita gross national product varied over the ten countries in 1991. Gross national product includes gross domestic product at market prices plus factor income from abroad. Botswana seems to be extremely rich compared to the rest of the sample. This is also true, and with vast mineral resources and large foreign reserves, Botswana is receiving reduced attention from the multilateral donor community.

On the other hand, Mozambique is on the bottom of the scale with an estimated US$ 70 per capita GNP. Accordingly, one should think that Mozambique would have a correspondingly high priority with the donors.

A dramatic inflow of development aid may also have created unhealthy structural mechanisms in the economy. These effects are described in a theoretical context by van Wijnbergen (1984), where it is argued that continuous inflow of capital in the form of development aid may have effects similar to those of petroleum income, causing the so-called Dutch disease. The idea of the Dutch disease is that a constant (costless) inflow of foreign currency may have adverse effects, as they often cause resources to be directed from production of tradeables towards production of untradeable goods. The resulting increased competition for domestic inputs make production costs increase in both sectors, and on impact the terms of trade deteriorate. Over time, the downscaling of the competitive industry may also have additional negative effects on the competitiveness, as human capital formation usually depends on the general level of activity (learning-by-doing effects).

Figure 4.2 Per capita net official transfers in 1991 (US$)

Figure 4.3 summarizes the economic growth performance for the ten countries over the 1980's. And again the winner is Botswana. With an annual growth rate of 10% in both halves of last decade, Botswana has enjoyed an enviable

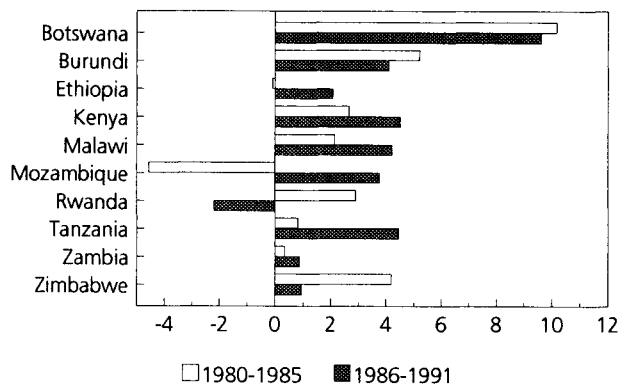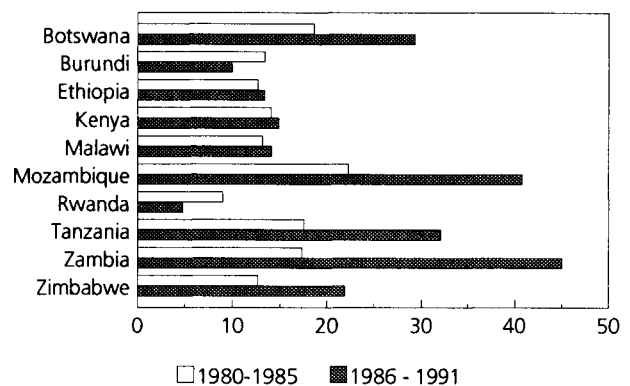Figure 4.3 Average annual GDP growth (%) 1980-1991

Figure 4.4 Average annual monetary growth (%) 1980-1991

rate of economic development. Burundi has also had stable and satisfactory growth rates over all twelve years, but the level at which this country still struggle still makes it transfer-deserving (cf. fig 4.2). The most dramatic turnaround seems to have taken place in Mozambique, where an average growth rate of —5% during the period 1980–1985 has been transformed to a positive average annual growth of about 4% over the last half of the 1980's. As we saw in the last chapter, this development is about to stagnate, but the prospects for post-war Mozambique should still be promising. Ethiopia, Kenya, Malawi, and Tanzania are other countries where the economic development seems to have been accelerating over the last decade.

Rwanda reveals a somewhat bleak pattern in figure 4.3, as the turnaround for this country has the wrong sign. From a steady annual growth of almost 3%, the GDP growth has stagnated, and over the last half of the 1980's domestic production has fallen by more than 2% a year. For Zimbabwe, the situation is comparable to that of Rwanda, as the GDP growth rate has fallen from 4% to 1% over the period. Zambia has been a typical on/off adjustor, and the absence of a significant turnaround in production must be analyzed with this feature in mind.

4.3 Monetary growth and inflation

As pointed out in chapter 2, monetarists tend to stress the links between the money supply mechanisms and inflation. This section reports the actual figures on the subject for our sub-Saharan panel. Figure 4.4 illustrates the annual growth in money supply over the period. The applied definition of the money supply is broad, including all monetary and quasi-monetary liabilities of the country's financial institutions to residents other than the central government. In spite of the efforts made by the International Monetary Fund and the World Bank, only two of the countries of our sample have actually reduced the growth in the money supply over the 1980's. These countries are Burundi and Rwanda. All the other countries report a higher growth in
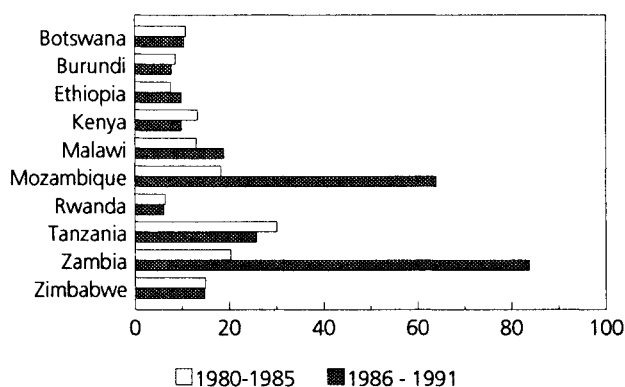
the money supply over the last six years than over the first six-year period.

Ethiopia, Kenya, and Malawi seem to have had a very moderate acceleration in the growth of the money supply. For all the other countries the growth in the money supply has increased significantly over the 1980's. Mozambique stands out with the highest monetary growth rate for the first half of the decade, and the second highest rate of growth during the last period. Only Zambia has experienced a more dramatic acceleration in the monetary growth rate than Mozambique. Along with Tanzania, Zambia, and Zimbabwe, the monetary growth has also been extraordinary in Botswana. However, for Botswana an accompanying growth in production seems to have suppressed the inflationary impulses of the money supply. Thus the growth in the money supply poses a threat to inflation primarily if the levels of production have stagnated, as confirmed by figure 4.5.

Figure 4.5 reports the average growth in the consumer price index, or in other words, the average annual rate of inflation for our panel of sub-Saharan countries. In figure 4.5, six out of ten countries seem to have reduced their annual rates of inflation over the 1980's. This is somewhat in contrast with figure 4.4, where only two out of ten countries have reduced their annual monetary growth over the same period. Tanzania is an example, revealing a dramatic increase in the monetary growth rate in figure 4.4, whereas the rate of inflation seems to be reduced over the decade.

Not surprisingly, however, most of the countries characterized by high rates of inflation are also countries with high rates of monetary growth and/or low growth in production. Thus, Mozambique is one of the countries with very high inflation, especially over the last sub-period. However, the immediate impression is that the monetary growth and the growth of production do not suffice to explain the sharp increase in inflation rates in Mozambique towards 1990. Annual average rates of inflation have risen from 20% to
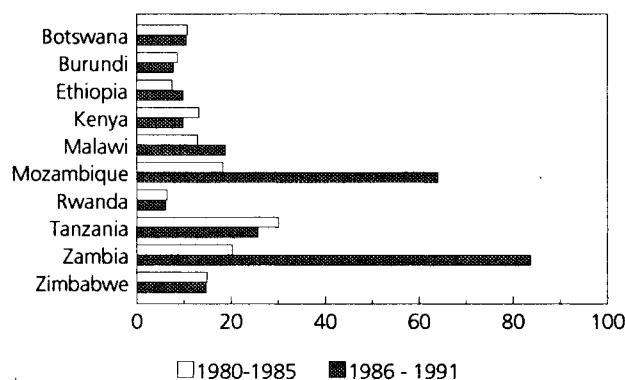
Figure 4.5 Average annual inflation (%) 1980-1991

□1980-1985 ■1986 - 1991

Figure 4.6 Average annual nominal lending rates 1980-1991

□1980-1985 ■1986 - 1991

Figure 4.7 Average annual real lending rates 1980-1991

□1980-1985 ■1986 - 1991

63%, monetary growth by half this distance, whereas the growth in production has increased sharply. Thus, the rapid inflation in Mozambique over the last part of the 1980's seems to need supplementary explanations in addition to the growth rates of money supply and production. Zambia is another country where inflation has increased dramatically over the 1980's. This corresponds well with the message from figure 4.4, where the highest monetary growth rate over the last sub-period is reported for Zambia. Somewhat more striking is the inflation performance in Zimbabwe. In spite of an increasing monetary growth rate and stagnating GDP growth, Zimbabwe reports a decreasing rate of inflation.

Figures 4.4 and 4.5 illustrate some important problems about macroeconomic analysis for developing countries. Combined with the general growth performance, the figures shed some light on the macroeconomic relationship between the growth in production, the growth in the money supply, and inflation. On the other hand, the tendencies are weak and unstable, implying that firm conclusions under no circumstance can be drawn.
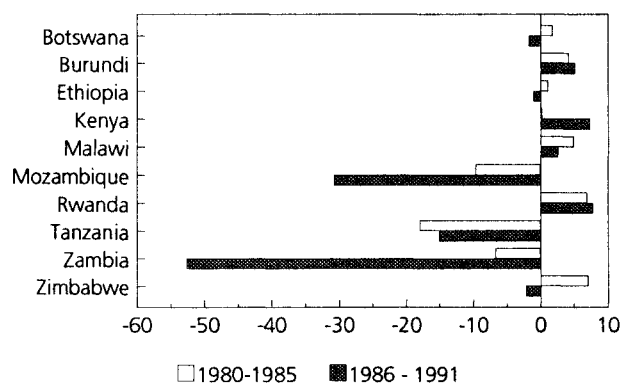
4.4 Interest rates

Chapter 3 gave a brief comment on the rationale for financial sector reforms in developing economies. These are designed by the multilateral donors in order to improve the quality and efficiency of the financial system. As we have seen, the lifting of interest rate regulations is an important element of these financial sector reforms. Figure 4.6 reports average nominal lending rates for our ten sub-Saharan countries. For half of the countries in the sample, there has been a sharp increase in nominal interest rates over the 1980's. These are Kenya, Malawi, Mozambique, Tanzania, and Zambia. Two countries (Burundi and Rwanda) reveal insignificant variation over the ten-year period, whereas three countries (Botswana, Ethiopia, and Zimbabwe) have reduced their nominal lending rates. However, as most economic agents respond to real interest rates, figure 4.6 is limited to illustrating the actual action taken to deregulate nominal interest rates.

The impact of deregulation and the macroeconomic policies on real interest rates are examined in figure 4.7. The real interest rates are calculated by subtracting the rate of inflation from the nominal interest rates illustrated in figure 4.6, and these measures provide a measure of the real cost of credit, as inflation over time will reduce the value of a given amount of credit. According to figure 4.7, only two countries have seen an increase in the cost of credit over the whole period. These are Kenya and Tanzania. The real cost of credit seems to have fallen for the rest of the countries from the first to the second sub-period.

The point of establishing *positive* real interest rates is often underlined in the financial sector reform programmes. Figure 4.7 illustrates that seven countries seem to have had positive real interest rates over the first half of the decade, whereas this number is reduced to four over the second sub-

period. Again, Mozambique and Zambia stand out at the bottom of the scale, with negative and falling real interest rates over the whole period, in spite of the fact that nominal interest rates have escalated sharply during the decade in both these countries.

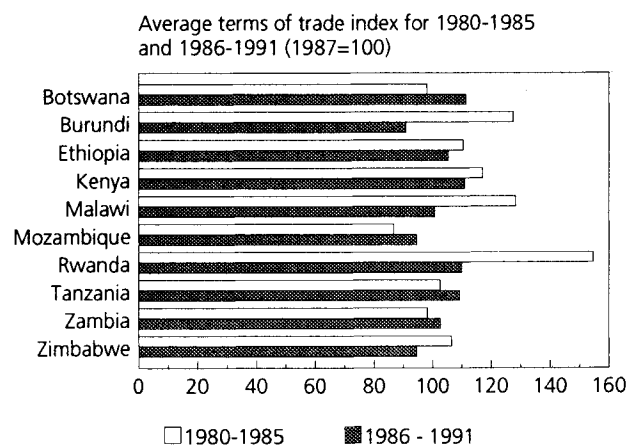## 4.5 Terms of trade and the current account

A characteristic element of almost every structural adjustment program is the outward orientation of economic policy. Rapid devaluations of the currency are undertaken to improve the competitiveness, again increasing exports, and increasing the ability to pay for imports. The terms of trade are defined as export prices compared with import prices, and thus they measure the ratios at which the exports of one country will exchange for those of its trading partners. For small open economies, the terms of trade are exogenously fixed by world market prices, at least for a constant pattern of trade. But the terms of trade may be increased if the trade pattern is adjusted to facilitate an improved exploitation of comparative cost-advantages. When calculated as the ratio of a country's index of average export prices to the average import price index, the result is an index for the terms of trade.

In figure 4.8 such an index forms the basis for the reported terms of trade adjustment. An increase in the reported index means an improvement in the terms of trade. Thus, for six out of ten countries figure 4.8 implies a deterioration in competitiveness.

This worsening in the terms of trade is most significant for Burundi, Malawi, and Rwanda, while Ethiopia, Kenya, and Zimbabwe seem to have experienced more moderate negative changes in competitiveness. Botswana is the only country where the improvement in the terms of trade is significant. However, a moderate improvement in the terms of trade is also observed for Mozambique, Tanzania, and Zambia. Figure 4.9 illustrate how the current account has developed over the 1980's. The reported current account is the sum of net exports of goods and non-factor services, net factor service income, and net private transfers.

Botswana again reveals the most striking pattern, with a significant improvement in the balance of the current account over the decade. From an average annual deficit of about 12% of GDP, the current account of Botswana has turned into an average annual surplus of 10% of GDP. This trend is shared with Zimbabwe, which also seems to have turned the current account deficit into a modest surplus during the 1980's. These are the only countries reporting an annual average current account surplus over the period 1986 - 1991. However, there are some other countries that have improved their situation by reducing the surplus. Among these are Ethiopia, Malawi, Rwanda, and Zambia. The rest of the sample report an increased current account deficit over the 1980's. Together with Tanzania, Mozambique represents the most serious deterioration. For Mozambique, the average annual deficit has increased from 18.5% to 49% of GDP. Whatever the explanations are for this development,

Figure 4.8 Terms of trade adjustment 1980-1991

Average terms of trade index for 1980-1985 and 1986-1991 (1987=100)

the economic policy of the 1980's can hardly be claimed to have improved the medium-term balance of payments situation of the Mozambican economy.

The presentation of the data set has been rough, leaving for the reader to draw conclusions regarding the implications of structural adjustment. Generally, however, it seems that the structural adjustment policies has succeeded only partially in achieving their primary goals of reduced monetary growth, improved terms of trade, reduced inflation, increased real interest rates and economic growth. Further, there is a certain tendency that countries with relatively high monetary growth are better off than countries with comparably low growth in the supply of broad money. To be able to test these conclusions in a more rigid framework, the next chapter applies econometric methods to the data set presented above.

Figure 4.9 The current account as percentage share of GDP 1980-1991

Annual average 1980-1985 and 1986-1991

5. Testing the impact of policy change

5.1 A heuristic model of growth

The analysis in this chapter applies a more rigid method to analyze the data set presented in the previous chapter. More precisely, the aim is to establish relations between output growth and various explanatory variables. Hopefully, this will reveal a bit more of how the change in selected macroeconomic indicators has influenced the evolution of the gross domestic product over the twelve-year period from 1980 to 1991. Econometrics provides us with a scientific method in which the tools of economic theory, mathematics, and statistical inference are applied to economic phenomena. This enables us to fit mathematical models to a given set of real world observations of the macroeconomy.

With macroeconomic time series for ten countries over a twelve-year period, the total number of observations is 120. This should suffice to test some simple but stringent hypotheses concerning macroeconomic policy in the countries of our sample. The applied mathematical relations must be general, in order to capture effects which are common to the ten countries. However, as this study must be regarded as introductory and cursory, the outline must necessarily be rather sketchy. A reasonable point of departure seems to be to explain the evolution of gross domestic product. This corresponds to explaining the growth rate of the economy for the ten countries of our panel. Thus, the dependent variable of the below analysis is the rate of change in the gross domestic product.

The next step is to select the independent, or explanatory, variables. In concordance with the previous chapter, we would like to test whether the most typical features of the structural adjustment programme have contributed to the growth in the gross domestic product. Ideally speaking, this would require an exhaustive set of empirically-based behavioural relations for the economy. As the scope of this work is limited, we will have to go about the problems in alternative way.

A kind of heuristic approach has become quite typical when the impact of structural adjustment is to be estimated by econometric methods. Rather than specifying a full-blown macroeconomic model, economists try to identify factors which have affected the growth potential in the countries

which are studied. The World Bank reports reviewed by Summers and Pritchett (1993) draw in part on such methods, and recent work published in international journals confirm a growing consensus on this kind of methodology.

Faini et al. (1991) offer a statistical analysis based on pooled time series for 93 developing countries, and the aim is to identify the existence of a turnaround in macroeconomic indicators between the two periods 1978–1981 and 1982–1986. Stylized models are estimated where the change i performance indicators are taken to depend on autonomous policy changes, changes in the external environment, and on participation in IMF-World Bank adjustment programs. After controlling for initial conditions and external factors, Faini et al. (1991) find no evidence of a statistically significant improvement in macroeconomic performance among loan recipient countries. However, the time span of their analysis is short, suggesting that improvements may still occur.

Morley (1992) applies a similar set of methods to analyze the effects of devaluation during stabilization programmes in developing countries. Based on pooled time series for 28 developing countries during the period 1973–1990, Morley (1992) estimates a simple relationship between the capacity utilization of the economy and different fiscal and monetary variables, including the real exchange rate. This study suggests that devaluations of the currency have significant negative effects on the volume of production. Further, it is argued that the process by which this link takes place is sluggish, as the effect of devaluation takes two years to materialize.

King and Levine (1993) represents a recent work in which the links between the financial sector and the real sector are investigated by means of econometric methods. Using a panel data set for about 80 countries from 1960 through 1989, King and Levine (1993) study whether higher levels of financial development are associated with economic development. Regressing long-run per capital GDP growth against a variety of financial indicators, it is concluded that the levels of financial deepening are strongly and robustly correlated with the general potential for economic develop-

ment. Further, it is argued that the financial variables are able to predict the subsequent values of the growth indicators. From this, King and Levine (1993) conclude that there is a clear *causality* between financial and real development, but this conclusion is strongly contested by other economists in the field (e.g. Lucas [1988]).

These three example should illustrate that the below model relates to a certain heuristic tradition within empirical development economics. The next step is to pick the macroeconomic indicators which are suspected to have influenced the rate of economic development in our ten sub-Saharan countries. At the same time, these must be factors which may be (and have been) manipulated by economic policy, or more specifically by the structural adjustment programmes. Typical targets of the structural adjustment programmes include the rate of monetary expansion, outward orientation, the exchange rate, the inflow of capital, and the interest rates.

First, we would like to include some sort of monetary variable, as structural adjustment programmes typically include rather strict controls with the money supply. A broadly defined money supply can be taken to reflect the amount of domestic credit to the economy. Financial markets characterized by credit-rationing and interest rate regulations provide a direct link between the money supply and the volume of domestic credit because of the direct monetary transmission mechanism through the banking system. In addition, credit plays a special role in the production technology in developing countries, being the only source of external finance. This means that monetary policy might have a stronger impact on the level of economic activity in developing countries than in industrialized countries. The monetary variable of our model is approached through a broadly defined money supply (M_t), including all monetary and quasi-monetary liabilities of a country's financial institutions to residents other than the central government.

Second, our analysis should include a variable which reflects the outward-orientation of almost every structural adjustment programme. The terms at which a country participate in the international markets for goods are important to the growth potential for the economy as a whole. The terms of trade index reported in World Tables (T_t) is therefore included as an explanatory variable in the below simplified model of output growth. For a small open economy, the prices of exports and imports are fixed by the world market, and for given exports and imports, the level of the terms of trade index will therefore be out of reach. However, structural adjustment implies an adjustment also in the countries' trade with the rest of the world, and exports and imports are therefore not constant. Accordingly, appropriate policy measures may be applied to restructure exports and imports, and this will push the terms of trade index upwards.

Third, we analyze the growth impact of changes in the nominal exchange rate. As illustrated in chapter 2 and 3, rapid devaluations of the domestic currency are almost pivotal to the structural adjustment programs for sub-Saharan

Africa. This is done to neutralize the effect from domestic inflation on the international competitiveness. However, the real world effects of devaluations in developing countries are strongly debated. As mentioned in chapter 2, devaluations may have contractionary effects in developing countries. These effects are especially due to the crucial role of imported inputs. To investigate whether devaluations seem to have influenced on the growth and level of GDP, the nominal exchange rate (E_t) is also included as an independent variable in the below model.

Fourth, our investigation should also allow for positive growth effects from capital inflow. It is often claimed that development aid has significant short-term beneficial effects because it increases the import capacity of the economy. Imports are of extreme importance for the production technology, especially for manufacturing industries. Annual net official transfers (F_t) are included to capture the effects on domestic production originating from the inflow of development aid.

Finally, the model should incorporate some of the ideas from the financial development literature. Financial sector reforms are present in most structural adjustment programmes, and these include a set of policy measures. Deregulations of the credit markets are intended to smooth the flow of funds from savers toward real investment. At the same time, credit is the only source of external finance for the producers, and liberalization of interest rates there implies an increase in the costs of finance, and the marginal costs of production. Nominal interest rates (R_t) are introduced to test these hypotheses in an empirical framework.

In standard macroeconomic approaches, the effects of all these monetary variables are closely interrelated, and isolated effects on the gross domestic product are therefore normally difficult to identify. For example, the effects on economic activity from interest rate changes are usually closely correlated with the effects of general monetary factors, such as capital inflow, exchange rates and monetary growth. Thus it would be hard, not to say impossible, to isolate interest rate effects from other monetary effects in a model of this type for an industrialized country with competitive markets for money and capital.

However, the access to domestic and international financial markets has been strictly regulated in all the countries of our sample. Access to official domestic credit have traditionally been restricted by credit ceilings and interest rate regulations, and these are generally under public control. Markets for foreign exchange have also been administered over the entire period, as the exchange rates have been fixed, and determined by the central bank according to ruling principles of economic policy. In addition, official markets for foreign exchange have been close to absent, and the distribution of this rationed asset has been undertaken by the public administration. The problems concerning endogeneity and simultaneity may thus not be too severe when we deal with data for developing countries, like the ones in our

sample. It follows that a simplified short run model of growth for this kind of countries may include monetary growth, exchange rates and interest rates as explanatory variables.

The listed set of variables does not at all constitute an exhaustive set of macroeconomic growth factors. Of course, this study neglects a number of interesting magnitudes which are suspected to influence the rate of economic growth. Recent works of economic growth has pointed out the importance of human capital formation (e.g. Lucas [1988, 1993]), and it would therefore be of interest to include a variable to account for the variation over countries, and over time, in the change and level of education. However, the different reported school enrolment ratios show little variation over time, and therefore they are likely to be correlated with the constant term of our estimated models. There is also a serious lack of data when this information is to be gathered for the ten countries of our panel.

Another variable that may have interest is the public budget deficit. In the short run, one would expect that an increase in the budget deficit would stimulate aggregate demand, but the long run effect is often claimed to be adverse with respect to economic growth. Unfortunately, the sources of the data set are not generous enough to let us include the budget deficit as an explanatory variable.

5.2 Econometric specification

The next step is to specify the relationship which is to form the basis for the econometric estimation. Our model include the real gross domestic product as a dependent variable. The explanatory variables are the money supply (M_t), a terms of trade index (T_t), the nominal exchange rate (E_t), annual net official transfers (F_t), and the nominal interest rate (R_t). As a point of reference, we assume that a long-run economic relationship exists between the level of the gross national product and the independent variables introduced above. The idea is that any long-run real national income level (Y_t) is associated with a specific level of the above listed independent variables through a long-term equilibrium structure.

This long-run relationship may be stated generally as:

(11) $Y_t = g(M_t, T_t, E_t, F_t, R_t)$

where $g(\cdot)$ is the mathematical correspondence between the long-run level of the gross domestic product and the exogenous policy variables. For competitive economies, monetarists would typically claim that the influence of monetary factors on this long-run equilibrium is zero ($g'_M = 0$). An improvement in the terms of trade are likely to have positive influence on evolution of GDP ($g'_T > 0$), while the effects of devaluations are strongly debated

($g'_E = ?$). To the extent that the recorded net official transfers embodies the variation in the inflow of development aid, the effect on the national income is usually assumed to be non-negative ($g'_M \geq 0$). Deregulating the financial sector means a liberalization of interest rates, and this is assumed to be growth promoting ($g'_R > 0$). Our results will hopefully enable us to draw conclusions regarding the extent to which these general results seem valid for the developing economies of our data set. For simplicity of exposition and to facilitate a convenient interpretation of the results, the explicit formulation of the above function is characterized as multiplicative:

(12) $Y_t = A M_t^{\alpha_1} T_t^{\alpha_2} E_t^{\alpha_3} F_t^{\alpha_4} R_t^{\alpha_5}$

where A is a constant term. Equation (12) now implies that the α_j's ($j = 1, 2, 3, 4$) can be interpreted as partial elasticities, representing the percentual change in national income accompanied by a one per cent increase in the actual independent variable. Furthermore, this functional form is especially convenient for simple econometric analysis (ordinary least squares), where linearity in the parameters is a required property for estimation of the parameters. We now may transform equation (12) to read:

(13) $y_t = \alpha_0 + \alpha_1 m_t + \alpha_2 t_t + \alpha_3 e_t + \alpha_4 f_t + \alpha_5 r_t$

where $\alpha_0 \equiv lnA$ and small types generally represent the natural logarithm of the corresponding capitals ($x_t \equiv lnX_t$). Equation (13) represents the long-run relationship of our model, and may describe theoretical phenomena pretty well. However, the real world is typically characterized by shocks and rigidities, to which the economy must respond continuously. The process by which our data set was generated will typically reflect these dynamics, and equation (13) will have limited value when real-world phenomena are to be described. What is required is therefore a dynamic model which implicitly encompasses a long-run economic relationship like the one in equation (13).

This need is met by the error-correction model, where the change in the left-hand variable depends on changes in the explanatory variables in addition to a so-called error-correction term (Engle and Granger [1987]). The error-correction term reflects the deviation from the lagged long-run equilibrium of equation (13). Accordingly, this variable's parameter, the error-correction coefficient, reflects the share of the deviation from the long-run equilibrium which is equilibrated in every period. Thus, the error-correction coefficient serves as a measure of the sluggishness in the dynamic process behind the data set. Letting $_t$ denote the percentual change over time in the variable X_t, and introducing u_t as white empirical noise, the empirical error-correction formulation corresponding to equation (13) is given by:[1]

---

1   Formally, the relative time derivative is defined by:

$$\dot{x}_t \equiv \frac{dX_t}{dt} \cdot \frac{1}{X_t} \equiv \frac{d \ln x_t}{dt}$$

(14) $\dot{y}_t = a_0 + a_1\dot{m}_t + a_2\dot{t}_t + a_3\dot{e}_t + a_4\dot{f}_t + a_5\dot{r}_t + \lambda ecm_{t-1} + u_t$

where λ is the error-correction coefficient, and ecm_t is the so-called error-correction mechanism, defined by:

(15) $ecm_t = y_t - [\alpha_0 + \alpha_1 m_t + \alpha_2 t_t + \alpha_3 e_t + \alpha_4 f_t + \alpha_5 r_t]$

We are now ready to formulate the estimated econometric equation, from which both short-run and long-run effects may be derived. Letting subscript i denote the different countries of the sample and introducing α_{i0} country-specific fixed effects, the econometric equation which is estimated is given by:

(16) $\dot{y}_{it} = a_{i0} + a_1 \dot{m}_{it} + a_2 \dot{t}_{it} + a_3 \dot{e}_{it} + a_4 \dot{f}_{it} + a_5 \dot{r}_{it}$

$+ b_0 y_{it-1} + b_1 m_{it-1} + b_2 t_{it-1} + b_3 e_{it-1}$

$+ b_4 f_{it-1} + b_5 r_{it-1} + u_{it}$

The coefficients of the differentiated variables may now be interpreted as short-run effects of shifts in the macroeconomic policy, whereas the level-effects are more closely connected to the underlying long-run equilibrium. Indeed, from an estimated version of equation (16) estimates for the long-run parameters of equation (13) can be derived as:

(17) $\hat{\alpha}_{i0} = -\dfrac{\hat{\alpha}_{i0}}{\hat{b}_0}$ $\quad \forall\ i$

$\hat{\alpha}_j = -\dfrac{\hat{b}_j}{\hat{b}_0}$ $\quad j = 1,2,3,4,5$

Consequently, the specification in equation (16) opens for both short-run and long-run effects originating from shifts in the explanatory variables. This concludes the general formulation of an econometric model, and we now turn to the estimated results.

5.3 Estimation

The data set is transformed to fit the formulation of equation (16), and the relation is then estimated by ordinary least squares. Different versions of the model are tried out, and a small subset of the estimated models is presented in table 5.1.

The first four lines of the table contain the effects of differentiated exogenous variables, and may be interpreted as short-run elasticities. Then there are five lines for lagged level-effects, followed by the common constant term. Country-specific fixed effects are captured by the last ten lines of table 5.1, and the abbreviations correspond to those defined in section 5.1. We will first comment on the technical differences between the versions of the model, before re-

Table 5.1 Estimated growth impulses Dependent variable: GDP growth (y_t), estimation method: Ordinary Least Squares.

Variables	Model 1	Model 2	Model 3	Model 4
$\dot{m}_{it}$	0.07***	0.04	0.05**	0.05**
t_{it}	0.01	0.01	0.01	
$\dot{e}_{it}$	-0.01	-0.01	-0.01	
f_{it}	0.00	0.01	0.00	
r_{it}	-0.24	-0.21	-0.24**	-0.25**
$y_{i\,t-1}$	-0.14***	-0.11***	-0.13***	-0.11***
$m_{i\,t-1}$	0.02*	0.02	0.03***	0.03***
$t_{i\,t-1}$	0.04**	0.04**	0.04***	0.04***
$e_{i\,t-1}$	0.00	-0.00	-0.01	
$f_{i\,t-1}$	-0.00	0.01	0.00	
r_{it-1}	0.00	0.07	0.06**	0.05**
CONST	0.39	-0.14		
BWA		0.07***	0.07***	0.07***
BDI		0.02	0.02**	0.02**
ETH		-0.00		
KEN		0.01	0.01**	0.01**
MWI		0.00		
MOZ		1)		
RWA		-0.01		
TZA		0.01		
ZMB		-0.01		
ZWE		0.01		

R^2=0.49	R^2=0.60	R^2=0.59	R^2=0.59
$F_{(12,\ 98)}$ =7.1	$F_{(21,89)}$ = 6.44	$F_{(14,\ 96)}$ =9.9	$F_{(9,\ 101)}$ = 15.9
s.e. = 0.041	s.e. = 0.037	s.e. = 0.036	s.e. = 0.035
$\chi^2(2)$ = 2.6	$\chi^2(2)$ = 7.1	$\chi^2(2)$ = 9.2	$\chi^2(2)$ = 7.2

*** Significant at 5% level.
** Significant at 10% level.
* Significant at 10% level with a one-tailed test.
1) Mozambique serves as the point of reference in this model.

sults concerning economic effects and policy implications are discussed more thoroughly.

The first model excludes any variation between the countries of the sample, except due to the included explanatory variables, as all country-specific constant terms are left out. The constant term of the model may be interpreted as the autonomous rate of growth, or the rate of evolution in the gross domestic product which cannot be attributed to any of the other explanatory variables. Thus, model 1 implicitly assumes that the degree to which variation in the explanatory variables explains changes in aggregate output is identical between the ten countries.

There may, however, be constant country-specific effects that have affected the economic growth potential over the 1980's. To take one example, the mineral resources of Botswana may have improved the general economic climate relative to the other nine countries. Another example is the variation over countries in the educational level of the population. This must be assumed to influence the variation in

the growth rates between the countries. A crude measure is introduced in model 2 to control for such country-specific variations in the autonomous rate of GDP growth.

Model 2 incorporates all the effects of equation (16), and may thus be referred to as the full-blown version of our simple model of economic growth. This model includes a maximum of variables in addition to the country-specific constant terms. The constant term is allowed to vary over the countries in the sample to isolate the growth effects of the four ordinary independent variables. To be able estimate the model by econometric methods, one of the country-specific constant terms had to be left out. Therefore, in the second model Mozambique serves as a reference country from which all the other country-specific constant terms are measured as deviations. However, the results from this second step of the procedure indicates that quite a few of the country-specific fixed effects do not deserve their position in the model, as they do not deviate significantly from zero. The next step therefore excluded the insignificant country-specific dummy variables as well as the common constant term, leaving us with the results of the third column of table 5.1.

The last step of the estimation procedure was to exclude also the ordinary explanatory variables which do not seem able to contribute significantly to the explanation of the rate of economic growth. The result is the "final" version of the model, and this is reported in the far-right column of table 5.1. In this preferred version of the model, the selection of country-specific fixed effects reflects the statistical significance of such effects, and so does the included explanatory variables.

The establishment of the estimated econometric equation may thus be divided into four steps: the estimation of the general version of the model, the estimation of the full-blown model, the selection of country-specific fixed effects, and finally, the selection of ordinary explanatory variables. We have started from a general specification and repeated estimation has brought the model closer to a more specific and restricted form. This is in consonance with general principles of econometric modelling of time series.

In evaluating the different versions of the model, we have utilized some statistical diagnostics, and these are reported in the bottom line of table 5.1. The first indicator of the validity of the model is the R^2, measuring the proportion of the total variation in the dependent variable that is explained by the estimated model. None of the estimated models are able explain more than 60 per cent of the variation in the data set, as measured by the reported R^2. The interpretation of the results should therefore be exercised with cautiousness. Second, the reported F-statistic indicates the joint statistical significance of all the estimated parameters. The null-hypothesis that all estimates are jointly equal to zero is rejected for all the reported models. Third, the standard error of the estimation is reported. The standard error of the regressions are quite high, but as we are working with

panel data for developing countries, one must expect quite a bit of unexplained variation. Fourth, a χ^2 test statistic is computed to test whether the residuals are normally distributed. Due to outliers, this hypothesis of non-normality is rejected only for model 1. All these diagnostics have been used in the gradual approach of the final preferred model, and except from the Jarque and Bera (1980) test of normality, they have all improved during the procedures of estimation. Statistical significance and a sign in accordance with hypotheses in development economics should indicate the relevance of the included variables, but the absolute size of the different coefficients must be interpreted with care. Further, econometric models that combine macroeconomic time series for different countries can not easily be taken to represent appropriate behavioral economic relationships. However, the estimated effects in table 5.1 tell us something about the partial correlations between economic growth and different other macroeconomic indicators.

5.4 Discussion of results

All results will be commented using model 4 as the central reference. The other models of table 5.1 serve to illustrate the procedures of estimation, where the aim has been to find the model that describes the data-generating process in the best way. On this background, model 4 seems preferable so far. Below, the different elements of the model are discussed, starting with the country-specific constant terms. The estimated effects of changes in the broad money supply, the terms of trade, devaluations of the domestic currency, net official transfers, and nominal interest rates are then clarified. Finally, estimates for the underlying structural model are presented to shed some light on the long-run underlying equilibrium, on which the growth model is conditioned.

Country-specific fixed effects

The constant terms of the model are allowed to vary between the countries of the sample. Mozambique serve as the point of reference in model 2, and the country-specific fixed effects are measured as deviations from the constant term for Mozambique (estimated to be zero). In model 4, fixed growth effects are appended for three countries. The estimated fixed country effects include both positive and negative coefficients. However, this does *not* automatically mean that the growth rates vary according to the sign of these fixed effects. Rather, the fixed effects are meant to isolate constant country-specific growth factors apart from the included explanatory variables.

For all the countries of the sample there are many growth-explaining variables that are left out of our model. If the sum of these effects has been somewhat constant over the estimation period, they are captured by the constant terms. Thus, the fixed effects give a hint of how large proportion of the variation in growth rates that cannot be explained by variation in the ordinary explanatory variables of the model. Thus they may be interpreted as some kind of "autonomous" rates of growth. For Ethiopia, Malawi, Mozambique, Rwanda, Tanzania, Zambia, and Zimbabwe, the estimated

fixed-effects do not seem significantly different from zero, and therefore, (the average of) these countries serve as the point of reference for model 3 and model 4. For the three other countries of the sample there seem to be excluded constant growth-factors that produce a significantly higher rate of growth than for the rest of sample over the period. The idea may be illuminated by the case of Botswana, where the autonomous growth rate seem to be 5.5 percentage points higher than for the other countries, e.g. Mozambique. This suggests that Botswana may be an economy that is quite different from the Mozambican economy, and that all the impulses to growth are not directly comparable for these two economies. The variation exposed in the figures of chapter 4 seem to support this impression. Following the same line of reasoning, Ethiopia, Malawi, Rwanda, Tanzania, Zambia, and Zimbabwe seem to be economies where the mechanisms of economic development to a larger extent are comparable to those of Mozambique.

Broad money

According to table 5.1, monetary growth seems to have had a significant, but very modest, positive effect upon the change in the gross domestic product over the 1980's. The estimated short-run elasticity of broad money is positive and relatively significant, but perhaps not as stable as we ideally would like to see it. In the preferred model, monetary growth has a positive estimate of about 0.05, and this estimate is significantly positive at a 10% significance level. This implies that it is likely that an expansion in the volume of domestic credit has moderate positive effects on the real rate of growth in the short run. On the other hand, this result also implies that contractions of the monetary base are likely to cause the gross domestic product to fall in the short run. However, the coefficient of the lagged level of broad money has even more interesting characteristics. The partial level-effect of domestic credit is highly significant in our final specification, and seems quite robust to the different versions of the growth model. This suggests that there exists a significant positive correlation between nominal money growth and the gross domestic product also in the medium term. Thus, our data set lends support to the hypothesis that changes in the volume of domestic credit are positively correlated with the change of the national income level. This reflects the observation that countries in our sample which can show a relatively advantageous growth performance usually also have monetary growth rates higher than the sample average (cf. chapter 4).

As mentioned above, the estimates concerning broad money suggest that the set of monetary constraints which usually accompany the structural adjustment programmes might have contractive effects on the economic growth potential of the countries of our sample. This analysis suggests that the monitoring of monetary growth should be exercised with modesty if medium-term economic growth is the primary target of the macroeconomic policy. A tempting conclusion is further that the multinational donor community concern with monetary control has been exaggerated, but as the estimated effects of our model are very small, it is diffi-

cult to draw clear-cut conclusions. We should also remember from chapter 2 that there is a strong link between monetary growth and inflation, and that inflation may have adverse effects which require separate treatment.

Terms of trade

Macroeconomic balance, fiscal restraint, and outward-looking policies are keywords of nearly all programs of structural adjustment. To test the importance of orientation towards international goods-markets, our model of growth include an index for the terms of trade. This index is extracted directly from World Tables 1992, and is intended to measure the ratio at which the exports of one country exchange for those of its trading partners. For small open economies, both export and import prices are determined internationally, and for given amounts of export and imports, the terms of trade are thus exogenous. However, the reported index is defined as the index of average export prices relative to the average import price index. Changes in *quantities* of exports and imports will thus influence on the terms of trade. An increase in the terms of trade may therefore be interpreted as a movement towards a trade equilibrium where comparative cost advantages are optimally exploited. This kind of structural adjustment is claimed to be of vital importance for the growth-potential of developing countries. Changes in the terms of trade index will therefore be applied to reflect general variations in the international competitiveness of the countries involved.

From table 5.1 we see that the immediate net effect upon the economic growth rate from a change in the terms of trade index is negligible. Therefore, this variable is excluded in the final specification of our model. However, the estimated level effect lies very stable at 0.04 in all the different specifications, and is highly significant in the final preferred model. More precisely, the estimate suggests that countries with improving terms of trade have performed systematically better than countries with constant terms of trade over the 1980's. Adjustment of the trade pattern therefore seems to be of vital importance for the medium-term growth potential, whereas the short-term effects of terms of trade adjustment seem to be of minor importance.

The exchange rate

A devaluation means that import prices rise relative to export prices. If domestic exporters are producing competitively and without rationing, this will normally bring about an increase in exports. However, a devaluation also implies that imports become relatively more expensive, and this effect should not be neglected, especially not in analyses of developing countries. As imports are of extreme importance in the production process in most developing countries, devaluations may have contractive effects via the supply side of the economy, because they tend to increase the marginal costs of production. This is stressed in a number of theoretical works on development economics, especially within the neo-structural macro critique (e.g. Bruno [1979], Krugman and Taylor [1978]), and is also pointed out by Cappelen

(1992) in a recent comment on the economic recovery plan in Mozambique.

Data for exchange rates are approached through the conversion factors reported by the World Bank (1992b). This conversion factor represents the annual average of market exchange rates for countries quoting rates in units of national currency per US$. Further, an index is constructed to be able to compare the evolution in the exchange rate between the different countries of the sample. Accordingly, an increase in this index of exchange rates will reflect a devaluation of the currency, making the interpretation of the estimated coefficients quite straight-forward.

The estimated short-run effect of changes in the exchange rate does not support the hypothesis concerning contractive effects of devaluation, at least when measured by the total net effect on GDP growth. An increase in E_t implies a devaluation of the nominal currency, and this seems to produce a modest, but statistically insignificant, negative effect on the rate of growth, as reported in models 1–3. This short run change in the exchange rate index is therefore excluded int the final preferred version of the model. The estimated level effect from changes in the exchange rate have similar properties, and is also excluded in model 4.

The preferred model in table 5.1 thus seems to suggest that the export-promoting effects of devaluations tend to balance the contractive effects due to an import intensive production technology. Seemingly, our estimated model of growth for ten countries in Sub-Saharan Africa thus lends only limited support to hypotheses concerning contractive effects of devaluation. However, there are certain statistical problems at this point of the analysis. Partial regressions suggest that the monetary growth rate is closely correlated with the rate of devaluation. The reason for this might be that monetary growth is used as an indicator of future inflation. As devaluations have been implemented to counteract the effects on the international competitiveness from domestic inflation, this will cause a close relationship between monetary growth and the exchange rate. This is a typical problem of econometric analysis, and is referred to as multicollinearity. The consequence of this property of the data set a low degree of precision in the estimated coefficients. For our estimated model it also implies that it will be hard to identify the isolated effects on the economic growth rate from changes in the money supply and adjustments of the exchange rates, respectively.

Net official transfers

Inflow of capital in the form of development aid is frequently claimed to have substantial growth-promoting effects on developing countries, but various contributions within the macroeconomic development literature now cast doubt on this earlier quite generally accepted conclusion (e.g. Cassen et al. [1986] and Pedersen [1991]).

As most of the countries in our sample are excluded from international credit on market-based terms, inflow of capital largely take place in form of subsidized credits and development aid. Short-term demand-side effects are likely to occur after changes in the net capital inflow of this type, but rent-seeking and other non-productive activities may squeeze out even the short-term effects of capital inflow. In the medium to long-term there are important effects from net transfers concerning macroeconomic structure and economic incentives (e.g. van Wijnbergen [1984]), and these may neutralize the growth impact of net transfers. The empirical evidence is, accordingly, ambiguous in this area. To test for the influence of development aid, net official transfers has been included in the estimated model.

Net official transfers comprise net transfer payments between governments of the reporting country and the rest of the world. As chapter 4 revealed, this variable takes on high values for Botswana. This suggests that the recorded variable may include more than official development aid. Botswana has generated international funds from their mining activities. If net official transfers include some of the interest payments from these funds, it would typically skew the distribution in favour of Botswana, as none of the other countries of the sample are likely to receive official interest payments from abroad. This should be held in mind when the results are interpreted.

Our estimated model of the far-right column of table 5.1 does not confirm either of the hypotheses concerning inflow of aid and economic growth. The estimated short-term effect from a change in net official transfers is positive, but very small, and not statistically significant, and is excluded in the final version of the model. The level-effect is more closely connected to the long-run equilibrium, but has similar properties, and is therefore also excluded in the preferred model 4. As measured by net official transfers over the 1980's, our model is thus not able to uncover influences from the inflow of development aid on the rate of economic growth.

At this point, the model does not seem appropriate for an explanation of the turnaround in Mozambique in 1987. As the inflow of donor funds increased dramatically due to the implementation of the ERP, growth rates turned significantly positive in Mozambique. Over the last seven years, this indicates a close relationship between the import capacity and the rate of economic growth. On the other hand, the potential for a turnaround seem to have been exceptional in Mozambique, due to the extraordinary macroeconomic, and security-related, conditions at the middle of the 1980's. Thus, the inflow of capital to Mozambique may have been far more effective for generating economic growth over the short to medium term than for the other countries. To the extent that these effects are temporal, they also shed some light on the stagnation that has taken place in Mozambique after 1990. Expansionary effects of development aid are likely to be relevant also for the other countries in the region, but our estimated model is not able to pick up these effects.

Interest rates

The nominal interest rate is included to account for two different aspects of the macroeconomy in developing countries. First, an increase in interest rates is likely to produce a contraction of the volume of production, because the immediate response of investment demand will be negative. This effect is identical to the one found in standard textbook expositions of IS/LM-analysis. Second, the interest rate is included to expose the effects from financial liberalization upon the rates of economic growth. We therefore hypothesize that interest rates have a negative short-term effect, whereas the long-run structural effect from increasing interest rates is positive.

The estimated immediate effect from an increase in the nominal interest rates is negative, fairly stable and very significant. This effect suggests a negative short-term growth impulse from an increase in the real interest rates. In magnitude, the effect seems to be far more dramatic than of a change in the broad money supply, and the estimate is also more precise. Thus our data set lends support to the notion that interest rates are negatively correlated with the level of production in the short-run. The level effect is also relatively stable, but not as significant as the short run effect of interest rate changes. More interesting, perhaps, is the fact that the estimated long-run effect has the opposite sign of the short-run effect. The effect of an increase in interest rates is thus expected to have a positive long-run influence on the rate of economic growth.

This long-run result contradicts the standard hypothesis of macroeconomic theory, but is well in line with the traditional literature of financial development (cf. Fry [1988]). In industrialized countries, the interest rate tend to be negatively correlated with the level of national output, also in the medium term. A reason is that competitive capital markets redirect financial capital towards investment demand in the case that interest rates should fall, and this contributes to an increase in aggregate demand. Things look quite different in representative developing countries.

First, the fixed interest rate ceilings place restrictions on the supply of loans, and the volume of outstanding loans is less than it otherwise would be. Second, the regulations of nominal interest rates usually imply low or negative real deposit rates, and therefore nobody wants to place their savings with the banking system unless for special reasons. Third, low interest rates tend to cause capital flight, because the domestic financial system can not compete with the international capital market. Fourth, rationing in official financial market almost inevitably give rise to grey or black markets for credit, rising the marginal costs of finance dramatically. Deregulations of the financial system is often claimed to mobilize savings, both domestic and foreign. Further, the banking system is affected, as financial resources can be supplied to more profitable projects at a higher interest rate. Accordingly, an increase in interest rates may cause an increase also in the gross domestic product, at least in the longer run.

The ideas that the real effects of interest rates changes have a credit-availability channel which is special for developing countries have been subject to theoretical and empirical research for decades (Mohn [1992]). Influential early theoretical contributions include McKinnon (1973) and Shaw (1973), and the literature on development economics has been quite seriously concerned with the role of the financial sector in the macroeconomy ever since (cf. Fry [1988]).

In an empirical study of macroeconomic investment behaviour in Greece, Voridis (1993) estimates robust and *positive* coefficients for user costs in his investment relations. This is claimed to reflect the expansionary effect from increasing interest rates on capital formation, again increasing the availability of loanable funds. In a more general model, using panel data for 80 countries, King and Levine (1993) also finds strong support for the hypothesis that financial development is positively correlated with the rate of economic growth. Hence, the above estimated growth model for Sub-Saharan countries can be taken to be in accordance with these two recent empirical works on related topics.

The structural model

As pointed out under the specification of the econometric model, specified growth model is conditioned on some underlying long-term equilibrium relationship through the so-called error-correction mechanism. The change in the gross-national product is thus assumed to continuously reduce the deviation from an underlying long-term structural equilibrium. The parameters of this underlying equilibrium are derived by assuming that all changes approach zero, and then solving for the dependent level variable. This solution for the long-run structural elasticities is illustrated formally by equation (17) above.

The estimates of the underlying long-run macro product function are derived according to equation (17), and the resulting structural elasticities are presented in table 5.2. As we see, the long-run elasticities are directly related to the estimates of the growth model via the estimated error-correction coefficient. As the adjustment towards the long-run equilibrium in table 5.2 is continuously hampered by the sluggishness of the error-correction mechanism, the

Table 5.2 Derived estimates for the structural parameters

Variable	Estimated structural elasticity
Broad money	0.18
Terms of trade	0.36
Exchange rate	0.00
Net official transfers	0.00
Interest rate	0.45
Error correction term	0.11

Dependent variable: GDP-level (Y_t)

presented structural elasticities can not be taken too lite-
rally. The bottom line of table 5.2 reports the estimated
error-correction coefficient. The estimate of 0.11 implies
that only 11 per cent of the deviation from the deviation is
corrected in each period, suggesting a moderate pace of ad-
justment.

All the estimated structural parameters are consistent with
the previously commented effects in the dynamic model.
Therefore, the below presentation of implications will not
include any further discussion of the structural parameters.
For broad money the long-run structural elasticity is esti-
mated at 0.18. This implies that a one per cent increase in
the supply of broad money will increase the gross national
product by 0.18 per cent. For the terms of trade index the
long-run elasticity is estimated at 0.29. Thus, the influence
of improving terms of trade on the level of GDP seem to
have been significantly positive over the 1980's for the
countries of our sample. On impact, changes in the nominal
exchange rate effect do not seem to have had significant ef-
fects on the evolution of gross domestic product, but the iso-
lated effects from devaluations are hard to identify, as they
are closely correlated with the growth in the money supply.

The inflow of net official transfers seems not to be corre-
lated with the level of GDP in the medium to long-term, a
result which resembles the conclusions of Faini et al. (1991)
in their econometric evaluation of growth-oriented adjust-
ment programs. As pointed out above, net official transfers,
however, may be a inappropriate proxy for the inflow of de-
velopment aid, which is the main variable of interest. The
last structural parameter is the long-run elasticity of the
nominal interest rate, and this is positive and twice the mag-
nitude of the elasticity of broad money. This is in accord-
ance with the discussion above, and the conclusions con-
cerning interest rate deregulation and inflation control are
thus maintained.

Some of our results indicate that shifts in economic policy
may have short-term contractive effects, while the structural
parameters are positive. Further, the sluggishness of the esti-
mated error-correction model indicates that it may take con-
siderable time for policy shifts to increase the level of na-
tional income. Confronted with the real world dilemmas of
development economics, this is an important piece of infor-
mation, because it implies a general call for patience in the
evaluation of macroeconomic policy reforms.

6. Simulations and policy experiments

6.1 Post-sample simulation

Any estimated econometric model should be subject to simple tests of validity, and some such tests may easily be constructed using the data set and the fitted equation. An illustrative and quite transparent test is to simulate the model using historical data, to see how well it describes the development which formed the basis for estimation. The Mozambican economy forms the point of reference for all the examples and simulations presented below.

To investigate the performance of our single-equation model, it is simulated using historical data for Mozambique over the period 1980 to 1991. Simulations on observations prior to 1986 revealed that for the early years of the sample, our model does not seem appropriate for explaining the growth in domestic production in Mozambique. The predictions for the beginning of the eighties were far higher than the observed economic development. This suggests that other factors influenced the rate of growth over this period than those embodied in our model. However, we must remember that we are simulating an economy at civil war. The general social and economic instability associated with the civil-war situation are likely to have caused rather erratic shifts in the level of economic activity, and these can naturally not be captured by our model. The predictive

Figure 6.1 Post-sample simulation for Mozambique 1986-1991

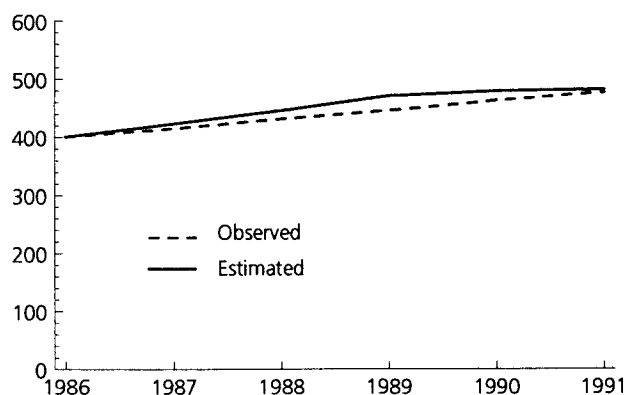Estimated and observed GDP (1987-prices). Mt.bill.

power of our equation, however, seem to improve considerably as the Mozambican government joined the multinational donor community, and initiated the first structural adjustment plan in 1987. For some of the last years of the eighties, our model projects rates of growth which are quite near the realized growth of the Mozambican economy. Thus the estimated model seem to capture quite a lot of the variation in gross domestic product. Somehow, the insecurity situation might have settled by this time, stabilizing the economy at a level reflecting all adverse effects of the civil war.

Figure 6.1 illustrates some one of the problems which were discussed at greater length in chapter 3. The first three years following the implementation of the ERP were characterized by positive and steady growth at an annual 4–5 per cent. Toward the beginning of the 1990's, the growth potential seems to have stagnated, and figure 6.1 illustrates that this stagnation can not be attributed to variation in the macroeconomic indicators of our simple model. Speaking in terms of our model, the recent delay of economic development in Mozambique remains unexplained. For discussions of ad hoc explanations, cf. chapter 3.

One may well object that the estimated model provides a rather dubious description of the macroeconomic growth rate during the last decade. However, one should take into account the fact that our model consists of only one equation. Further, the modest aim is to explain the economic mechanisms of a developing country at war, using only three macroeconomic indicators. In this perspective, the model's predictive power may nonetheless be approved of.
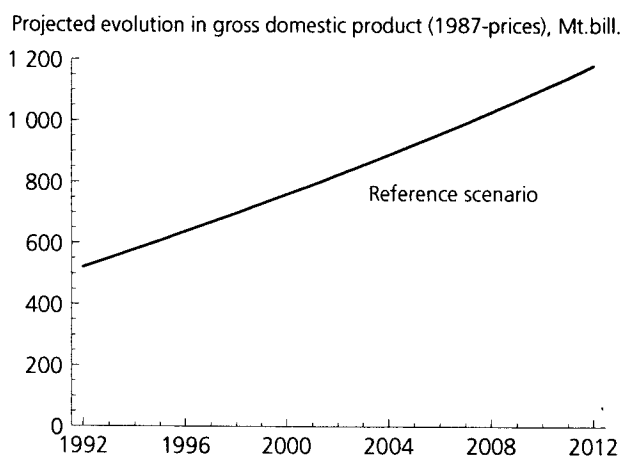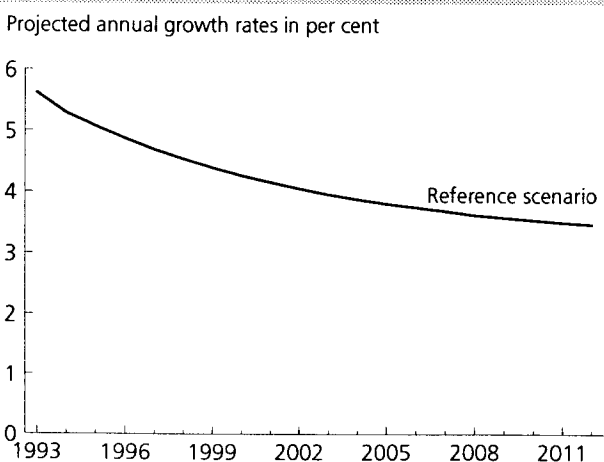
6.2 The reference scenario

In the following, we shall conduct some experimental projections of the macroeconomic level of activity and its response to policy-shifts, using the Mozambican economy as an example. The initial year of these simulations is 1993, and the model is calibrated to fit this year's observations perfectly. For the future years of our simulations, we need precise assumptions regarding the evolution in the exogenous variables. Further, in order to throw the effects of the exogenous policy shocks into relief, we also need to establish some kind of reference scenario, against which the effects of economic policy shifts can be compared. This

Projected evolution in gross domestic product (1987-prices), Mt.bill.

base line projection over twenty years is built on assumptions which largely extrapolate the late development in the different exogenous variables.

The reference scenario for Mozambique is established as follows. First, we assume a constant monetary growth rate 25 per cent. This magnitude is also representative for the monetary growth over the last five years, and may be looked upon as an average over the growth in the broad money supply over recent years. Second, the observed deterioration of the terms of trade is extrapolated, implying a 2.5 per cent annual decrease in the terms of trade index. Finally, we take the interest rate to be constant at 37 per cent, which is reported by IMF (1993) to be the relevant interest rate for 1993. Figure 6.2 presents the annual levels of GDP for the reference scenario, whereas the projected growth rates are illustrated in figure 6.3. Observe that the rate of growth is falling over time also in the reference alternative, reflecting the assumed continuous deterioration of the terms of trade, and the fact that the error-correction mechanism reduces the rate of growth as the GDP level increases. Over

Figure 6.3 GDP growth under the reference scenario

Projected annual growth rates in per cent

the twenty year projected period, the reference scenario implies an average annual growth rate of 4.3 per cent. This allows the gross domestic product of Mozambique to double about every fifteen years.

The next step is to introduce the policy experiments. In general, there are two main groups of alternatives when we are to implement exogenous changes in our model. First, one may shift the exogenous variable in a once-and-for-all manner. This will affect the *level* of the variables involved, whereas the growth rate of the variable will be left unchanged. Second, one may pursue continuous macroeconomic policy plans, implying a gradual change in the different exogenous variables. This will affect the *growth rates* of the exogenous variables, and the levels will be affected indirectly and continuously. Combinations of these two main groups of alternatives are also perfectly possible, leaving us with a large possible number of policy plans to be evaluated. It is beyond this report to be totally exhaustive on this point, and therefore we restrict ourselves to presenting the implications of partial changes in the variables of our estimated model. However, the implications of these exogenous influences will be illustrated both for the discrete and for the continuous case.

6.3 Discrete shocks in policy variables

The preferred estimated model includes broad money, the terms of trade, and the interest rate as exogenous policy variables. This opens for three partial one-shot experiments. First, we hold the supply of money constant between 1993 and 1994, whereas the monetary growth rates are assumed to remain unchanged (at an annual 25%) from 1995 to 2011. This alternative is referred to as "One-shot contraction of broad money" in figure 6.4. The second experiment is to assume a discrete (10%) improvement in the terms of trade index in 1994, whereas the modest deterioration of the reference alternative is assumed to continue from 1995. This alternative is referred to as "One-shot improvement in the terms of trade" in figure 6.4. The third experiment involves the interest rate, and here we assume a discrete increase from 37 to 45 per cent in 1994, and that this level is maintained throughout the period. This alternative is referred to as "One-shot increase in interest rates" in figure 6.4.

As one might have expected, the impact of a contraction of the supply of broad money is a reduction in the gross domestic product, relatively to the reference scenario. The short-term effect implies a 1.2 per cent reduction from the first to the second year, whereas the long term effect of this experiment seems to be a gross domestic product about 3.5 per cent below the projection of the reference scenario. Further, a discrete increase in the terms of trade produces an increase in the level of activity, relatively to the base-line projection. As our model does not include short-term effects of changes in the terms of trade index, the projection does not react until the second year after the change, when the lagged level has responded. Over the period, the effect of a discrete 10 per cent increase in the terms of trade seems to
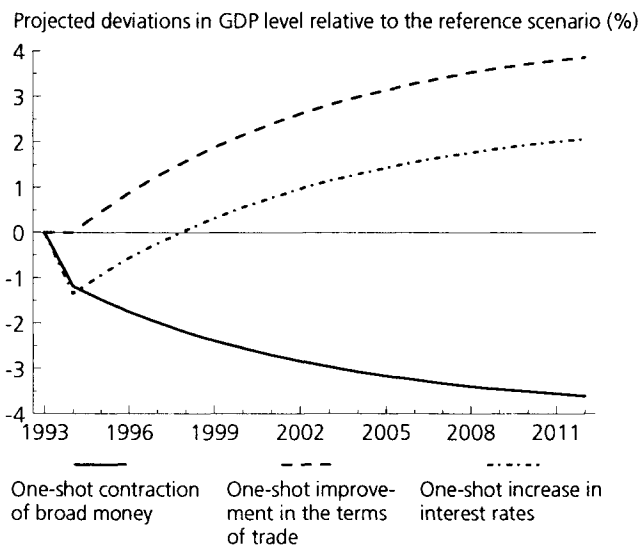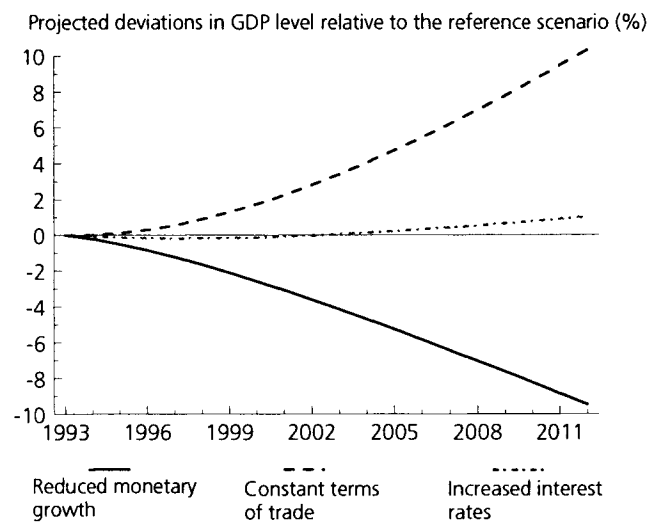
Figure 6.4 Simulated one-shot policy changes

Projected deviations in GDP level relative to the reference scenario (%)

One-shot contraction of broad money   One-shot improvement in the terms of trade   One-shot increase in interest rates

Figure 6.5 Simulated continuous policy experiments

Projected deviations in GDP level relative to the reference scenario (%)

Reduced monetary growth   Constant terms of trade   Increased interest rates

be a gross domestic product about 3 per cent higher than in the reference scenario. This illustrates the long-run positive impact of restructuring the international trade pattern.

The third example illustrates the projected effects of a discrete increase in the interest rate *level* from 1994, from an annual 37 per cent in the reference scenario, to a constant 45 per cent in the present projection. As commented above, this produces a significant contractive effect in the short run, as the GDP growth rate falls from 5.6 to 4.0 per cent from one year to another. However, the long-run structural impact of increasing interest rates seems to be favourable, again increasing annual GDP growth above the reference alternative. After a five-year period, an increase in the interest rate level has advantageous effects relative to the projected reference every year of the period. This illustrates the long-term gains that might occur if the capital markets are restructured to facilitate an efficient flow of domestic savings towards domestic investments. The multinational donors are devoted to these problems through their financial sector reform programmes, commented in chapter 2.

6.4 Continuous policy experiments

The second group of policy alternatives incorporate changes in the growth rates of the different independent variables. We still keep the reference alternative described above unchanged, and the implications of the alternative policy plans are measured as deviations from the reference scenario. The measures will also still be restricted to three partial experiments, each incorporating an isolated change in the growth rate of the three independent variables. In the first experiment we reduce the growth in the money supply from an annual 25 per cent to an annual 20 per cent over the complete period. This alternative is referred to as "reduced monetary growth" in figure 6.5. Second, we keep the terms of trade constant, in stead of extrapolating the deterioration assumed

in the reference alternative. This experiment is referred to as "constant terms of trade" in figure 6.5. Finally, we let the interest rate rise by 0.5 percentage points every year throughout the period. This case is referred to as "interest rate increase" in figure 6.5.

As expected, the reduction in the rate of growth in broad money makes GDP growth slow down. By the end of the period this experiment yields an annual gross domestic product about 9 per cent below the projection of the reference scenario. This deviation will also continue increasing, because the structural effect of this experiment implies an ever-lasting negative deviation in the rate of economic growth, again relative to the reference alternative. Figure 6.5 also illustrates how an improvement in the terms of trade may produce an increase in the rates of growth, implying a continuous increase also in the deviation presented in the figure. As there are no short-term dynamic effects connected to the terms of trade, the estimated structural effect of our model produces a undisputable positive effect on the evolution in the gross domestic product.

However, this is not the case for the last policy experiment, involving a continuous increase in the interest rates. As chapter 5 illustrated, there seem to be adverse short-run effects connected with an increase in the interest rates. That interest rates are negatively correlated with the level of activity in the short run is not surprising, as this is the standard hypothesis of Keynesian macroeconomic theory. On the other hand, our model incorporates a positive long-run structural effect of increasing interest rates, and this is not in accordance with traditional macroeconomics. Figure 6.5 suggests that the impact of an interest rate increase is negative in the short run, but this negative influence is continuously hindered by the positive structural effect. With our choice of policy, the structural effect of interest rate increase seems

39

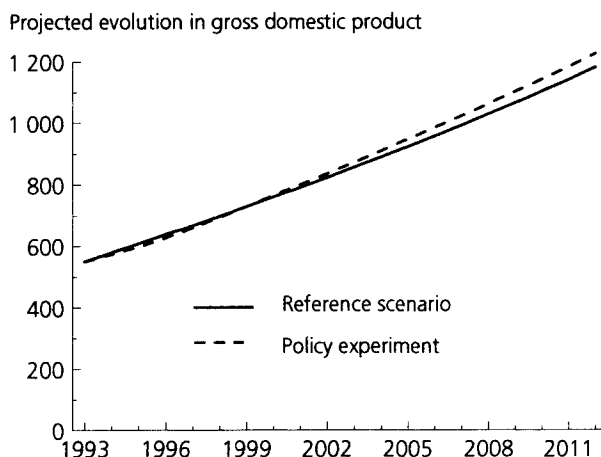to outweigh the negative dynamic effect only after about ten years.

These experimental projections underscores the dilemma of choosing the right macroeconomic policies; The positive effects of gradualism may be modest, and will often occur with many years delay. However, the short term adverse effects of structural adjustment may be reduced to trifles if gradualism is chosen. On the other hand, the one-shot changes of the previous section may have serious short-term adverse effects. Still the structural effects break through at an earlier stage with this kind of policy, making "cold turkey" strategies more efficient, when measured by productive gains alone. Thus, to some extent one may understand those who claim gradualism to be slow and inefficient. But one should also remember that gradualism represents a much more considerate approach to the problems of structural adjustment. The proper answers are therefore far from evident. Social objectives and preferences concerning the distribution of income may thus still make the gradual approach best suited in pursuing the economic and political plans of the government.

6.5 Accommodating monetary control

Our model includes a positive spill-over from nominal magnitudes to real economic development through the transmission mechanism for monetary impulses. This implies that a contraction of the broad money supply has disadvantageous effects on the real level of activity. On the other hand, one should not jump to the conclusion that an expansion of the broad money supply is the appropriate measure to increase the rate of GDP growth. The reason is that our model overlooks the adverse effects of high and increasing rates of inflation. As discussed in chapter 2, inflation may have severe consequences on domestic production, capital movements, and interest rates. Our conclusions may be looked upon as valid only for a given rate of inflation. Targeting the broad money supply to reduce inflationary pressures may thus still have relevance. The final simulated experiment is therefore constructed to illustrate the real effects of reduced monetary growth, and to illuminate what measures that might be taken to counteract these direct negative effects on domestic production. To illustrate the ideas we construct a specially tailored experiment.

First, we let the annual rate of growth in the broad money supply fall from 25 to 20 per cent from 1993 to 1994. From 1995 to 2004 the same annual growth rate is reduced by 0.5 percentage points every year. From 2004 to 2011, the monetary growth rate is held constant at the resulting 15 per cent per annum. In isolation, this measure produces a contraction in the gross domestic product when measured relatively to the reference scenario. If the production level is to be maintained, the control of the money supply will therefore have to be followed by appropriate accommodating measures. To illustrate this, we first let the terms of trade index improve at a rate of 2.5 per cent in 1994, and this rate of improvement is then assumed to fall gradually towards an annual 1 per cent in 2011. Finally, the interest rate is in-

Figure 6.6 A complex policy experiment

Projected evolution in gross domestic product

creased gradually to 50 per cent over the first three years, and is then held constant throughout the period. The implications for the level and growth of GDP are illustrated in figures 6.6 and 6.7, respectively.

From figure 6.6 we observe that the reference scenario yields a higher GDP level than the policy experiment for the first five years after the implementation of policy measures. Also GDP growth rates are higher for the reference alternative, but only for the first two years. These results are due to the short-term adverse effects of the increase in interest rates, which are at work together with the reduced monetary growth. However, the growth rates of our policy experiment picks up by 1996, and when measured in terms of economic growth, the alternative dominates the reference scenario from then and throughout the period. For the level of activity, this simulated policy experiment im-

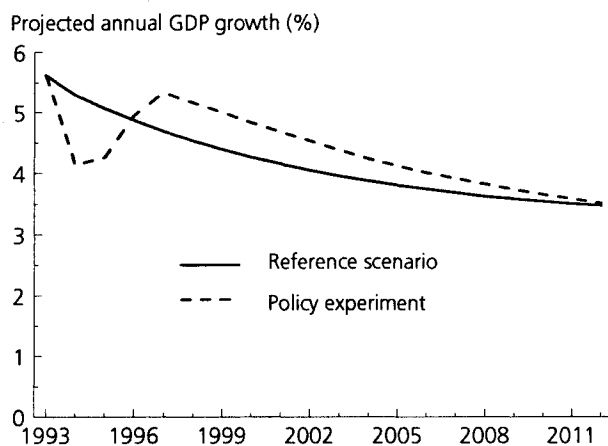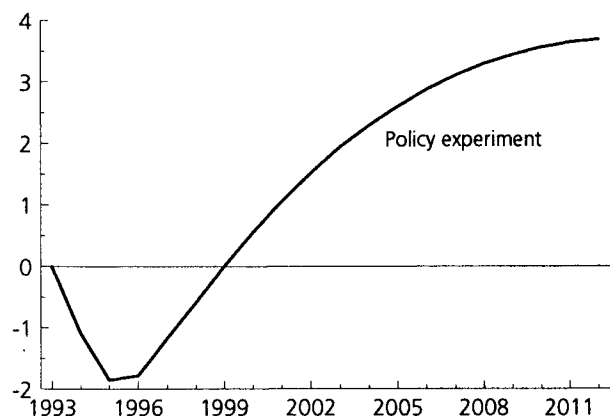Figure 6.7 Economic growth under the complex policy experiment

Projected annual GDP growth (%)

Figure 6.8 Benefits of the complex policy experiment

Projected deviation in GDP level relative to the reference scenario (%)

---

plies a higher gross domestic product than the reference alternative for every year after 1999.

Figure 6.8 illustrates the projected benefits of our complex policy experiment. Compared to real world experience, the applied policy measures are not especially dramatic. Nonetheless, it takes 3 years to improve on the growth rates, and 6 years to improve on the GDP levels of the reference alternative. This illuminates the sluggishness of the estimated model, a feature which is likely to characterize also the actual functioning of the macroeconomy in developing countries. If the macroeconomy respond largely to *lagged* changes and levels of different macroeconomic indicators, instead of their *current* values, the economy will typically be sluggish in its response to external shocks and policy changes. The error-correction formulation of our single-equation econometric model is one example of such mechanisms. This should also remind us of the pittance which is required in evaluating implemented macroeconomic stabilization plans for countries such as Mozambique.

The presented simulations should not under any circumstance be taken as literal projections of the evolution of the Mozambican economy. Rather, they should be considered as illustrative examples of macroeconomic mechanisms which may be of relevance for the design of economic policy. It has not escaped our attention that there are numerous factors which affect the growth of an economy, and that our estimated equation only captures a minimal fraction of these. Nonetheless, it is hoped that the above exposition will stimulate stringent and empirically oriented thoughts on how to design the macroeconomic reforms for developing countries.

7. Conclusions

The design of appropriate macroeconomic structural adjustment policies for developing countries remains a complex and highly debated issue. Many reasons may contribute to the explanation of the background for this debate. First, the multinational donor community offers integrated structural adjustment programmes which can be criticized for being stereotype, and inconsiderate with respect to country-specific variations in political, economic and social conditions. This is especially relevant for Mozambique, as this country is extremely poor and debt-ridden, also by World Bank standards. In addition, a relatively standard structural adjustment programme was implemented in the domestically unstable situation which accompanied the civil war of the 1980's. The macroeconomy of Mozambique has thus literally been worlds apart from the model economies of the multinational donor community. One can not expect an economy like this to respond to external shocks in the same way as other developing countries, not to mention the economies of the industrialized world.

Second, the structural adjustment programmes often take a long-term view of the macroeconomy, trying to improve the general structure over a number of years. In addition, many of the recommended changes in policy have short-term adverse effects, and these tend to harm a population already struggling with extreme poverty. For countries like Mozambique this may be provoking, considering the urgency of this country's economic and social needs. As stressed by the ANC in their thoughts on macroeconomic plans for post-apartheid South-Africa, it might be time to introduce a more significant social profile to the restructuring efforts in Africa (cf. Tjønneland [1990]). Looking back on the 1980's, the "trickle-down" effects from a general increase in economic growth has not been convincing. To ensure the viability of economic reforms the long-term restructuring should therefore be accommodated by appropriate short-term measures, to secure a minimum consumption level for all the population, but in particular the poor. This also resembles the recent recognition from the designers of reform policies for Russia.

Third, the effects of many of the policy measures that have been applied in the adjustment programmes are hampered by the sluggishness of the macroeconomic mechanisms in developing countries. The simple simulations of chapter 6 have illustrated how sluggish the macroeconomy may re-

spond to exogenous shocks and policy changes if economic agents respond to *lagged* macroeconomic indicators instead of their updated *current* values. In evaluating the results of structural adjustment this should be taken into consideration. As stressed by policy designers, and by the analysis above, it may take many years to reach the final turnaround in a destabilized and underdeveloped economy like e.g. Mozambique.

Thus, future policy plans should be increasingly tailored, taking proper account of the country-specific properties of the economy, in addition to general features and characteristics of the macroeconomy in developing countries. Further, the feasibility of structural adjustment should be increasingly secured through proper short-term measures, to soften the short-term adverse effects of structural adjustment, and to guarantee a minimum consumption level for transfer-deserving households. Finally, the implementation of restructuring should be accompanied by general information, reflecting the government's commitment to the macroeconomic policy. This might improve the understanding of the needs for structural adjustment, and reduce the general impatience in a population expecting real improvements in their standards of living.

In many cases, the success of structural adjustment hinges critically on the policy-designers' ability to smooth the transition to a sustainable path of development. This requires an overview of the consequences of alternative policy plans, and optimal decision-making will therefore depend critically on advisory support on as many as possible of the problems of concern. One useful device for this type of economic and political planning is a mathematical imitation of economic mechanisms, or more precise, an empirically-based model of the macroeconomy. This will make it possible to estimate the quantitative effects of different policy measures and other external shocks to the economy, and could thus be an important piece of support to the designers of economic policy. Although a macroeconomic model will not provide the precise answers to all problems involved by structural adjustment, this kind of integrated framework can contribute to a better understanding of the underlying macroeconomic mechanisms of a developing economy, and thereby improve the efficiency of the economic and political strategies.

8. Literature

Barro, R. J. and Lee, J. (1993), "International comparisons of educational attainment", *Journal of Monetary Economics*, vol. 32, no. 3, pp. 363–394.

Bowen, M. (1992), "Beyond Reform: Adjustment and Political Power in Contemporary Mozambique", *Journal of Modern African Studies*, vol. 30, no. 2, pp. 225–279.

Bruno, M. (1979), "Stabilization and Inflation in a semi–industrialized economy", in: Dornbusch, Rudiger and Frenkel, Jacob A. (eds.), *International economic policy, theory and evidence*, Johns Hopkins University Press, Baltimore, pp. 270–289.

Brochmann, G. and Ofstad, A. (1990), "Mozambique: Norwegian assistance in a context of crisis", *Report R 1990: 4*, Christian Michelsens Institutt (CMI), Bergen.

Cappelen, Å. (1992), "Økonomisk utvikling i Mosambik etter ERP", (Economic Development in Mozambique under the ERP), unpublished mimeo in Norwegian, Statistics Norway.

Cappelen, Å., Mohn, K., Rolland, M. and Aasness, J. (1993), "Comments to: Adjustment in Sub-Saharan Africa: Progress, Payoffs, and Challenges", unpublished mimeo in Norwegian, Statistics Norway.

Cassen R. et al. (1986), *Does aid work?*, Clarendon Press.

Collier, P. and Gunning, J. W. (1991), "Money Creation and Financial Liberalization in a Socialist Banking System, Tanzania 1983–88", *World Development*, vol.19, no. 5, pp. 533–538.

Conway, P. (1994), "An Atheoretic Evaluation of Success in Structural Adjustment", *Economic Development and Cultural Change*, vol. 42, no. 2, pp. 267–292.

Cornia, G., Jolly, R. and Stewart, F. (1987), *Adjustment with a Human Face*, Oxford University Press, Oxford.

De Long, B. and Summers, L. H. (1993), "How strongly do developing economies benefit from equipment investments?", *Journal of Monetary Economics*, vol. 32, no. 3, pp. 395–416.

Easterly, W. and Rebelo, S. (1993), "Fiscal Policy and Economic Growth: An Empirical Investigation", *Journal of Monetary Economics*, vol. 32, no. 3, pp. 417–458.

Easterly, W., Kremer, M., Pritchett, L., and Summers L. H. (1993), "Good Policy or Good Luck? Country Growth performance and Temporary Shocks", *Journal of Monetary Economics*, vol. 32, no. 3, pp. 459–484.

Edwards, S. (1994), "The Political Economy of Inflation and Stabilization in Developing Countries", *Economic Development and Cultural Change*, vol. 42, no. 2, pp. 235–266.

Engle, R. F. and Granger, C. W. J. (1987), "Cointegration and Error-Correction - Estimation and Testing", *Econometrica*, vol. 55, pp. 251–276.

Faini, R., de Melo, J., Senhadji, A. and Stanton, J. (1991), "Growth-Oriented Adjustment Programs: A Statistical Analysis", *World Development*, vol. 19, no.8, pp.957–967

Fischer, S. (1992), "Growth, Macroeconomics , and Development", in: Fischer, S. and Blanchard, O. (eds.), *Macroeconomics Annual 1992*, pp. 329–379, National Bureau of Economic Research.

Fischer, S. (1993), "The Role of Macroeconomic Factors in Growth", *Journal of Monetary Economics*, vol. 32, no. 3, pp. 485–512.

Fry, M. (1988), *Money, Interest, and Banking in Economic Development*, Johns Hopkins University Press, Baltimore and London.

Gurley, J. G. and Shaw, E. S. (1955), "Financial Aspects of Economic Development", *American Economic Review*, no. 45, september, pp. 515–538.

Gurley, J. G. and Shaw, E. S. (1960), *Money in a Theory of Finance*, The Brookings Institution, Washington D.C.

Hermele, K. (1990), "Mozambican Crossroads – Economics and Politics in the Era of Structural Adjustment", *Report R 1990: 3*, Christian Michelsen Institute, Bergen.

International Monetary Fund (1991), *International Financial Statistics*, Yearbook 1991.

International Monetary Fund (1992), "Mozambique – Policy Framework Paper 1992–1994".

International Monetary Fund (1993a), "Mozambique – Policy Framework Paper 1994–1996".

International Monetary Fund (1993b), *International Financial Statistics*, Yearbook 1993.

Jarque, C. M. and Bera, A. K. (1980), "Efficient Tests for Normality, Homoskedasticity and Serial Independence of Regression Residuals", *Economic Letters*, vol. 6, pp. 255–259.

King, R. G. and Levine, R. (1993a), "Finance and Growth: Schumpeter might be right", *Quarterly Journal of Economics*, vol. 108, no. 2, may, pp. 717–737.

King, R. G. and Levine, R. (1993b), "Finance, Entrepeneurship, and Growth: Theory and Evidence, *Journal of Monetary Economics*, vol. 32, no. 3, pp. 513–542.

Krugman, Paul og Taylor, Lance, (1978) , "Contractionary Effects of Devaluation", *Journal of International Economics*, vol.8, pp. 445–456.

Kyle, S. (1991), "Economic Reform and Armed Conflict in Mozambique", *World Development*, vol. 19, no. 6, pp. 637–649.

Lucas, R. E. (1988), "On the Mechanics of Economic Development", *Journal of Monetary Economics*, vol. 22, pp. 3-42.

Lucas, R. E. (1993), "Making a Miracle", *Econometrica*, vol. 61, no. 2, pp. 251-272.

McKinnon, R. I. (1973), *Money and Capital in economic development*, The Brookings Institution, Washington D.C.

Mohn, K. (1992), "Finanssektor og økonomisk utvikling" (Financial sector and economic development), *Report 28/92* (in Norwegian), Center for Research in Economics and Business Administration (SNF), Bergen.

Montiel, Peter J. (1991), "The Transmission Mechanism for Monetary Policy in Developing Countries", *IMF Staff Papers*, vol.38, no.1, March, pp. 83–108.

Morley, S. A. (1992), "On the Effect of Devaluation during Stabilization Programs in LDC's", *Review of Economics and Statistics*, vol. no. pp. 21–28.

Pedersen, K. R. (1991), "U-hjelp – Nytter det ?", (Development aid – does it work ?), *Working paper* (in Norwegian), Center for Research in Economics and Business Administration (SNF), Bergen.

Romer, P. M. (1986) , "Increasing Returns and Long Run Growth", *Journal of Political Economy*, vol. 94, no.5, pp. 1002–1037.

Romer, P. M. (1993), "Idea Gaps and Object Gaps in Economic Development", *Journal of Monetary Economics*, vol. 32, no. 3, pp. 543–574.

Shaw, E. (1973), *Financial Deepening and Economic Development*, Oxford University Press, Oxford.

Sims, C. A. (1980), "Macroeconomics and Reality", *Econometrica*, vol. 48, no. 1, January, pp. 1–48.

Summers, L. H. and Pritchett, L. H. (1993), "The Structural Adjustment Debate", *American Economic Review, Papers and Proceedings*, vol. 83, no. 2, may, pp. 383–389.

Taylor, L. (1980), "IS/LM in the Tropics, Diagrammatics of the New Structuralist Macro Critique", in Weintraub, Sidney and Cline, William R. (eds.), *Economic Stabilization in Developing Countries*, Brookings Institution, Washington D.C.

Tjønneland, E. N. (1990), *Southern Africa after Apartheid*, Christian Michelsen Institute, Bergen.

van Wijnbergen, S. (1984),"The Dutch Disease – A Disease After All ?", *Economic Journal*, vol. 94, no. 373, march, pp. 41–55.

Voridis, H. (1993), "Ceilings on Interest Rates and Investment: The Example of Greece", *Review of Economics and Statistics*, vol. 75, no. 2, may, pp. 276–283.

World Bank (1989), "Adjustment Lending: An Evaluation of Ten Years of Experience", *Policy and Research Series*, no. 1, Washington D.C.

World Bank (1990), "Adjustment Lending Policies for Sustainable Growth", *Policy and Research Series*, no. 14, Washington D.C.

World Bank (1992a), "Adjustment Lending and Mobilization of Private and Public Resources", *Policy and Research Series*, no. 22, Washington D.C.

World Bank (1992b), "Mozambique – Financial Sector Study", *report no. 10269–MOZ*, Southern Africa Department, Washington D.C.

World Bank (1993), "Adjustment in Sub-Saharan Africa: Progress, Payoffs, and Challenges", *Policy Research Report*, no. 2, Washington D.C.

Utkommet i serien Rapporter fra Statistisk sentralbyrå
etter 1. januar 1993 (RAPP)
Issued in the series Reports from Statistics Norway
since 1 January 1993 (REP)

Nr. 92/26 Nils Øyvind Mæhle: Kryssløpsdata og
kryssløpsanalyse 1970-1990.
1993-230s. 140 kr
ISBN 82-537-3783-1

- 92/29 Charlotte Koren og Tom Kornstad:
Typehusholdsmodellen ODIN.
1993-34s. 75 kr ISBN 82-537-3797-1

- 93/1 Naturressurser og miljø 1992.
1993-144s. 115 kr
ISBN 82-537-3844-7

- 93/1A Natural Resources and the Environment
1992. 1993-154s. 115 kr
ISBN 82-537-3855-2

- 93/2 Anne Brendemoen: Faktoretterspørsel i
transportproduserende sektorer.
1993-49s. 75 kr ISBN-82-537-3814-5

- 93/3 Jon Holmøy: Pleie- og omsorgs- tjenesten i
kommunene 1989.
1993-136s. 100 kr
ISBN 82-537-3811-0

- 93/4 Magnar Lillegård: Folke- og boligtelling
1990 Dokumentasjon av de statistiske
metodene. 1993-48s.
90 kr ISBN 82-537-3818-8

- 93/5 Audun Langørgen: En økonometrisk
analyse av lønnsdannelsen i Norge.
1993-48s. 100 kr ISBN 82-537-3819-6

- 93/6 Leif Andreassen, Truls Andreassen, Dennis
Fredriksen, Gina Spurkland og Yngve
Vogt: Framskriving av arbeidsstyrke og
utdanning Mikrosimuleringsmodellen
MOSART. 1993-100s. 100 kr
ISBN 82-537-3821-8

- 93/7 Dennis Fredriksen og Gina Spurkland:
Framskriving av alders- og uføretrygd
ved hjelp av mikrosimulerings-
modellen MOSART. 1993-58s. 90 kr
ISBN 82-537-3945-1

- 93/8 Odd Frank Vaage: Feriereiser 1991/92.
1993-44s. 75 kr
ISBN 82-537-3831-5

- 93/9 Erling Holmøy, Bodil M. Larsen og
Haakon Vennemo: Historiske
brukerpriser på realkapital.
1993-63s. 90 kr ISBN 82-537-3832-3

Nr. 93/10 Runa Nesbakken og Steinar Strøm:
Energiforbruk til oppvarmingsformål i
husholdningene. 1993-41s. 75 kr
ISBN 82-537-3836-6

- 93/11 Bodil M. Larsen: Vekst og produktivitet i
Norge 1971-1990.
1993-44s. 75 kr ISBN 82-537-3837-4

- 93/12 Resultatkontroll jordbruk 1992. Tiltak mot
avrenning av næringssalter og jorderosjon
1993-79s. 90 kr
ISBN 82-537-3835-8

- 93/13 Odd Frank Vaage: Mediebruk 1992.
1993-38s. 75 kr ISBN 82-537-3854-4

- 93/14 Kyrre Aamdal: Kommunal ressursbruk og
tjenesteyting Makromodellen MAKKO.
1993-94s. 100 kr
ISBN 82-537-3857-9

- 93/15 Olav Bjerkholt, Torgeir Johnsen og Knut
Thonstad: Muligheter for en bærekraftig
utvikling Analyser på World Model. 1993-
64s. 90 kr
ISBN 82-537-3861-7

- 93/16 Tom Langer Andersen, Ole Tom Djupskås
og Tor Arnt Johnsen: Kraftkontrakter til
alminnelig forsyning i 1992 Priser,
kvantum og leveringsbetingelser. 1993-42s.
75 kr
ISBN 82-537-3864-1

- 93/17 Steinar Strøm, Tom Wennemo og Rolf
Aaberge: Inntektsulikhet i Norge 1973-
1990. 1993-99s. 100 kr
ISBN 82-537-3867-6

- 93/18 Kjersti Gro Lindquist: Empirical Modelling
of Exports of Manufactures: Norway 1962-
1987. 1993-124s. 100 kr
ISBN 82-537-3869-2

- 93/19 Knut Røed: Den selvforsterkende
arbeidsledigheten Om hystereseeffekter i
arbeidsmarkedet. 1993-95s. 90 kr
ISBN 82-537-3870-6

- 93/20 Dag Kolsrud: Stochastic Simulation of
KVARTS91. 1993-70s. 95 kr
ISBN 82-537-3952-4

- 93/21 Sarita Bartlett: The Evolution of
Norwegian Energy Use from 1950 to
1991. 1993-142s. 100 kr
ISBN 82-537-3890-0

Nr. 93/22 Klaus Mohn: Industrisysselsetting og
produksjonsteknologi i norske regioner.
1993-59s. 90 kr
ISBN 82-537-3910-9

- 93/23 Torbjørn Eika: Norsk økonomi
1988-1991: - Hvorfor steg arbeids-
ledigheten så mye? 1993-38s. 75 kr
ISBN 82-537-3912-5

Nr. 93/24   Kristin Rypdal: Anthropogenic Emissions
            of the Greenhouse Gases CO_2, CH_4 and
            N_2O in Norway
            A Documentation of Methods of
            Estimation, Activity Data and
            Emission Factors. 1993-65s. 90 kr
            ISBN 82-537-3917-6

-   93/25   Skatter og overføringer til private Historisk
            oversikt over satser mv. Årene 1975-1993.
            1993-75s. 90 kr
            ISBN 82-537-3922-2

-   93/26   Thor Olav Thoresen: Fordelings-
            virkninger av overføringene til
            barnefamilier Beregninger ved
            skattemodellen LOTTE. 1993-42s.
            75 kr ISBN 82-537-3923-0

-   93/27   Odd Frank Vaage: Holdninger til norsk
            utviklingshjelp 1993.
            1993-41s.75 kr ISBN 82-537-3931-1

-   93/28   Kjetil Sørlie: Bofasthet, flytting og
            utdanningsnivå i kommunene Åtte årskull
            fulgt gjennom aldersfasen
            15-35 år Del 1: Østlandet. 1993-174s. 115
            kr ISBN 82-537-3935-4

-   93/29   Kjetil Sørlie: Bofasthet, flytting og
            utdanningsnivå i kommunene Åtte årskull
            fulgt gjennom aldersfasen
            15-35 år Del 2: Sørlandet og
            Vestlandet. 1993-179s. 115 kr
            ISBN 82-537-3936-2

-   93/30   Kjetil Sørlie: Bofasthet, flytting og
            utdanningsnivå i kommunene Åtte årskull
            fulgt gjennom aldersfasen
            15-35 år Del 3: Trøndelag og Nord-Norge.
            1993-165s. 115 kr
            ISBN 82-537-3937-0

Nr. 93/31   Erling Holmøy, Torbjørn Hægeland,
            Øystein Olsen og Birger Strøm: Effektive
            satser for næringsstøtte. 1993-178s. 115 kr
            ISBN 82-537-3947-8

-   94/1   Torstein Bye, Ådne Cappelen, Torbjørn
            Eika, Eystein Gjelsvik og Øystein Olsen:
            Noen konsekvenser av
            petroleumsvirksomheten for norsk økonomi.
            1994-54s. 95 kr
            ISBN 82-537-3956-7

-   94/2   Wenche Drzwi, Lisbeth Lerskau, Øystein
            Olsen og Nils Martin Stølen: Tilbud og
            etterspørsel etter ulike typer arbeidskraft.
            1994-56s. 95 kr
            ISBN 82-537-3950-8

-   94/3   Hilde-Marie Branæs Zakariassen:
            Tilbud av arbeidskraft i Norge En empirisk
            analyse på kvartalsdata for perioden 1972 til
            1990. Under utgivelse

-   94/4   Resultatkontroll jordbruk 1993 Tiltak mot
            avrenning av næringssalter og jorderosjon.
            Under utgivelse

-   94/5   Haakon Vennemo: A Growth Model of
            Norway with a Two-way Link to the
            Environment. 1994-57s. 95 kr
            ISBN 82-537-3985-0

-   94/6   Odd Frank Vaage: Feriereiser 1992/93.
            1994-49s. 80 kr ISBN 82-537-3983-3

-   94/7   Magnar Lillegård: Prisindekser for
            boligmarkedet. Under utgivelse-

-   94/8   Grete Dahl, Else Flittig og Jorunn Lajord:
            Inntekt, levekår og sysselsetting for
            pensjonister og stønadsmottakere i
            folketrygden.
            Under utgivelse

Statistisk sentralbyrå

94/11

Structural Adjustment in Mozambique

Statistisk sentralbyrå
Statistics Norway

Foto: Huntgjuran Akkutryklu, Oslo

9 788253 740058