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This report has been prepared by Hans Falck.

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Dutch Disease in Mozambique?

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Contents

Summary

This study addresses the question of whether foreign aid to Mozambique has given rise to Dutch Disease, i.e. whether aid through its effects on the real exchange rate has deteriorated the competitiveness of the country. According to the Dutch Disease theory, a capital inflow such as foreign aid may give rise to an appreciation of the real exchange rate and a resource reallocation in the aid-recipient country. An appreciation of the real exchange rate decreases competitiveness of sectors exposed to international competition. As a result, production in these sectors tends to decrease, which negatively affects the potential of the country to earn foreign exchange. This development counteracts one of the most important objectives of foreign aid: i.e., to contribute to increased economic growth and thereby to a decrease in the dependency on aid.

Foreign aid inflow increased sharply during the second half of the 1980s and reached a peak in 1992 of more than US$1.4 billion. Thereafter the aid inflow decreased and in 1997 it amounted to approximately US$1 billion. The importance of foreign aid for the Mozambican economy is illustrated by the fact that foreign aid in 1996 constituted 60 per cent of GNP, second only to Guinea-Bissau (World Bank 1999).

Our empirical analysis gives a mixed result with respect to the effects of foreign aid. The development of several macroeconomic variables, such as exchange rates and exports, to some extent corresponds with what can be expected from this theory. Even so, our analysis does not provide much evidence that changes in the aid inflow are reflected in changes in the macroeconomic variables in the way suggested by the Dutch Disease theory.

When it comes to relative sector development, our analysis does not show any impact of aid as predicted by the Dutch Disease theory. However, aid can be regarded as strengthening the position of Maputo as the economic and political centre of Mozambique. This is matter of concern since it adds to the existing development gap between Maputo and the rural areas.

Even though the exchange rates do not reflect all fluctuations in the aid inflow, it should be beyond doubt that the aid inflow, which is more than twice the size of the income from exports of goods, has resulted in the fact that Mozambique today has a more appreciated real exchange rate than it would have without foreign aid. Foreign aid has also contributed to the stability of the exchange rate. First, it creates a demand for the Metical. Second, through conditionality and by providing financial support, aid makes it possible for the government and the Bank of Mozambique to hold on to a tight economic policy. Third, continued aid serves as a signal to private investors that the Mozambican economy is on the right track.

The impact of aid on prices and exchange rates seems to have passed through only to a limited extent to the real variables of the economy. A probable reason is that the supply elasticity of changes in structural factors is larger than the supply elasticity of changes in price and exchange rates in determing output and export performance. Thus, the low development levels of human capital, infrastructure and communication constitute more important impediments to growth than the Dutch Disease effects.

To the extent that foreign aid contributes to the removal of the many structural bottlenecks in the Mozambican economy, the positive effects of aid on growth can be expected to outweigh its negative effects. In addition, by contributing to the removal of bottlenecks aid also contributes to a downward pressure on prices, which counteracts the inflationary Dutch Disease effects.

It is not certain that a situation without aid would imply an increase in competitiveness. Even though the appreciative pressure on the exchange rate would decrease, this gain in competitiveness would probably be erased by increased imported inflation. In addition, without aid the obvious risk is that the government would finance its expenditure through inflationary means. The expected increase in inflation in combination with the disappearance of donors as 'lenders of last resort' would negatively affect private investments.

There are strong arguments for keeping aid to Mozambique untied: tied aid implies that government ownership decreases in pace with the increasing influence of donors, domestic financing of the current costs of tied aid implies a threat to the government's own preferred projects and budget targets, and the administration costs for both donors and recipient increase with more tied aid. [1]

The large debt relief implied by the HIPC initiative will probably have a positive effect on private capital flows since it significantly improves Mozambique's overall debt situation. The possible appreciative effects on the exchange rate of the mega projects should be more than counteracted by the productivity increasing effects of the investments, in particular since it is quite likely that most of them are directed to the export sector.

The limited Dutch Disease effects of aid to Mozambique imply that there is no reason to increase the tiedness of aid. The smaller Dutch Disease effects that more tied aid imply would not compensate for the negative effects in the form of lost ownership and strain on the government budget. A better way for donors to secure influence over the use of aid is to attach conditionality. In setting conditional targets it is important to balance the donors' demand for insight against the recipient's requirement of ownership.

Even though the Dutch Disease effects of aid are limited in Mozambique at present, there is no guarantee that they will continue to be so. It is probable that the effects of aid on prices and exchange rate will be more important for economic performance in pace with the removal of structural bottlenecks. In order to avoid unwanted effects on competitiveness it is important to create and develop instruments for exchange rate management. One such method for forestalling Dutch Disease effects is to allow Mozambique to place aid temporarily in international reserves. The use of aid for international reserves also allows the country to accommodate changes in trade and capital flows and to cushion the impacts of economic shocks.

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[1] Here 'tied aid' refers to aid tied to a particular use and not, as is usual, aid tied to the purchase of products from the donor country.

Introduction

As one of the poorest countries in the world Mozambique receives large amounts of foreign aid.[2] The importance of foreign aid for the Mozambican economy is illustrated by the fact that foreign aid in 1996 constituted 60 per cent of GNP, second only to Guinea-Bissau (World Bank 1999). Foreign aid is of great importance for the import capacity and government budget expenditures. In 1997 unrequited official transfers represented 41 per cent of the imports of goods while grants and borrowing constituted almost two thirds of total government expenditures (IMF 1999). This study addresses the question of whether foreign aid to Mozambique has given rise to Dutch Disease, i.e. whether aid through its effects on the real exchange rate has deteriorated the competitiveness of the country.

The impact on the recipient economy of foreign aid extends beyond the effect intended. In an economic system everything hangs together, and an aid flow directed to one sector also affects the rest of the economy by giving rise to changes in the incentive structure that affect prices and resource allocation in the entire economy. Impact of aid inflows, not limited to the sector to which it is granted, may explain why many developing countries have not succeeded in getting their economies on the path to rapid growth in spite of having received sizeable foreign aid inflows for long periods of time. Furthermore, in many cases, successful individual aid projects have not been reflected in an overall positive macroeconomic performance, a phenomenon known in aid literature as the macro-micro paradox.

The side effects of aid depend on the size and economic structure of the recipient country. For many developing countries the aid inflow constitutes a significant part of the economy, which implies that the effects of aid on the surrounding economy can be substantial. The smaller the recipient economy and the larger the aid inflow the more sensitive is the economy to the aid inflow.

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[2] If GNP per capita is used as mean of measure, the Mozambican GNP per capita of US$90 implies that Mozambique is the poorest country (World Bank 1999).

The form of aid matters also for the impact of aid. Project aid is the traditional form of foreign assistance. During the last fifteen years the composition of aid has changed towards less tied forms, e.g. different forms of programme assistance. Since aid comes in many forms and are directed to different sectors we can expect that its effects on the recipient economy differ.

This study is organised in three major parts. The first part shows how foreign aid through appreciating the real exchange rate gives rise to Dutch Disease. This part analyses also the fungibility approach to Dutch Disease and the Dutch Disease effects of different forms of aid. The second part presents the development of foreign aid and the most important macroeconomic variables in Mozambique during the 1990s. Finally, in the third part, we analyse whether there is any reason to believe that Dutch Disease is a problem in Mozambique.

Foreign aid and Dutch Disease

In this study we will take the Dutch Disease approach as a point of departure for our analysis of the effects of aid. According to the Dutch Disease theory, a capital inflow such as foreign aid may give rise to an appreciation of the real exchange rate and a resource reallocation in the aid-recipient country. An appreciation of the real exchange rate decreases the competitiveness of the sectors exposed to international competition. As a result, production in these sectors tends to decrease, which negatively affects the potential of the country to earn foreign exchange. This development counteracts one of the most important objectives of foreign aid: i.e., to contribute to increased economic growth and thereby to a decrease in the dependency on aid.

In its original form the Dutch Disease theory aimed at explaining the effects on the Dutch economy of the discoveries of the North Sea gas fields in the 1960s. The gas benefited the Netherlands in the form of large export revenues. The subsequent increase in the demand for the Dutch florin gave rise to a real appreciation of the Dutch currency, which made it more difficult for non-oil tradables to compete in international markets. Since then the theory has been used to explain the effects of different types of external shocks. The form of external shock most often analysed is probably the one that originates in oil-price shocks (e.g. Steigum

1992, Webster 1993). The Dutch Disease theory has also been used to study booms in other primary product sectors, such as copper in Zambia (Kayizzi-Mugerwa 1988), coffee in Kenya (Bevan *et al.* 1992), and primary commodities in Malaysia (Claassen 1992).

The Dutch Disease theory has also been applied to the case of foreign aid. The effects of foreign aid are comparable to the effects resulting from the discovery of natural resources. In both situations the availability of foreign currency increases and the domestic currency appreciates. Studies of Dutch Disease effects on the real exchange rate of aid inflow have been made for Papua New Guinea (Weissman 1990), for Sri Lanka (White and Wignaraja 1992), for Ghana (Younger 1992), for Kenya (Olofsgård and Olausson 1993), for Guinea Bissau (Svedberg *et al.* 1994), and for Tanzania (Falck 1997).

As with other potential negative effects of aid it is important to point out that even though aid gives rise to Dutch Disease it does not necessarily imply that the overall effect of aid is bad. Dutch Disease is only one effect of aid and should consequently be weighed against the positive effects of aid. If aid should be granted or not depends on whether the net effect is positive or negative.

Foreign aid and the real exchange rate[3]

The real exchange rate is an essential variable for the Dutch Disease theory. It is through this variable that foreign aid affects the international competitiveness and the sectors of the recipient country. One of the most frequently used definitions of the real exchange rate is the purchasing power parity definition. The absolute version of purchasing power parity states that the real exchange rate equals the ratio of foreign prices, expressed in the currency of the home country over the prices of the home country.

$$RER = NER * P_F / P_D$$

where RER is the real exchange rate, NER is the nominal exchange rate, P_D and P_F are price indexes in the home and foreign countries respectively.

[3] For a more technical presentation of the Dutch Disease theory see e.g. Falck 1997

From the definition it follows that changes in the real exchange rate are functions of underlying changes both in the nominal exchange rate and in the prices of goods and services (domestic and foreign). An analysis of the effects of foreign aid on the real exchange rate and thereby also on the competitiveness of the aid-recipient country thus requires the study of the impact of aid on these variables (for a definition of the real exchange rate see Appendix 2).

Let us start by looking at the effects of aid on the nominal exchange rate. In the case of a free-floating exchange rate the market for foreign currency clears when supply equals demand.

Foreign aid increases the availability of foreign currency in the recipient country. As a result, the market clears at a higher price of domestic currency than in the case when there is no foreign aid, *ceteris paribus*, i.e. foreign aid appreciates the nominal exchange rate. Aid can affect the nominal exchange rate also in another way: when the balance-of-payment clears, even though this is due to the inflow of aid, the government does not feel the urge to correct the exchange rate. Thus, foreign aid makes it possible for the government to hang on to an overvalued exchange rate.

The result of foreign aid may be that the connection between the exchange rate and the international competitiveness of the country is weakened (Edwards 1989). Foreign aid, like all capital flows, affects the level of the exchange rate. The more foreign aid a country receives, the larger this impact will be, *ceteris paribus*. The result for a developing country receiving an amount of foreign aid that is large relative to its foreign trade may be that the exchange rate is determined more by the foreign aid flows than by exports and imports. Thus, the level of the exchange rate is not by itself a good indicator of the international competitiveness of the country.

In the case of a fixed exchange rate the effects of foreign aid are entirely accommodated through changes in prices. According to the core Dutch Disease model (e.g. Corden and Neary 1982) an aid inflow gives rise to two different effects, the resource-movement effect and the spending effect, both of which contribute to an appreciation of the real exchange rate.

The spending effect is a function of the increase in disposable income following the foreign aid inflow. Assuming positive income elasticity, the change in income will give rise to increased spending and subsequently to increased demand in the economy. As the supply of goods are limited by the resources of the country, there will be an excess demand that pushes the prices of domestic products upward in comparison with foreign prices and thereby appreciates the real exchange rate.

The resource-movement effect gives rise to inflation by creating an excess demand for scarce resources, and affects the economy through raising the marginal productivity of the production factors in the sector favoured by aid. Factor compensation increases with the result that production factors move into this booming sector and out of other sectors of the economy. Thus, due to the aid inflow, the lagging sectors lose production resources and productivity decreases. The lower productivity implies higher production cost, lower domestic supply and, as a rule, also higher prices.

For example, an aid project involving construction most likely increases the wages of the construction workers in this sector, which in turn will attract labour from other sectors of the economy. Furthermore, aid in itself may become an industry through which a number of persons earn their living. Noteworthy is that it is not only the actual aid projects that provide potential local employment opportunities. The running of donor organisations also creates demand for local employees such as drivers, cleaners, secretaries, etc. By generating a demand for employees, the activities of the donor organisations result in wages that increase at a higher rate than in the rest of the economy. Aid thus give rise to a pull effect, which encourage people to seek their fortune in the major cities from which the donors mainly operate. Thus, foreign aid risks contributing to imbalances in growth and increased differences between the modern and traditional sectors.

Dutch Disease and fungibility

Dutch Disease gives rise to fungibility, a condition that we will use in our analysis of effects of foreign aid to Mozambique. Fungibility occurs when aid substitutes for domestic spending and thereby frees resources that can be used for other purposes. Foreign aid is said to be fungible when it is spent on goods and services that the recipient would have bought anyway.

Fungibility implies that aid substitutes rather than complements local spending, which traditionally has been seen as the purpose of aid. The view that foreign aid should complement local resources can be traced back to the Harrod-Domar growth model (1939, 1946) and the two-gap model by Chenery and Strout (1966). The latter model is based on the assumptions of the presence of saving and foreign-exchange gaps that the developing countries cannot fill through their own exporting or saving efforts. Furthermore, the low financial credibility of these countries implies that the international capital markets are closed. Instead, according to the two-gap model, foreign aid is required to fill these gaps. Thus, foreign aid makes it possible for the developing country to have levels of imports and investments that are larger than exports and domestic savings can provide.

If aid intended for imports fulfils its role as a complement to local resources, imports will increase by the full amount of the aid inflow. If aid instead substitutes for local resources there is fungibility. In this case aid is instead used for other balance-of-payment items, such as accumulating reserves or decreasing foreign borrowing. The recipient country can also use aid to decrease exports, in which case there is Dutch Disease.

Following White (1994) the balance-of-payment account identity will be used to illustrate the concept of fungibility. By definition the current account should equal the capital account. The current account side of the balance-of-payment account consists of exports (X), imports (M), debt services (DS), other factor payment (OFP), official transfers (OT), and private transfers (PT). The capital account side of the balance-of-payment account consists of concessional long-term capital inflows (CLTC), other capital inflows (OC), changes in reserves (CR), and errors and omissions (EO).[4] The balance-of-payment identity can now be defined as

(1) $X - M - DS + OFP + OT + PT = -(CLTC + OC + CR + EO)$.

The foreign aid (FA) component of the balance-of-payment identity consists of official transfers and concessional long-term capital:

[4] CR is a reduction in reserves.

(2) FA = OT +CLTC.

Substituting foreign aid (FA) into Equation (1) and rearranging yields

(3) M = FA + X - DS + OFP + PT + OC + CR + EO.

We can now discuss this identity in terms of fungibility and Dutch Disease. If foreign aid aimed for imports does not increase imports by the full amount of the aid inflow, then there is fungibility. If the reason is that exports are reduced then the fungibility is of the Dutch Disease form. Assume, for example, that the export incomes of a country are US$100 million, which is used entirely for imports. In terms of Equation 3 there is a US$100 million increase from exports on the right hand side, which is balanced by a US$100 million increase originating from imports on the left-hand side.

Now assume that the country receives US$100 million in aid. If there is no Dutch Disease effect the country has US$200 million that can be used for imports (US$100 million from foreign aid and US$100 million from exports). Consequently, aid, together with the incomes from exports, balances imports (US$200 million) in Equation 3. In this case, the foreign aid inflow raises imports by the full amount. But if foreign aid gives rise to Dutch Disease, exports will fall. If exports fall to US$50 million it implies that the country has US$150 million that can be used for imports (US$100 million from foreign aid and US$50 million from exports). Thus, in this case, due to Dutch Disease, a US$100 million foreign aid inflow increases imports by only US$50 million in comparison with the no aid-counterfactual.

As mentioned above, aid can give rise to other forms of fungibility as well. However, unlike the case when exports decrease, this form of fungibility is not caused by Dutch Disease. For example, aid can be used to build up reserves that will result in imports not increasing by the full amount of the aid inflow. Furthermore, not all forms of aid are intended to increase imports. Aid can, for example, be granted with the intention that it should be used to decrease borrowing or to repay debts. One example of foreign aid with such a purpose is debt relief. In this case all balance-of-payment transactions take place on the right-hand side of Equation 3, an increase in foreign aid in the form of debt relief is counterbalanced by an increase in debt service. For example, a foreign aid inflow of US$100 million intended for debt relief is

accommodated by a US$100 million increase in debt service of US$100 million. Imports are not affected by this transaction.

Different forms of aid and Dutch Disease

It can be expected that different types of foreign aid give rise to different degrees of Dutch Disease. The more foreign aid gives rise to resource movements and the more it increases the possibilities for spending on non-tradables, the greater will be the Dutch Disease effects in the form of real exchange rate appreciation and changes in the structure of production.

Foreign aid can be divided into three different categories — project aid, sector aid, and programme assistance. Project aid is an example of the traditional form of aid, mentioned in the last section, which is motivated by growth theories that see aid as a complement to local saving. Project aid normally is granted with the intention of supporting investments through paying for the import component, while current costs are supposed to be covered locally.

In the category of programme assistance we include budget support, balance-of-payment support, import support, debt relief, etc. Programme assistance on a larger scale was first granted around 1980 as a response to the inability of several aid recipients to cover the local costs of aid projects. To start with, programme assistance was granted as tied import support that made it possible for the recipients to import intermediate goods and maintenance equipment.[5] However, due to its tied form the import support was inflexible, and gradually there was a move towards more untied forms such as balance-of-payment and budget support.

Finally, sector aid is tied to expenditures in a particular sector. It can be questioned whether sector aid should be considered an aid category of its own or whether it should be included in programme assistance. In fact, if there is no restriction on the use of sector aid, in practice it is not different from programme assistance. However, ordinary project aid directed to a particular sector and co-ordinated under a common umbrella is sometimes also labelled sector aid. In this case aid is tied in line with what normally applies to project aid. Consequently,

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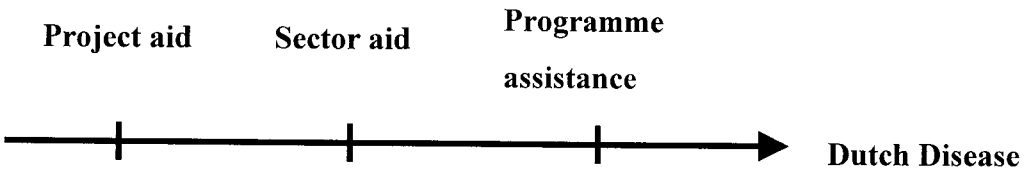
[5] With 'tied aid', we refer to aid tied to a particular use and not, as is usual, aid tied to the purchase of products from the donor country.

since sector aid ranks between project aid and programme assistance when it comes to how freely it can be used, we here choose to treat it as a category by itself.

Figure 1 ranks the three categories of aid according to their propensity to give rise to Dutch Disease. The more to the right on the axis, the higher is the propensity of the aid category to give rise to Dutch Disease.

Project aid has the least propensity to give rise to Dutch Disease (and other forms of fungibility), since it provides donors with the largest possibilities of tying up expenditures to products which the recipient otherwise would not have bought. Thus, with project aid, the risk that aid substitutes for local saving and is used for other purposes than those the donors are interested in supporting is smaller than for the other aid categories. However, this does not imply that project aid cannot give rise to Dutch Disease. If project aid goes to products that the government otherwise would have bought with its own money, there may be a Dutch Disease effect.

Figure 1



Programme assistance is the category of aid that has the highest propensity to give rise to Dutch Disease. Untied budget support and balance-of-payment support have, for example, higher propensity to cause Dutch Disease than tied import support. The extreme case is untied budget support with no conditions attached, since it implies a budget enforcement that allows the government to increase its spending in whatever area it prefers, i.e. there is absolute

fungibility.[6] But import support can also give rise to Dutch Disease, even though it is more tied than balance-of-payment and budget support.

As mentioned, debt relief differs from other forms of programme assistance in that it is not primarily meant for imports. Debt relief can give rise to fungibility depending on whether the recipient would have paid the debt in the absence of debt relief. If the recipient would have paid the debt in the absence of debt relief, the granting of debt relief implies that domestic resources will now be free to use for other purposes. On the other hand, if the recipient would not have paid the debt in the absence of debt relief, the debt relief will not free domestic resources and thereby not give rise to fungibility.

Debt relief can increase resources in another way depending on whether it gives rise to an inflow of foreign capital. If the debt relief alleviates the debt overhang, it implies that investors are more inclined to invest in the country, i.e. there will be a capital inflow that will affect the balance-of-payment in a similar way to the aid inflow.

Finally, since sector aid is not restricted to a particular project, as project aid is, and cannot be used as freely as programme assistance, it ranks between these two aid categories with respect to its propensity to give rise to Dutch Disease.

Aspects of aid other than Dutch Disease

There might, of course, be positive aspects of the forms of aid, which tend to give rise to Dutch Disease, that counterbalance this negative effect. Programme assistance, for example, might have on international sectors positive effects that exceed the negative effects caused by Dutch Disease. These positive effects are due to the fact that the various forms of programme assistance increase the possibility for producers to obtain foreign-produced, intermediate goods. Before deciding on what kind of foreign aid that should be used, it is therefore important to consider both the positive and the negative effects.

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[6] The issue of how useful it is to speak about fungibility when the purpose of the aid inflow is to provide free resources is a matter for discussion.

Thus, even though project aid is likely to give rise to less Dutch Disease effect than other forms of aid, *ceteris paribus*, we can not conclude that project aid is better. There are also other aspects that have to be considered, one such aspect being the cost of administering the aid. The more detailed the rules are for the implementation of aid the higher are the costs. It is to be expected that aid in the form of project aid will generate more costs in the form of planning, administration, control and evaluation in order to fulfil the more specified requirements associated with this form of aid. On the other hand it is quite probable that untied budget support does not need as much administering costs as project aid. Thus, when the form of aid is decided on, it is important that the risk of fungibility is weighed against the cost of administration.

Besides lower administration costs there are other aspects that also weigh in favour of less tied aid forms. One such aspect is ownership, the importance of which has been emphasised in the recent aid debate (e.g. World Bank 1998). It is claimed that with a higher degree of ownership by the local government, i.e. a higher possibility of influencing the areas into which aid is directed, the larger are the possibilities of success. But the possibility of exerting influence depends on how tied aid is: the less tied the aid is the larger is the recipient's possibility of affecting the outcome.

Tied aid, such as project aid, implies limited ownership since there is a risk that it is primarily the donors that set the agenda. Project aid can force the government into areas in which it otherwise would not have chosen to invest. For example, if aid goes into a hospital project there might be conditions attached that force the government to cover local costs. Since the government is under pressure from the IMF and the World Bank to adhere to budget targets, less money is left for spending on projects preferred by the government. Thus, by tying up aid to specific projects, donors determine the agenda for the government.

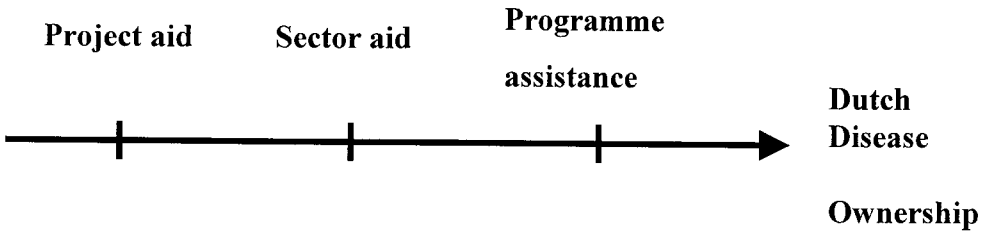
Tied aid also risks negatively affecting budget targets. If current costs are not financed by aid there is a risk that scarce local resources will be used up to cover these costs. Since other budget expenditures also have to be financed, the expenditure targets will be threatened.

Consequently, in addition to measuring the propensity to give rise to Dutch Disease, the axis of Figure 2 also can be used to measure ownership. From the figure we see that a high degree

of ownership tends to go hand in hand with a high propensity to give rise to Dutch Disease. Thus, there is a trade-off between the wish to provide ownership to the government and the desire to minimise Dutch Disease.

Which is then most important, to avoid Dutch Disease or create ownership? There is no general answer to this question. Rather, the importance of the goals depends on the needs of each aid recipient, which in turn are determined by the political and economic situation of the country. Thus, it is up to each donor to decide whether a low level of Dutch Disease or a high degree of ownership is most important.

Figure 2



Finally, an aspect not directly related to how tied aid is, but still of importance when Dutch Disease effects of aid are discussed, is how different forms of aid affect productivity. We have seen that aid gives rise to Dutch Disease through its price increasing effects. However, even though aid can fuel inflation through spending and resource movement effects, it can also contribute to a downward pressure on prices. Through increasing productivity some forms of aid contribute to lower production costs. An example of aid that increases productivity is aid that results in the improvement of human capital, in the form of education or health, or technological transfers.[7] Another example of how aid can result in a downward pressure on prices is when it removes bottlenecks caused by, for example, lack of skilled labour or poor

[7] Joseph Stiglitz (1998), in his Post-Washington Consensus emphasises the importance of human capital and technological transfers not only for economic growth but also for the achievement of other development goals such as sustainable development, increases in living standard, and equitable and democratic development.

infrastructure and communication. Thus, each form of aid has to be analysed to ascertain whether the inflation fuelling or the inflation checking effects dominate.

Aid and macroeconomic performance

In this section the development of aid and the Mozambican macroeconomic performance during the 1990s are presented. Due to the low number of observations we are restricted to a bivariate analysis based on diagrams in which the development of aid and various economic variables are compared. The drawback of such an analysis is that it does not consider the effects of other factors that have also affected the Mozambican economy during the studied period.[8] Examples of factors exogenous to the aid inflow are changes in international interest rates, exchange rates, and terms-of-trade. In addition extreme climatic conditions in the form of droughts or floods have affected the way the Mozambican economy has developed. Due to the impact of these other factors, a bivariate analysis can only be expected to detect the effects of aid in cases when these effects are substantial. The restriction imposed by this form of analysis implies that the result has to be interpreted with caution. Consequently, this section should be considered more a basis for further discussion of the impact of aid on the Mozambican economy than an attempt to state any definite relationship between aid inflow and macroeconomic performance.

A positive Mozambican macroeconomic development during the 1990s — growth has increased, inflation has decreased, and budget and external balances have improved substantially — sets the context of our analysis (Table 1). In particular during the last three years the economic performance has been impressive. Between 1996 and 1998 growth on

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[8] When analysing Mozambican economic variables there are problems with the quality of the data and the low number of observations. As a result, it is important to treat any conclusions with caution. In the analysis we have used existing data series based on statistics from the Mozambican Government, the Bank of Mozambique, and the IMF. As a result of a statistical review of the national accounts for 1996-97 by the National Statistics Institute (INE), the nominal GDP for 1997 has been upgraded by about 25 per cent and the relative importance of the demand components have been changed. Statistics from earlier years have not been revised which add to the inconsistency of the time series (IMF 1999).

average increased by 9.8 per cent and inflation averaged 6.9 per cent which can be compared with 6.6 per cent and 36.5 per cent respectively for the entire period 1990-98.[9]

Table 1 Macroeconomic indicators 1990-98 (per cent)

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*
Real GDP growth rate	1,0	4,9	-0,8	18,8	4,5	1,4	6,2	11,3	11,8
Inflation rate	47,1	35,2	54,5	43,6	70,2	57,0	16,2	5,8	-1,3
Export growth	20,6	28,4	-14,2	-5,4	24,4	6,3	29,7	1,7	7,9
Current account deficit[a,b]	255,6	202,2	204,0	221,8	210,9	145,2	118,8	106,6	138,8
Official transfers[b]	149,6	137,4	138,0	135,4	137,7	72,8	52,4	54,7	53,9
Overall budget deficit[a,c]	58,8	53,4	55,4	52,6	62,8	53,2	48,6	49,8	48,2
Grants received[c]	34,0	41,4	44,0	40,5	45,5	40,4	33,7	38,9	37,2

Source: Bank of Mozambique and the IMF

a) before grants

b) as percent of exports of goods and services

c) as per cent of total budget expenditure and net lending

Foreign aid

Figure 3 shows the aid inflows to Mozambique during the 1980s and the 1990s. As a result of the launching of the Economic Rehabilitation Programme (PRE) in 1987, supported by the IMF, foreign aid on a larger scale had started to arrive from Western bilateral and multilateral donors.[10]

As the figure shows, estimations of the size of the Mozambican aid inflow differ between the UNDP and the OECD. The OECD figures for pre-1990 aid inflow are lower than the UNDP figures, while this pattern is reversed for post-1990 aid inflow. In particular, for the period 1991-94, the OECD figures show much higher values for the aid inflow than the UNDP figures.

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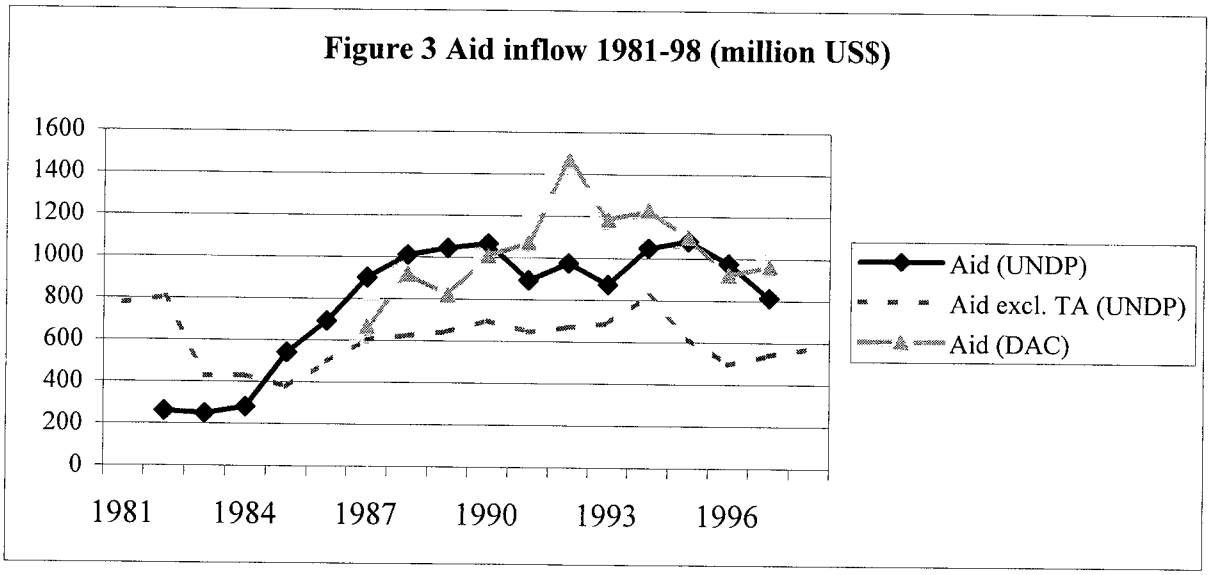
[9] Note that the relatively high average growth rate for the period 1990-98 is boosted by the 18.8 per cent growth rate of 1993.

[10] During the 1980s a considerable share of the capital inflows came from the Soviet Union and its allies.

A possible explanation for the discrepancy between the different sources is that the UNDP figures are collected in Mozambique while the OECD figures are based on information that comes directly from the donor countries. Different views about which transactions are regarded as aid can also have contributed to this discrepancy. It can be suspected that donors define aid in a wider sense than the recipients do, which could explain the larger OECD figures. Finally, it is possible that the discrepancy between the figures can be explained by genuine uncertainty about the true figures.

Figure 3 Aid inflow 1981-98 (million US$)



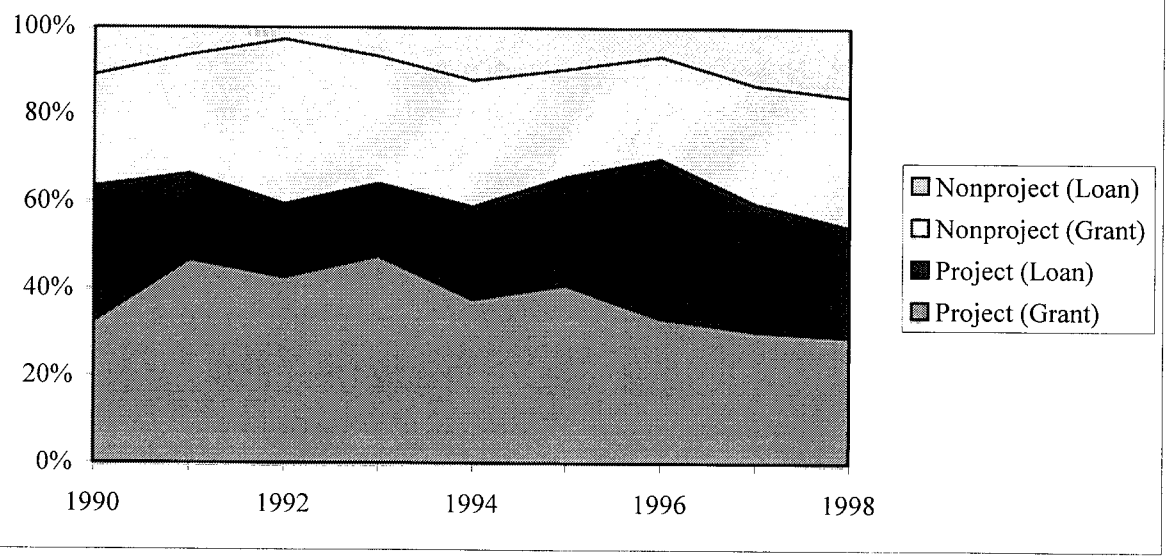
Sources: UNDP (1999) and OECD (1998)

According to the OECD the foreign aid inflow increased sharply during the second half of the 1980s and reached a peak in 1992 of more than US$1.4 billion. Thereafter the aid inflow decreased and in 1997 it fell to around US$1 billion. The large inflow during the first half of the 1990s meant that foreign aid constituted more than 100 per cent of GDP between 1992 and 1994. This high figure should be considered in the perspective of aid inflows that were exceptionally large due to the peace agreement in 1992 and the democratic elections in 1994. In addition, during this period the Mozambican economy was run down due to war and climatic calamities. The economic growth since then implies that aid as a proportion of GDP has decreased. Compared to the OECD aid figures the UNDP figures give the impression that the aid inflow was considerably smaller during the first half of the 1990s.

UNDP also reports the figures for aid flows exclusive of technical assistance (Figure 3). These figures give a better picture than the total figures of how much aid actually enters the Mozambican balance-of-payment. Therefore, in our analysis we use the UNDP figures exclusive of technical assistance.

Figure 4 shows that the importance of project aid versus non-project aid as a source for financing government expenditures has decreased during the 1990s. In 1990 project aid constituted 63.5 per cent of total ODA while in 1998 the corresponding figure was 54.5 per cent. Thus, aid to Mozambique follows the prevailing trend of increased importance for nonproject aid. In another respect, however, Mozambique deviates from the general pattern. From the figure it can be observed that the share of loans in total aid so far during the 1990s have only decreased by 1 per cent from the 1990 level of 57.9 per cent. In this respect the development in Mozambique goes against the present trend towards an increased share of grants in total aid.

Figure 4 Project and nonproject aid 1990-98 (per cent)

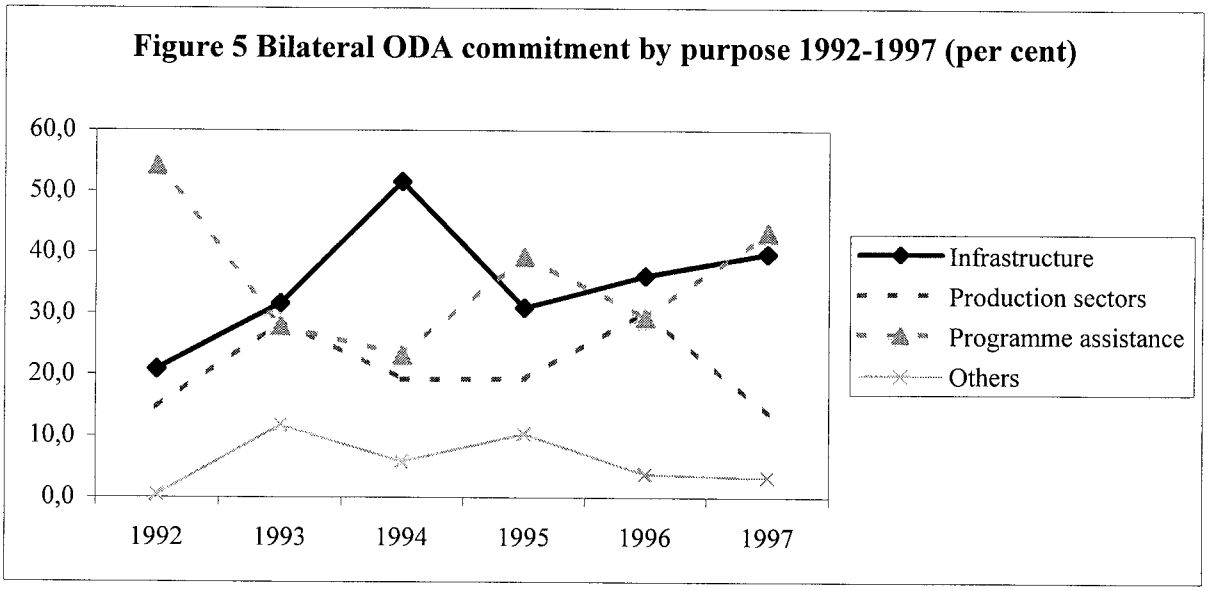


Sources: Bank of Mozambique and IMF

OECD divides aid according to commitment by purpose. Figure 5 shows that aid committed during the period 1992-97 can be divided into four major groups; 'infrastructure', 'production

sectors', 'programme assistance', and 'others'.[11] The 'infrastructure' group, in which we find both social and economic infrastructure and services, shows an increasing trend during the period. 'Social infrastructure and services' includes education, health, water supply and sanitation, etc. In particular the shares accruing to education and health have increased during the studied years.

Figure 5 Bilateral ODA commitment by purpose 1992-1997 (per cent)



Note: 'Infrastructure' includes social and economic infrastructure and services, 'Production sectors' includes multisector assistance, 'Programme assistance' includes food aid and actions related to debt, and 'Others' includes emergency assistance and unallocated/unspecified.
Source: OECD (1998)

The 'economic infrastructure and services' group includes energy and transport and communication, whose shares both have increased during the period. Aid committed to the 'production sectors' group shows a stagnating trend. In this group, multisector assistance is largest followed by trade and tourism and agriculture. In the 'programme assistance' group, actions related to debt constitute a major part, implying that annual changes in debt relief have a large impact on the development of this group. In addition this group includes food aid. Finally, 'others' shows a decreasing trend during the period due to a fall in the need for emergency assistance.

[11] For a more disaggregated presentation of committed aid see Table A.6.

Government budget

Total Mozambican budget expenditure is still considerably larger than revenues which, in 1998, left Mozambique with a budget deficit before grants amounting to MT 4,923 billion or 10.5 per cent of GDP (IMF 1999). Table 1 shows a decreasing trend for the budget deficit as share of total expenditure and lending during the 1990s. Even though the budget deficit remains large, there have been significant structural improvements both on the expenditure and the revenue side. Privatisation has resulted in subsidies to state-owned companies being decreased considerably, thereby making more resources available for the social sectors. On the revenue side, there have been significant improvements in the collection of taxes, for example through the privatisation of customs services.

Table 1 indicates that aid by far has been the most important source for financing the budget deficit during the entire 1990s. However, the table also shows that the share of aid in total budget expenditure and net lending has decreased slightly during the 1990s, indicating a small decrease in the aid dependency of the Government. In 1998 grants were evenly distributed between project aid and funds made up by countervalue from the balance-of-payment support.

To finance the deficit after grants the Government relies on external borrowing. Since 1994 external borrowing has been large enough not only to cover the budget deficit but also to make net repayments to the banking system. In 1997 and 1998, external borrowing was 226 per cent and 197 per cent respectively of the deficit after grants.

Monetary policy and prices

An expansive monetary policy in combination with the inflationary effects of the large devaluations of the Metical and the deregulation of prices largely explains the high inflation during the first half of the 1990s (Table 1) (IMF 1998:8). However, it is also possible that foreign aid contributed to this development. As Figure 6 indicates, increases (decreases) in aid did go together with increases (decreases) in inflation up to 1996, which supports the hypothesis of the Dutch Disease theory that the spending effect of aid affects prices. In particular, it is noteworthy that inflation peaks in 1992 and 1994, i.e. the years of the large aid inflows due to the peace treaty and the democratic elections respectively. Since 1996 this pattern has been broken, with inflation going down in spite of increasing aid inflows.

The most important explanation of the fall in inflation is the privatisation of Banco Commercial of Mozambique (BCM) in 1996 and the accompanying financial reforms, which resulted in improved monetary control and thereby better possibilities for the Bank of Mozambique to implement a tighter monetary policy. The increase in broad money (M2) fell from 38.0 per cent in 1995 to 20.3 per cent in 1996. In spite of tightening of the monetary policy, net foreign assets were allowed to increase and the adjustment was accommodated through a decrease in net domestic assets instead. Primarily it was credit to the Government (which met its debt repayments to the Bank of Mozambique) that was curtailed, while increases in credit to the private sector has remained at a high level. Thus in 1997 and 1998, in response to increased money demand and an increase in the money multiplier, the Central Bank allowed broad money (M2) to increase by 24.4 and 17.9 per cent respectively and credit to the private sector by 31.8 and 16.5 per cent respectively (IMF 1999).

As a result of the restructuring of the financial system, inflation fell from 57 per cent in 1995 to 16.2 per cent in 1996. The rate of inflation has remained on a low level — in 1998 prices were even falling — which, in addition to the strict monetary policy, can be explained by factors such as an exchange rate that has stabilised against the dollar and several good harvests.

Even though the monetary tightening since 1996 seems to have been a more important determinant of the development of prices than the changes in the aid inflow, it is probable that aid has indirectly affected prices through conditionality. The accomplishment of budget and monetary targets by the government has been a condition for continued support not only by the multilateral but also by the bilateral donors.

Nominal exchange rate

Before the reform program, the Metical was heavily overvalued with a parallel market rate that was 40 times the official rate (IMF 1998:34). By means of a large number of devaluations, a unification of the official, market and parallel exchange rates was achieved in 1992. The Metical continued to depreciate against the dollar after the exchange rate

Figure 6 Foreign aid and CPI (1990=100)

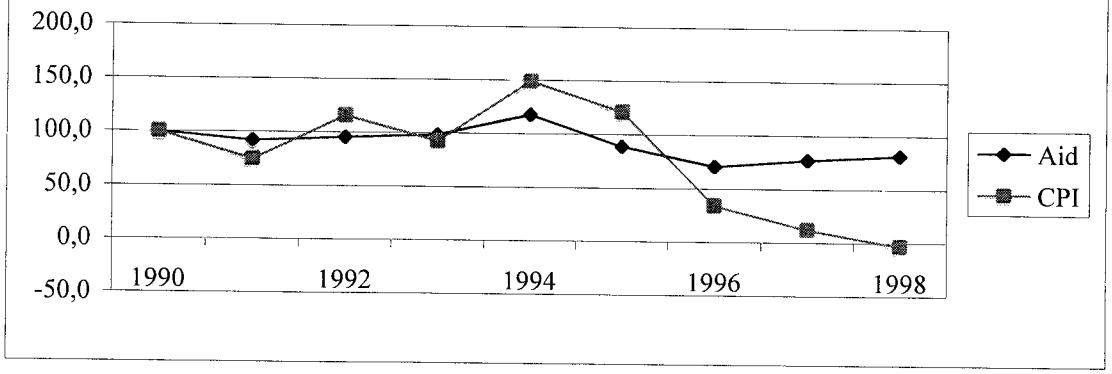
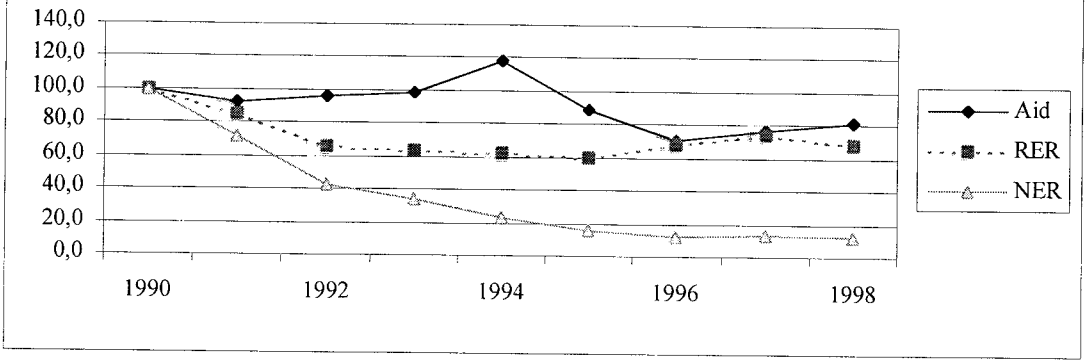


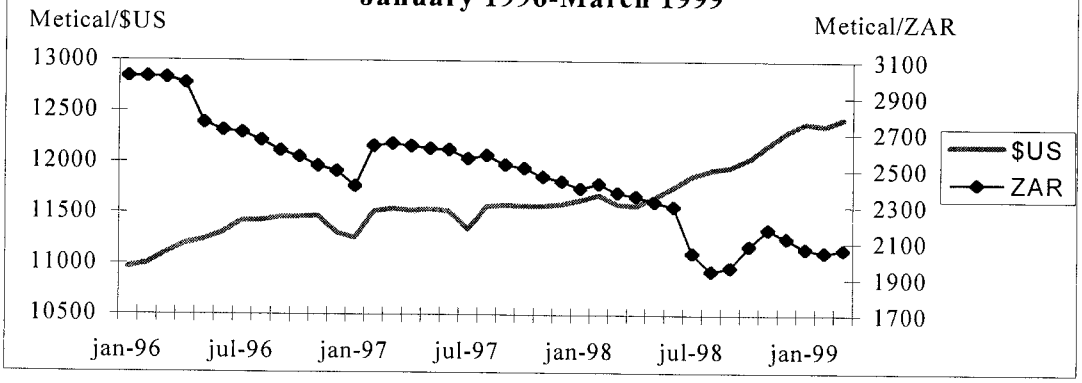
Figure 7 Foreign aid, RER and NER (1990 =100)



Note: RER – real exchange rate, NER – nominal exchange rate

An increase in RER/NER is an appreciation

Figure 11 Metical against US dollar and South African rand January 1996-March 1999



Sources: Bank of Mozambique, UNDP, and IMF

became market determined in 1993 (IMF 1998:34). However, this depreciation slowed, and since the third quarter of 1995 there have only been relatively small losses against the dollar. In 1997 and 1998 the Metical depreciated by 1.5 per cent and 7.1 per cent respectively against the dollar. Between January and April 1999 the Metical depreciated by 1.5 per cent.

Figure 7 shows the development of foreign aid and the trade-weighted nominal exchange rate. From the Dutch Disease theory we expect increased aid to have an appreciative effect on the nominal exchange rate, *ceteris paribus*, and vice versa. This implies that the two curves of the figure can be expected to move in the same direction. This is the case between 1990-91 and 1994-96 when aid falls and the nominal exchange rate depreciates, and 1996-97 when an increase in aid goes together with an appreciation of the nominal exchange rate. However, for the other years covered by Figure 7 the two indexes move in opposite directions. Thus, from the figure it is not possible to detect a particular pattern for the development of the nominal exchange rate and prices.

Real exchange rate

The real exchange rate depreciated sharply until 1992, thereafter the rate of depreciation slowed down (Figure 7). During this period, first the large nominal devaluations and then a floating nominal exchange rate more than offset the appreciative effect of inflation, yielding a depreciative net effect on the real exchange rate. The fall in inflation in 1996 implied that the need for counteracting depreciations of the nominal exchange rate had disappeared. In 1996 the devaluation of the South African rand led to a weak appreciation of the real exchange rate. However, by 1997 this development had already turned into a slight real depreciation due to the continued decrease in inflation. The exchange rate stability during the last few years reflects the increased confidence in the Mozambican economy that has followed the restructuring of the financial system and the monetary tightening.

What impact did aid have on the development of the real exchange rate? As with the nominal exchange rate, we expect an appreciation of the real exchange rate when aid increases, *ceteris paribus*. Therefore, if foreign aid gives rise to Dutch Disease, the two curves of Figure 7 are likely to move in the same direction. The figure shows that development of the real exchange rate was positively correlated with the aid inflow for the years 1990-91 and 1994-95 when aid

decreased and the real exchange rate depreciated, and 1996-97 when an increase in aid was accompanied by an appreciation of the real exchange rate. The two indexes move in opposite directions for 1991-94 and 1997-98 when aid to Mozambique increased and the real exchange rate depreciated. The ambiguous result of this bivariate analysis implies that we can not draw any distinct conclusions about the impact of aid on the real exchange rate.

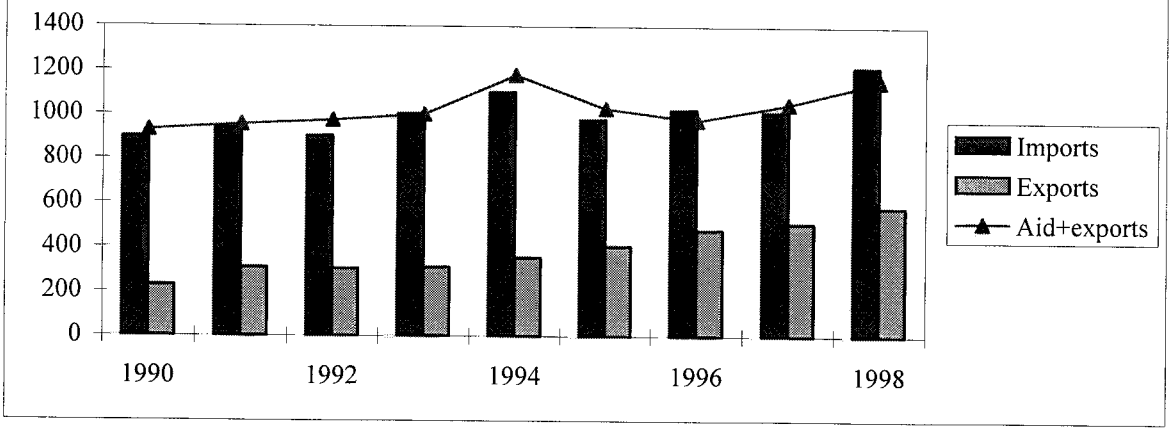
External balance

The current account deficit gives a measure of aid dependence, and, as a share of exports of goods and non-factor services, shows a decreasing trend during the 1990s (Table 1). Between 1994 and 1997 the current account deficit decreased by almost 30 per cent. However, a 30 per cent increase in the deficit in 1998 wiped out much of this improvement.

The Mozambican current account deficit in 1998 constituted 139 per cent of exports of goods and non-factor services which, even though it is a deterioration in comparison with 1997, still is a considerable improvement in comparison with 1986 when the current account deficit was more than three times the size of exports of goods and non-factor services (IMF 1998:8). The current account deficit is also sizeable after grants have been included (in 1998 the current account deficit after grants was 85 per cent of exports of goods and non-factor services). The major sources for financing the current account deficit have been foreign borrowing and debt relief.

The 1998 deterioration of the current account reflects deteriorating trade and service balances. Lower worker-remittances from South Africa and increased imports of services, in connection with the construction of the aluminium smelter Mozal, explains the deterioration in the services balance. Imports were more than three times the value of exports in 1998. The deterioration of the trade balance was caused by increases in imports that were significantly larger than export increases. Exports did not increase as much as expected due to a halt in the export of electricity to South Africa caused by disagreement about tariffs. Last year's deterioration of the trade balance implies that the trend during the 1990s towards a smaller trade deficit has been broken.

Figure 9 Exports, imports and aid (US$ million)



Sources: Bank of Mozambique, UNDP, and IMF

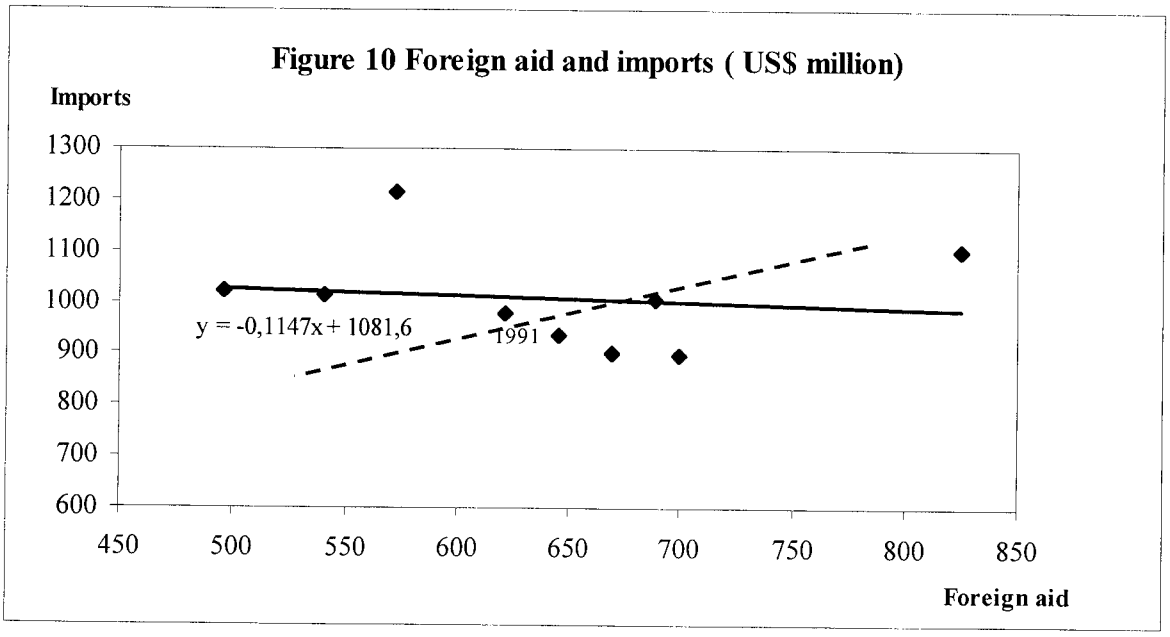
How has aid then affected the external balance? In Figure 9 we see that aid, together with exports for most years, more or less equals imports. This suggests that aid has not given rise to forms of fungibility other than Dutch Disease, since exports and aid otherwise would have been larger than imports. Then, has aid given rise to the Dutch Disease form of fungibility?

From the Dutch Disease theory we expect that foreign aid, through its deteriorating effects on competitiveness, will result in decreasing exports. If the Dutch Disease hypothesis holds, we expect that aid and exports in Figure 8 will move in opposite directions, i.e. if aid increases, exports will decrease, *ceteris paribus*. This is actually the case for some of the observations: the decrease in aid in 1991, 1996, and 1997 was accompanied by an increase in exports, while during the years 1992 and 1993 aid increased and exports decreased. For the years 1994, 1997 and 1998 aid and exports moved in the same direction, which consequently does not correspond to the Dutch Disease scenario.

Turning to the import side we expect imports to increase by the full amount of the aid inflow if there is no Dutch Disease. Figure 10 shows a scatter plot of imports against aid for the period 1990-98. Taking 1991 as a starting point, the dotted line shows the one-to-one relationship between aid and imports which would exist if there were no Dutch Disease. With a one-to-one increase in aid we expect an increase of aid by, for example, US$100 million to be reflected in an increase of imports by US$100 million, i.e. a positive relationship. The full-drawn line shows the actual relationship between aid and imports for the period 1990 to 1998.

The slope of this line indicates a negative relationship between aid and imports; i.e. higher levels of aid correspond to lower imports. If Figure 10 is interpreted exclusively in Dutch Disease terms, it suggests that exports not only decrease as a result of the aid inflow, but that it decreases by an amount that is larger than this inflow, resulting in a negative net effect on the Mozambican capacity to import.

Figure 10 Foreign aid and imports (US$ million)



Sources: Bank of Mozambique, UNDP, and IMF

However, the figure has to be interpreted with caution. Besides the fact that the figure says nothing about the causality between aid and imports, it does not take into account other variables that may have an impact on the development of imports. A closer examination shows that the six observations situated more to the right of the figure, i.e. those characterised by relatively low imports and high aid inflows, are from the period 1990-95 while the three observations on the left are from the period 1996-98. This indicates that the development of factors other than aid, economic and political, has been important in determing the level of imports during the 1990s. The impact of these factors on imports might contribute to explaining the negative relationship between aid and imports shown in Figure 10.

Sector development

If the Dutch Disease theory applied to the case of Mozambique we would expect aid granted to Mozambique to result in resource reallocations disfavourable to the sectors of the economy not receiving aid. Furthermore, through its effects on the real exchange rate we would expect negative effects on the sectors exposed to international competition, such as, for example, agriculture. This would be the more serious since agriculture is one of the few areas in which Mozambique probably has a comparative advantage. Agriculture is also of special importance since it employs 80 to 90 per cent of the working population (Cravinho 1998:720). How does this scenario then correspond to the Mozambican sector development?

Table 2 Gross output (in per cent of gross output)

	1993	*1994*	*1995*	*1996*	*1997*
Agriculture and livestock	26,4	25,0	25,5	27,5	26,3
Industry and fishing	15,5	15,2	17,2	18,2	17,9
Construction	10,5	11,9	12,2	11,7	11,2
Transport and communications	14,4	13,0	12,5	10,7	11,3
Services	33,2	34,9	32,6	31,9	33,2
GDP	100	100	100	100	100

Sources: Ministry of Planning and Finance and IMF

Table 2 shows that in spite of smaller changes in individual years, the sector structure has remained largely unchanged during the period. Thus, even though there have been large changes in the aid inflow during the studied period, it is not possible to discern any particular pattern in sector development that supports the Dutch Disease theory.

Due to resource movement effects aid is likely to give rise to resource allocations not only between sectors, but also between urban and rural areas. During the 1990s, Maputo has strengthened its position as the economic and political centre of Mozambique. In addition, a major share of the activities of the donor organisations is located in the capital. Thereby aid contributes to the heavy concentration of economic activities in Maputo. In Dutch Disease terms, the Maputo area has become a 'booming sector' that attracts resources through prices and wages higher than elsewhere in the country. As a result, many people migrate from the

rural areas motivated by the hope of finding employment. Thus, aid risks increasing the economic and political imbalance between Maputo and the rural areas.

Aid and macroeconomic performance - summary

The above presentation gives a mixed result with respect to the impact of foreign aid on the macroeconomic development. Even though no general pattern of economic development in support of the Dutch Disease theory can be detected, the development of several macroeconomic variables to some extent corresponds with what can be expected from this theory. One example is changes in prices that up to 1996 seemed to reflect changes in the aid inflow. Furthermore, for some of the observations the changes in the nominal and real exchange rates are in line with the Dutch Disease theory.

The effect of aid on exports is ambiguous. During the first half of the 1990s the export development was in line with the Dutch Disease theory, but, during the last few years this pattern has been broken with exports increasing in spite of increases in the aid inflow. The changes in the aid inflow only partly seem to provide an explanation of the increases in imports during the 1990s. Factors other than aid, such as growth and export performance, might well explain much of the import development.

The sector structure seems unaffected by changes in the aid inflow, contrary to the Dutch Disease theory claims that there will be an outflow of resources from sectors exposed to international competition, and an inflow to the sectors that produce for the domestic market.

To conclude, our analysis does not provide much evidence in support of the hypothesis that aid has affected the macroeconomic variables in the way suggested by the Dutch Disease theory. The economic development does not even seem to have reflected the changes in aid during the periods 1993-94 and 1994-96, when there were significant increases and decreases respectively in the aid inflow.

However, even though our bivariate analysis does not show any clear-cut relationship between aid and the macroeconomic variables, this does not exclude the possibility that such a relationship in fact exists. It may just be that other variables have more than offset the effects

of aid on the real exchange rate. Thus, aid may have an impact, but other variables have been more important in determing the development of the macroeconomic variables.

Dutch Disease in Mozambique?

The previous section focused on the possible relationship between the rate of change of the aid inflow and different macroeconomic variables. Even though it can not be shown that the exchange rates and other economic variables reflect all fluctuations in the aid inflow, it should be beyond doubt that the aid inflow, which is more than twice the size of the incomes from exports of goods, does affect the economic performance. Therefore, in this section we focus on the level of the aid inflow and its expected impact on the economy.

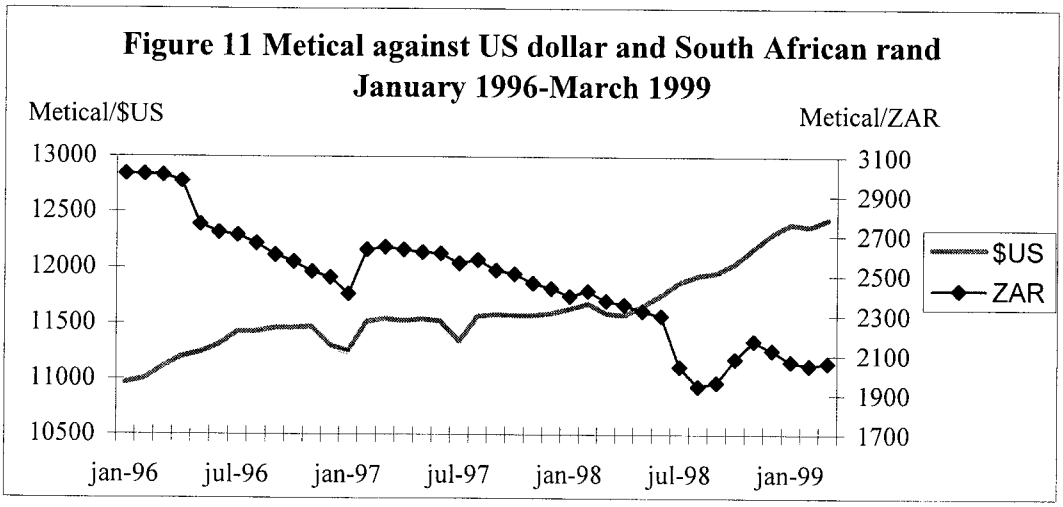
Aid, the real exchange rate, and the external balance

The large aid inflow should be one of the most important explanations of the stable development of the exchange rate during the 1990s. It is probable that if this aid inflow stopped, there would be an immediate depreciation of the exchange rate. Foreign aid contributes to the stability of the exchange rate in several ways. First, it creates a demand for the Metical. Second, through conditionality and by providing financial support, aid makes it possible for the government and the Bank of Mozambique to hold on to a tight economic policy. Third, continued aid serves as a signal to private investors that the Mozambican economy is on the right track. Thus, we can conclude that Mozambique today has a more appreciated real exchange rate than it would have without foreign aid.

What is then the impact of the real exchange rate on exports? Figure 8 shows that exports have increased since 1993. Even though it can be argued that this growth takes off from a very low base due to the war, the development still indicates that the level of the real exchange rate has not been a major impediment to increases in exports. The analysis of the previous section supports this conclusion. Exports do not seem to have been sensitive to changes in the real exchange rate. For example, the increase in aid during 1997 and 1998 went hand in hand with an export increase, contrary to what is to be expected from the Dutch Disease theory.

One explanation of why the effects of aid on prices and exchange rates do not seem to have passed through to the real variables of the economy is that the supply elasticity of changes in structural factors is larger than the supply elasticity of changes in prices and exchange rates. This would imply that structural factors are more important than prices and exchange rates in determing output and export performance in Mozambique. The development level of human capital, infrastructure and communication is still very low in Mozambique, which implies that large barriers to production and trade exist. For example, opening up the possibilities for transporting goods by improving roads or other infrastructure might therefore be more important than price changes for increasing trade.

Figure 11 Metical against US dollar and South African rand January 1996-March 1999



Note: a decrease in the exchange rate is an appreciation

Sources: Bank of Mozambique and Banco Austral

Finally, when the export performance is explained it should also be taken into account that the real exchange rate is trade weighted, i.e. it is constructed from the development of the currencies and price indices of the most important trading partners of Mozambique. The currencies with the heaviest weight in this index are the US dollar and the South African rand. These two currencies have, in the last few years, developed in opposite directions; the Metical has depreciated against the US dollar and appreciated against the South African rand (Figure 11). Thus, the relative stability of the real exchange rate index disguises the fact that the

competitiveness of the Metical has developed in opposite directions for the two most important currencies.[12]

The depreciation of the Metical versus the US dollar implies that Mozambican competitiveness on export markets has improved since its most important export products, such as cashew nuts, cotton, prawns, and logging, are sold in the world markets and priced in dollars. Thus, the depreciation of the Metical against the dollar is likely to have positively affected the exports of these products, *ceteris paribus*.

On the other hand, a large share of imports comes from South Africa. It is estimated that 30 per cent of total imports and up to 80 per cent of all food that is consumed in the Maputo area is imported from South Africa. As a result of the appreciation of the Metical against the rand, the South African imports have become less expensive.[13] However, even though Mozambican imports increased during 1998, they, like the exports, seem to have been rather insensitive to the exchange rate development during the 1990s. Other factors have been more important for determing imports. Examples of factors that have had an import decreasing impact are improved import competition following privatisation and more efficient customs handling (IMF 1998:9). However, even though border controls have improved, it is probable that much of the actual imports are not registered and accounted for due to smuggling and exemptions. Thus, official figures do not fully reflect the actual imports.

The counterfactual to aid

Even though aid-caused Dutch Disease only seems to have a limited effect on the Mozambican economy, it can always be claimed that the economic performance would be even better if there was no aid. Then, what would such a counterfactual to aid look like and would it imply an improvement in comparison with the present situation? [14]

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[12] For the full effect on Mozambican competitiveness the price developments in the USA and South Africa also have to be considered.

[13] This development to some extent has been counteracted by higher inflation in South Africa than in Mozambique.

[14] White (1999) constructs counterfactual scenarios to the no-aid situation that differ in how Mozambique meets its debt obligations. All scenarios imply a sharp drop in imports and an accumulation of arrears.

We have claimed that foreign aid contributes to keeping the exchange rate on a higher and more stable level than would be possible if there was no aid. A scenario without foreign aid would imply a sharp depreciation of the exchange rate and thereby also an increase in the competitiveness, *ceteris paribus*. However, in order for the country to reap the gains of increased competitiveness it is required that there is a supply response to the depreciation of the currency. However, as argued above, it is probable that the supply elasticity is quite low due to structural factors such as poor infrastructure and communication. Thus, it can be doubted whether Mozambique at present would be able to benefit from the improved competitiveness, in particular since, with aid withdrawn, there would be no resources to overcome the structural obstacles of the economy.

The potential to get rid of structural bottlenecks in the economy would drastically decrease since a withdrawing of aid implies that many investments in human capital, infrastructure and communication would be stopped. Higher price increases in turn would make private investors lose their confidence in the economy, which would further delay necessary structural improvements.

It can also be doubted whether the *ceteris paribus* assumption holds, i.e. whether there would actually be a real depreciation and an improvement in competitiveness in the case without aid. The reason is that a depreciation of the nominal exchange rate would result in imported inflation. Furthermore, with no aid the government would be forced to find other means of financing its expenditures. With tax bases that are small and undeveloped, the risk is obvious that the government would devolve to financing expenditures through printing money and thereby contribute to fuelling the inflation.

Thus, when the effects of aid are assessed it is important to weigh positive against negative effects. The low income, the undeveloped infrastructure and the poor level of education and health all contribute to the enormous needs of Mozambique, and imply that the positive effects of aid at present outweigh the negative effects in the form of Dutch Disease. Furthermore, taking into account the low development level of Mozambique, it is to be expected that in the coming five-year period (and probably longer) the negative effects of aid will be incidental to its positive effects.

Different forms of aid

It was shown above that project aid as a share of total aid to the government decreased by 9 per cent during the period 1990-98. Instead the less tied nonproject aid increased primarily in the form of budget support. This development has been questioned by some donors, due to worries that aid is not used in areas prioritised by the donors. Consequently, there have been suggestions to increase the tiedness of aid once again. In addition, there is another potential advantage of increasing the degree of tiedness of aid. In line with our analysis of different forms of aid it is possible to argue that more tied aid increases the possibilities of avoiding fungibility, and thereby also Dutch Disease.

In spite of these arguments in favour of more tied aid, there are strong arguments for keeping aid to Mozambique untied. As shown above there are negative effects from tying aid: the ownership of the government decreases in pace with the increasing influence of the donors, domestic financing of the current costs implies a threat to the government's own preferred projects and budget targets, and the administration costs increase both for donors and recipient with more tied aid.

Which of the arguments presented in favour of and against more tied aid weigh heaviest in the case of Mozambique? Starting with the question of ownership it seems clear that tied aid severely restricts the government's freedom to undertake its preferred projects, in particular since the government is also under pressure from the IMF and the World Bank to stick to the budget targets.

With the requirement from donors that the recipient has to cover local costs of aid projects, it is primarily the government's own projects that have to be sacrificed. White (1999) shows that the counter value of aid in Mozambique during the 1990s has neither been used to increase expenditures nor as a means to decrease revenue collection, but instead to cover the budget deficit. Furthermore, White argues that it is the expenditure side that has accommodated the fall in aid during the second half of the 1990s. Even so, in 1997 and 1998, current expenditures increased at a higher rate than revenues (IMF 1998). One reason behind the increased expenditure is the requirement from donors that Mozambique should contribute to the current expenditures of aid projects.

We can thus conclude that further tying of aid to Mozambique would increase the tension between the possibilities of the government to conduct its own preferred policy on the one hand, and the ability to respond to the requirements of bilateral and multilateral donors on the other.

Turning to the Dutch Disease effects of different forms of aid, it first should be stressed that it is difficult to completely avoid Dutch Disease and other forms of fungibility by tying aid. Dutch Disease can only be completely avoided if aid is fully tied to products which the recipient otherwise would not buy (it can be questioned whether such aid is of any use to the recipient). Thus, even though aid is tied, it is difficult for donors to get full control over how their money is used due to fungibility.

Furthermore, our presentation of the Mozambican economy indicates that Dutch Disease effects are smaller than the positive effects of aid. With Dutch Disease not an immediate problem for the Mozambican economy, the argument that tied aid raises the possibilities of avoiding Dutch Disease is of less relevance.

Programme assistance and the build-up of reserves

In Mozambique, the balance-of-payment support has made it possible to accumulate international reserves that in 1998 were estimated to cover 6.7 months of imports of goods and non-factor services (IMF 1999). The use of balance-of-payment support to build up international reserves instead of using it for development purposes has been questioned and raised concern about whether Mozambique really is able to use all the assistance it receives. It has also resulted in demands that Mozambique first ought to spend these reserves before it receives new assistance.

Even though the use of aid to build-up reserves can be considered a form of fungibility, there are some advantages with this procedure. Starting with the question of whether the government should be allowed to use aid for reserve purposes, it is worth pointing out that one important purpose of programme assistance is to help the aid recipient to balance its external affairs. To achieve this goal may require the build-up of reserves, in order for the country to

be able to accommodate changes in trade and capital flows. From this perspective, the Mozambican use of part of the aid inflow for reserves can not be considered a problem.

Turning to the issue of the optimal size of the reserves, it has to be taken into consideration that changes in the balance-of-payment flows can be expected to be larger and more volatile for developing than for more developed countries. The reason is the undeveloped state of capital and financial markets and dependence on the development of a handful of primary products for trade that characterise many developing countries. Mozambique is no exception with an economy sensitive to external and internal economic shocks. Examples of potential sources of external shocks are developments on international financial markets and the political and economic development in South Africa. The great dependence on the agricultural sector makes droughts and floods possible domestic threats to a stable economic development. Another potential domestic source of imbalances is the internal political development. To be able to cushion the impact of possible shocks, it is not unreasonable that Mozambique builds up reserves that are relatively larger than is usual for more developed countries.

There are also other aspects in favour of not restricting the use of balance-of-payment support for the accumulation of reserves. A rule that penalises the build-up of reserves, based on the argument that such accumulation indicates inability to absorb aid, would affect the behaviour of the recipient. To avoid a cessation of the aid inflow, the incentives of the recipient would be to spend aid as fast as possible in order to show the absorption capacity. As a result, the risk increases that projects that are badly timed and/or have low productivity will be carried through. From this it follows that when the size of reserves is decided upon it is important not to focus only on its magnitude at a particular point in time. It is more important that the reserves are balanced around their optimal level in the longer term.

From a Dutch Disease point of view there are also reasons why the recipient should be allowed to accumulate reserves. Foreign aid that is used for reserve purposes does not give rise to an appreciating demand for the domestic currency and thereby not to Dutch Disease. Thus, by allowing Mozambique to place aid temporarily in international reserves, an

instrument for exchange rate management is created which can contribute to the minimisation of Dutch Disease effects.[15]

Finally, due to the reform programme the possibilities of increasing domestic credit have been limited during the last few years. Even though credit to the private sector has been allowed to increase, credit to the government has decreased as indicated by the positive net saving of the government (see above). Consequently, the build-up of international reserves is a way for the Bank of Mozambique to accommodate the demand for money.

Fungibility of debt relief?

The debt burden of Mozambique is considerable, in particular in consideration of the low GDP of the country. The economic reforms and progress have qualified Mozambique for the Heavily Indebted Poor Countries (HIPC) initiative by the IMF and the World Bank. In June 1999 it was announced that the country was to receive a close to US$3.7 billion debt relief (corresponding to US$1.7 billion in net present value terms) under this initiative. The HIPC debt relief, which is on top of traditional debt relief, will, according to the World Bank, reduce the external debt from US$2.7 billion to US$1 billion.

The HIPC initiative implies a drop in debt service. For the period 1999-2005 it is estimated that Mozambique will pay an annual average of US$73 million in debt service, which can be compared to the US$169 million that would have to be paid without the HIPC initiative. According to the World Bank the debt service as share of exports will decrease from 19 per cent in 1998 to 8 per cent in 2001. Debt service as a share of government revenues will decrease from 23 to 10 per cent in the same period.

The HIPC-initiative raises the question of whether the large debt reductions risk giving rise to fungibility. Even though debt relief is not intended for imports it can affect this variable indirectly through its effects on other balance-of-payment items. We saw above that

[15] Countries with large incomes from resource extracting industries often use the method of buying foreign denominated assets in order to avoid an appreciation of the real exchange rate.

fungibility could be expected if the debt were paid anyway and/or if the debt relief was expected to generate private capital flows.

The magnitude of the Mozambican debt in combination with the low production level of the economy makes it highly improbable that the country would have been able to pay its entire debt, or even a larger part of it, in the case of no debt relief. Therefore, it is very probable that the resources set aside for debt services, and which now can be used for other purposes, are limited. Thus, we do not expect fungibility to arise due to the fact that the debt relief frees resources.

Then, can the debt relief be expected to generate any inflow of private capital? The large debt relief implied by the HIPC initiative will quite likely have a positive effect on private capital flows since it significantly improves Mozambique's overall debt situation. It should be pointed out that the fungibility implied by these inflows is highly desirable for a country like Mozambique, which is in great need of foreign investments. The possible appreciative effects on the exchange rate of these inflows probably will be more than counteracted by the productivity-increasing effects of the investments, in particular since most of them probably are directed to the export sector (see also section about mega projects).

Productivity increasing aid

Which areas should aid be directed to in order to minimise Dutch Disease effects? Since Dutch Disease is a result of price increases, aid forms that contribute to a downward pressure on inflation are preferable. Examples of such aid forms are productivity increasing aid and aid that contributes to removing bottlenecks. In Mozambique there are, in particular, three areas where aid can be expected to have this effect: human capital, new technology and infrastructure.

Human capital

Besides the human aspects, investments in education and health are important for economic development. Research has shown the importance of human capital in achieving sustainable growth. However, since education is a public good the market tends to underprovide it. Therefore, one of the most important purposes of government is to provide appropriate

conditions for the generation of human capital, i.e., to create and supply schools and other educational institutions.

Mozambique ranks among the ten lowest in the UNDP human development index (HDI). The state of the education and health systems reflects the fact that Mozambique is one of the poorest nations in the world, with a life expectancy at birth of 46 years (UNDP 1998). In 1990-96 only 37 per cent of the total population had access to safe water and 46 per cent to sanitation. The illiteracy rates for men and women were 42 per cent and 77 per cent respectively in 1995 (UNDP 1998). There is a lack of school buildings, teachers, and educational materials, suggesting that many children do not get the education they are entitled to. In 1995 the combined first, second and third level gross enrolment ratios for girls and boys were 20.5 per cent and 29 per cent respectively. The corresponding figures for 'all developing countries' and 'least developed countries' were 53 and 31 per cent respectively for girls, and 59 and 40 per cent respectively for boys (UNDP 1998). Similarly, the supply of doctors, nurses, and medical centres and equipment is far from adequate.

Absolute expenditure on education and health increased considerably during the period 1987-97, which reflects a commitment of both the Government and the donor community to improve the socio-economic situation. In its Economic and Social Programme (PES) the Government has announced that expenditure on the social sector, including education and health, will increase. The Government has also declared that the debt relief of the HIPC initiative will be used for basic social services.

Although investment in human capital is made in Mozambique, it is insufficient for the immense needs of the country. It would be desirable to increase expenditure in this sector in order to generate the human capital required for the future growth of the country.

New technology

New technology makes it possible to increase productivity and can be achieved through research and development. However, the costs of investing in research and development are high, and investments take a long time to materialise. Rather than expensive investment in research and development, a better method for developing countries is to acquire new technology through technology transfer from developed countries. The sources through which

developing countries can obtain technology are primarily foreign aid in the form of technical assistance, and direct investment. Since most of Mozambican agricultural and non-agricultural production is low-tech, there is obvious potential for technology transfer. It is estimated that 95 per cent of the rural poor and 75 per cent of the urban poor are employed in low-productive agriculture. Outdated equipment, the use of low quality grain, and lack of fertilisers and artificial irrigation together explain the low productivity in agriculture. The harvests of most agricultural products are much lower in Mozambique than in other sub-Saharan countries (Ministry of Planning and Finance 1999).[16]

Infrastructure and communication

The poor state of infrastructure and communication is a major source of bottlenecks in the Mozambican economy, contributing to high transportation costs and thereby also to an upward pressure on prices. For example, the restriction on transport by the bad and insufficient road system results in insufficient supply and high prices of goods in areas outside the major cities. Consequently, aid channelled to the roads should have a downward pressure on prices.

But it is not only the roads that need to be improved. Improvement of water purifying plants and the system of water mains can, besides its positive social consequences, also be expected to have a positive effect on productivity and prices. Another example is the positive effects from the electrification of Mozambique. Providing remote areas of the country with power improves the conditions for both living and production significantly. The power supply makes it more attractive to localise production in these regions, which means that products that earlier had to be transported at large costs can now be produced locally.

A project, likely to have such positive effects on the regional economic development, is the ongoing rural electrification in the Quelimane and Tete provinces in the Central Region. The objective of the project is to improve conditions for local infrastructure and new industries through providing electricity to about 1,300 new households, 35 industrial enterprises and a number of commercial consumers in the Morrumbala, Mopeia, and Mutarara areas (EDM 1999).

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[16] The Mozambican harvests of maize, rice, cassava and beans are estimated to be 40 per cent, 25 per cent, 20 per cent, and 25 per cent respectively of the sub-Saharan averages (Ministry of Planning and Finance 1999).

Other capital inflows – investments in mega projects

In the sections about debt relieves and new technology we commented on the desirability of private investments in Mozambique. Until now foreign aid has been the primary source of capital inflows, but foreign investment in Mozambique is increasing. In particular, high expectations are bound up around the so-called mega projects. As yet, only the US$1.2 billion aluminium smelter, Mozal, has been launched. Other projects still in the pipeline include Maputo steel and Pande gas, the reduction of iron ore from South Africa, new investment at Cahora Bassa, and the restoration of the Moatize coal mine.

Once again, it should be stressed that Mozambique is in great need of investments of which the mega projects promise to be an important source. In this section, however, we shall comment on a potential problem with these projects. The large investments that the mega projects imply will give rise to large capital inflows, which in combination with the small Mozambican economy probably will have an appreciative effect on the real exchange rate. This loss in competitiveness risks giving rise to effects of the Dutch Disease type.

How large is then the risk that the mega projects will give rise to Dutch Disease? The projects are still in their infancy and it is still too early to evaluate their consequences. However, it is doubtful whether the net capital inflow of the mega project will be very large. During the construction phase, the mega projects give rise to a net inflow of capital in order to finance investments. However, according to the central bank the net effect on the balance-of-payment for the Mozal project so far is zero, in spite of promised positive capital inflows. During the production phase it is uncertain whether there will be any positive capital net inflow at all. The reason is that most of the intermediate products have to be imported, which will create counteracting capital outflows. If the incoming and outgoing capital flows more or less balance each other, the effect on the real exchange rate will only be marginal.

Even if it turns out that the capital flows associated with the mega projects appreciate the real exchange rate, it is important to weigh positive and negative effects against each other. As long as the mega projects are integrated with the surrounding economy and give rise to the expected spin-off effects, the productivity increasing effects of the projects probably have a positive effect on competitiveness that is larger than the effects of the capital flows. It is only

if the mega projects are not successfully integrated with the rest of the economy, i.e. if they become isolated high-technological industrial enclaves, that there is a risk that the rest of the economy will be negatively affected by the loss in competitiveness.

Concluding remarks

This study has addressed the question of whether foreign aid to Mozambique has given rise to Dutch Disease. We have also analysed how different forms of aid differ in their propensity to give rise to Dutch Disease.

Our empirical analysis gives a mixed result with respect to the Dutch Disease effects of foreign aid. Even though no general pattern of economic development in support of the Dutch Disease theory can be detected, the development of several macroeconomic variables to some extent correspond with what can be expected from the Dutch Disease theory. Thus, our results provide some support for the hypothesis that foreign aid has affected prices, exchange rates, and to some extent the external sector in line with the Dutch Disease theory. Even so, our analysis does not provide much evidence that changes in the aid inflow are reflected in changes in the macroeconomic variables in the way suggested by the Dutch Disease theory.

However, even though the exchange rates do not reflect all fluctuations in the aid inflow, it should be beyond doubt that the aid inflow, which is more than twice the size of incomes from exports of goods, has resulted in the fact that Mozambique today has a more appreciated real exchange rate than it would have without foreign aid. Foreign aid has also contributed to the stability of the exchange rate. First, it creates a demand for the Metical. Second, through conditionality and by providing financial support, aid makes it possible for the government and the Bank of Mozambique to hold on to a tight economic policy. Third, continued aid serves as a signal to private investors that the Mozambican economy is on the right track.

When it comes to relative sector development, our analysis can not show any impact of aid as predicted by the Dutch Disease theory. However, aid can be suspected of strengthening the position of Maputo as the economic and political centre of Mozambique. This is a matter of concern since it adds to the existing development gap between Maputo and the rural areas.

The impact of aid on prices and exchange rates seems to have passed through only to a limited extent to the real variables of the economy. A probable reason is that the supply elasticity of changes in structural factors is larger than the supply elasticity of changes in price and exchange rates in determing output and export performance. Thus, the low development levels of human capital, infrastructure and communication constitute more important impediments to growth than the Dutch Disease effects. To the extent that foreign aid contributes to the removal of the many structural bottlenecks in the Mozambican economy, the positive effects of aid on growth probably outweigh its negative effects. In addition, by contributing to the removal of bottlenecks aid also contributes to a downward pressure on prices, which counteracts the inflationary Dutch Disease effects. The impression that Dutch Disease effects have affected the Mozambican economy only to a limited extent is strengthened by the high growth rate, low inflation and decreasing current account and budget deficits.

Furthermore, it is doubtful whether a situation without aid would really imply an increase in competitiveness. Even though the appreciative pressure on the exchange rate would decrease, this gain in competitiveness would probably be erased by increased imported inflation. In addition, without aid the obvious risk is that the government would finance its expenditure through inflationary means. The expected increase in inflation in combination with the disappearance of donors as 'lenders of last resort' would negatively affect private investments.

The limited Dutch Disease effects of aid to Mozambique imply that there is no reason to increase the tiedness of aid. The smaller Dutch Disease effects that more tied aid imply would not compensate for the negative effects in the form of lost ownership and strain on the government budget. In addition it has proved difficult to avoid Dutch Disease through tying aid. A better way for donors to secure influence over the use of aid is to attach conditionality. Conditionality has proved successful when it comes to macroeconomic goals. There is no reason to believe that an increased use of targets for socio-economic goals would not be equally efficient. In setting these targets it is important to balance the donors' demand for insight against the recipient's requirement of ownership. In principle it is desirable to keep the targets on a general level, since there is a risk that they will interfere with each other if they are too detailed. In addition, too detailed conditions would interfere with the ownership of the government.

To conclude, the positive effects of aid to Mozambique are larger than its negative effects in the form of Dutch Disease, and will probably be so for several years. Furthermore, since the Dutch Disease effects seem to be incidental, we also conclude that aid in the form of programme assistance, such as balance-of-payment and budget support, is preferable to more tied aid since it implies a higher degree of ownership of the government.

Finally, even though in the nearest future the Dutch Disease effects of aid probably will be limited in Mozambique, there is no guarantee that they will continue to be so. It is to be expected that the effects of aid on prices and exchange rate will be more important for economic performance in pace with the removal of structural bottlenecks. In order to avoid unwanted effects on competitiveness it is important to create and develop instruments for exchange rate management. One such method for forestalling Dutch Disease effects is to allow Mozambique to place aid temporarily in international reserves. The use of aid for international reserves also allows the country to accommodate changes in trade and capital flows and to cushion the impacts of economic shocks. If the aid inflow continues to be large, there will also be reason to make a new study of the Dutch Disease effects in a few year's time.

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Appendix 1

Table A.1 Government finances, 1993-98 (in billions of meticais)

	1993	1994	1995	1996	1997	1998
Total revenue	1093	1526	2413	3479	4623	5311
Tax revenue	995	1397	2202	3193	4235	4946
Taxes on income and profits	157	273	400	633	879	951
Taxes on goods and services	535	739	1153	1727	2389	2366
Taxes on international trade	279	343	579	693	812	951
Other taxes	25	42	70	140	155	178
Non-tax revenue	98	129	211	286	388	365
Total expenditure and net lending	2305	407	5157	6773	9498	10207
Current expenditure	116	1978	2188	3077	4272	5268
Current balance	-74	-452	225	402	351	43
Capital expenditure	1097	2119	2863	3669	4816	4641
Net lending	40	0	106	27	410	298
Overall balance before grants	-1212	-2571	-2744	-3294	-4736	-4923
Overall balance after grants	-280	-714	-654	-1003	-1031	-1105
External borrowing (net)	204	788	816	1377	2329	2172
Domestic financing	76	-74	-162	-374	-1298	-1067

Source: IMF 1998, 1999

Table A.2 Gross output 1993-97 (in billions of meticais)

	1993	1994	1995	1996	1997
Agriculture and livestock	2125	3127	5018	8043	8918
Industry and fishing	1250	1903	3395	5335	6048
Construction	849	1484	2405	3437	3807
Transport and communications	1157	1621	2454	3133	3837
Services	2671	4370	6411	9330	11237
Wholesale and retail trade	583	948	1486	2081	2324
Restaurants and hotels	244	391	563	1012	1109
Production services	743	1345	2191	3219	3733
Government services	915	1340	1657	2318	3281
Domestic services	186	346	514	702	791
Gross output	8051	12505	19685	29279	33847

Source: IMF 1998

Table A.3 Balance-of-payments, 1993-98 (in millions of US dollars, unless otherwise specified)

	1993	1994	1995	1996	1997	1998[a]
Trade balance	-697,9	-717	-552,7	-556,5	-530	-620,1
Exports (f.o.b.)	131,8	164	174,3	226,1	230	248,2
Imports (c.i.f.)	-829,7	-881	-727	-782,6	-760	-868,3
Services (net)	-126,6	-147,3	-124,1	-85,3	-80,3	-185,9
Current account (excluding grants)	-824,5	-864,3	-676,8	-641,7	-610,3	-806,0
Unrequited official transfers	503,3	564,6	339,2	282,9	312,9	313,2
Current account (including grants)	-321,2	-299,7	-337,6	-358,8	-297,4	-492,8
Capital account	-107	-9,7	63,8	238,6	182,5	256,0
Short-term capital and errors and omissions (net)	-8	11,3	23,2	57,7	23,9	22,7
Overall balance	-436,2	-298	-250,6	-62,5	-90,9	-214,1
Financing	436,2	298	250,6	62,5	90,9	214,1
Net foreign assets	46	-52,4	-59,6	-159,3	-148,1	-77,2
Net change in arrears (increase +)	177,8	147,3	189,4	-64,5	-3935,2	24,2
Financing gap	212,2	203,2	120,9	286,3	4174,3	267,1
Debt relief	212,2	203,2	120,9	286,3	4174,3	267,1

Note: a) estimates

Source: IMF 1998, 1999

Table A.4 Monetary Survey, stocks, 1993-97 (in billions of meticais)

	1993	1994	1995	1996	1997
Net foreign assets	709	1147	2486	4501	6269
Net domestic assets	1310	2033	2434	1458	1200
Credit to the government, net	39	-87	-320	-748	-1347
Credit to the economy	1095	1711	2536	3565	5209
Money and quasi money (M2)	2019	3181	4920	5958	7469
Money	1796	2895	4493	5237	6208

Source: IMF 1998

Table A.5 Monetary Survey, flows, 1993-97 (in billions of meticais)

	1993	1994	1995	1996	1997
Net foreign assets	-75	289	485	2102	1701
Net domestic assets	786	728	731	-1105	-187
Credit to the government, net	79	-74	-137	-433	-605
Credit to the economy	197	616	825	1103	1697
Adjusted M2 flow	711	1017	1217	997	1515
Change in M2 stock	889	1162	1739	1038	1511

Source: IMF 1998

Table A.6 Bilateral ODA commitments:by purpose (per cent)

	1993	*1994*	*1995*	*1996*	*1997*
Social infrastructure and services	20,6	42,3	18,3	30,2	26,5
Economic infrastructure and services	11,1	9,3	12,7	6,0	13,4
Production sectors	16,0	13,4	10,4	21,7	4,3
Multisector	12,7	5,8	9,0	8,8	9,3
Programme assistance	21,9	8,8	20,7	21,0	11,1
Action relating to debt	6,0	14,4	18,6	8,5	32,3
Emergency assistance	11,4	5,7	9,9	1,9	2,0
Unallocated unspecified	0,4	0,2	0,4	2,0	1,2
Total	100,0	100,0	100,0	100,0	100,0

Source OECD 1998

Appendix 2

The real exchange rate

The real exchange rate (RER) is an essential variable for the Dutch Disease theory. It is through this variable that foreign aid affects international competitiveness and sectors of the recipient country. In this appendix we will discuss the underlying determinants of the real exchange rate.

The real exchange rate (RER) determines a country's competitiveness versus its trading partners. The real exchange rate can be defined in several ways (see, for example, Fleissig and Grennes 1994). One of the most frequently used definitions of the real exchange rate (RER) is the purchasing power parity definition. The absolute version of the purchasing power parity states that the real exchange rate equals the ratio of foreign prices expressed in the currency of the home country over the prices of the home country.

$$RER = NER * P_F / P_D$$

where RER is the real exchange rate, NER is the nominal exchange rate, P_D and P_F are price indexes in the home and foreign countries respectively.

From its definition it follows that changes in the real exchange rate are functions of underlying changes both in the nominal exchange rate and in the prices of goods and services (domestic and foreign). An analysis of the effects of foreign aid on the real exchange rate and thereby also on the competitiveness of the aid-recipient country thus requires the study of the impact of aid on these variables.

The nominal exchange rate shows how much of the domestic currency is needed to buy foreign currencies. The nominal exchange rate is said to appreciate if this amount decreases and to depreciate if the amount increases. A country for which the nominal exchange rate appreciates incurs a loss in competitiveness, *ceteris paribus*, since foreigners that wish to buy

its products have to pay more in their own currency than before the appreciation. Thus the products of the country with an appreciating currency become more expensive for foreigners.[17] Following the same line of reasoning, a depreciation of the nominal exchange rate results in a gain in competitiveness.

The competitiveness of a country also depends on the relative rate of changes of domestic and foreign prices. If domestic prices increase at a higher rate than foreign prices, competitiveness will decrease since domestic products will become relatively more expensive than foreign products. On the other hand, if domestic prices increase at a lower rate than foreign prices, competitiveness instead will improve.

How is then the real exchange rate affected by changes in the nominal exchange rate and in prices? The nominal exchange rate and the real exchange rate tend to change in the same direction, *ceteris paribus*; for example, if the nominal exchange rate appreciates, the real exchange rate also tends to appreciate. Domestic prices that increase relatively more than foreign prices also have an appreciative effect on the real exchange rate. Thus, an appreciation of the real exchange rate can be caused either by an appreciation of the nominal exchange rate or by domestic prices that increase relatively more than foreign prices, or by a combination of the two. By implication it also follows that an appreciation of the real exchange rate results in a loss of competitiveness.[18]

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[17] For example, the nominal exchange rate of the Metical versus the US dollar shows how many Meticais are needed to buy one US dollar. At present the nominal exchange rate is around 12,500 Metical per US dollar. If the price of 1 US dollar increases from 12,500 to 13,000 Metical there is a depreciation and if it decreases from 12,500 to 12,000 there is an appreciation of the Metical. If a foreign importer of Mozambican goods after an appreciation only gets 12,000 Metical per US dollar while he earlier got 12,500, it implies that he now has to provide a larger amount of dollars to get the same amount of Metical. Consequently, Mozambican goods have become more expensive for the importer.

[18] Similarly, a depreciation of the nominal exchange rate and domestic prices that increase at a lower rate than foreign prices have a depreciative effect on the real exchange rate. A depreciation of the real exchange rate implies an improvement in competitiveness.

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