EMIGRANTS' REMITTANCES AND DUTCH DISEASE

IN CAPE VERDE

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Abstract: Emigrants' remittances have increased rapidly over the past two decades. While earlier studies have focused on their microeconomic effect on incomes and poverty in recipient countries, the present study concentrates on the macroeconomic impact of remittances on the real exchange rate in Cape Verde. A main conclusion is that remittances give rise to a sort of Dutch Disease effect and thereby have an adverse effect on the competitiveness of the tradable sector. The magnitude of this effect in Cape Verde is not that large, however. The changing orientation of official aid to more growth-oriented aid, combined with a more export-oriented domestic policy, has contributed to limiting the adverse impact of emigrants' remittances on the competitiveness of the Cape Verdean economy.

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1. Introduction

With limited natural resources and human and capital endowments, Cape Verde is highly dependent upon external assistance for its well being. External assistance to the country has oscillated between 30 and 60 per cent of GDP during the past three decades. Indeed, official development assistance was the dominating source of capital inflow in the years following independence from Portugal in 1975. The relative importance of emigrants' remittances has increased markedly since the early 1980s, however, and they constitute today the dominating source of external capital inflows. At present the shares of recorded remittances and official aid each amount to about 15 per cent of GDP. Cape Verde, with its small economy and large dependency on capital inflows, can be regarded as an extreme case. However, it is possible to generalise the analysis to other developing countries because many African countries are facing - or on the way to facing - a similar situation, albeit less pronounced, of diminishing aid inflows and increasing emigrants' remittances. The flows of emigrants to the 'rich world' are growing steadily, because of the dismal growth performance of many developing countries, in particular in Sub-Saharan Africa, and of the need for migrant families to diversify income sources and risks.

The purpose of the present study is to analyse the impact of emigrants' remittances on the competitiveness of the economy of Cape Verde. Unlike previous studies that concentrated on the microeconomic effects of remittances, the present study focuses on macroeconomic issues. The effects of the large capital inflows are analysed within the Dutch Disease theoretical framework. The Dutch Disease theory suggests that the effects of capital inflows on resource allocation are traced through their effects on the real exchange rate. More precisely, it tells us that large inflows of capital can give rise to an appreciation of the real exchange rate and eventually a deterioration of the competitiveness of the sectors exposed to international

competition, thus preventing the development of a dynamic export sector. To our knowledge no other study has focused on the impact of remittances on the real exchange rate.

The paper is structured as follows. The second section describes changes in the volume and composition of capital inflows after independence from Portugal in 1975, with the emphasis on emigrants' remittances. The third section presents the Dutch Disease theory, illustrating the various channels through which capital inflows influence the recipient economy. The fourth section provides an econometric test of the impact of capital inflows, in particular emigrants' remittances, on the real exchange rate in Cape Verde. The final section summarises the main points of the paper and discusses a plausible way to lessen the adverse effects of capital inflows on competitiveness.

2. The Rise of Emigrants' Remittances

Historically, external assistance to Cape Verde has taken two forms, official development aid and private remittances from emigrants. The two forms are interrelated in various ways. For example, increased official aid in the form of food aid programmes diminishes the need for (and presumably the volume of) private remittances. By the same token, more growth-oriented official aid in the form of investment in human capital or economic infrastructure is likely to lead to higher per capita incomes and thereby to less need for private assistance. The relation between official aid and remittances can go the other way as well. For example, increased emigrants' remittances to Cape Verde have an upward effect on per capita income, which in turn can result in decreased official aid because of the role of average per capita income in the donor countries' decision to grant assistance and, if so, to what amount.

Remittances from emigrant workers and members of the Cape Verdean Diaspora across the globe constitute a growing share of external assistance to Cape Verde. The Diaspora comprises the successive waves of emigrants and their descendants throughout history. It is estimated at some 450,000 people, that is, more than the

current resident population in Cape Verde, which was estimated by the Population Census to be some 435,000 in 2000.[1] Around 60 percent are living in the United States, some 25 percent in Western Europe and the rest in coastal Africa, mainly in Angola and Senegal. The history of emigration from Cape Verde is intimately related to the history of the country. In particular, the recurring droughts and the spectre of famine have made Cape Verdeans a nation of emigrants. Even today, more than half of the population wants to emigrate, though the figure varies somewhat across islands and over time. The large size of the Cape Verdean overseas Diaspora, combined with a relatively strong motivation to remit, explains the considerable volume of remittances when related to the size of the country. In the late 1990s remittances provided three times more foreign exchange than merchandise exports (re-export of fuel included) and two and a half times more than tourism revenues.[2]

Figure 1 portrays the magnitude of remittances and their evolution over time after independence. It makes use of official statistics on private transfers, collected by the central bank (*Banco de Cabo Verde*) and recorded in the balance of payments. Private transfer statistics are believed to more accurately capture the volume of remittances than the data reported under the heading "workers' remittances" alone.[3] Nonetheless the official statistics on private transfers probably underestimate the real stream of remittances because they do not include the substantial amounts that are carried back on holidays in, and visits to Cape Verde, or those via various under-ground channels most often changed in parallel markets.[4] The definition of remittances was changed in 1981, which means that any comparison of the levels in the periods before and after 1981 should be interpreted with caution. Bearing in mind these

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[1] A higher figure is provided by Jørgen Carling who estimates the Cape Verdean Diaspora at 510,000 (Carling (2001), p. 7).

[2] According to the last household survey conducted in Cape Verde (in the late 1980s), between 60 and 70 percent of the families benefit from remittances from abroad (see Banque Mondiale (1994), pp. 3-4). A new household survey is currently being undertaken, which should provide an update on the role of remittances in household incomes. The results of the survey will not be available before late 2003.

[3] World Bank (2003), Annexe: Sources of remittance data, pp. 171-172. See also the discussion in Gammeltoft (2002), pp. 191-194.

[4] Private transfers through informal channels in developing countries are believed to range from 10 to 50 percent of total remittances (World Bank (2003), p. 171). An indication of the large amount of funds transiting outside official channels in Cape Verde is the negligible premium for foreign exchange charged by informal street traders in Praia in spite of the, from time to time, large number of

limitations, Figure 1 provides evidence of a sharp decrease in remittances (in % of GDP) until the mid-1980s. Thereafter we notice a significant increase, interrupted in 1997. The rapid increase in current and real remittances in the late 1980s and early 1990s is mirrored in the remittance-GDP ratio jumping from around 13 percent in the mid-1980s to some 20 percent in the mid-1990s. Figure 1 also portrays the evolution of official development assistance. It shows a considerable fall after 1985, dropping from 65 to 13 percent of GDP between 1985 and 2001. Today the magnitude of remittances is slightly larger than that of official assistance.

Figure 1: Emigrants' Remittances and official development assistance, 1977-2001.
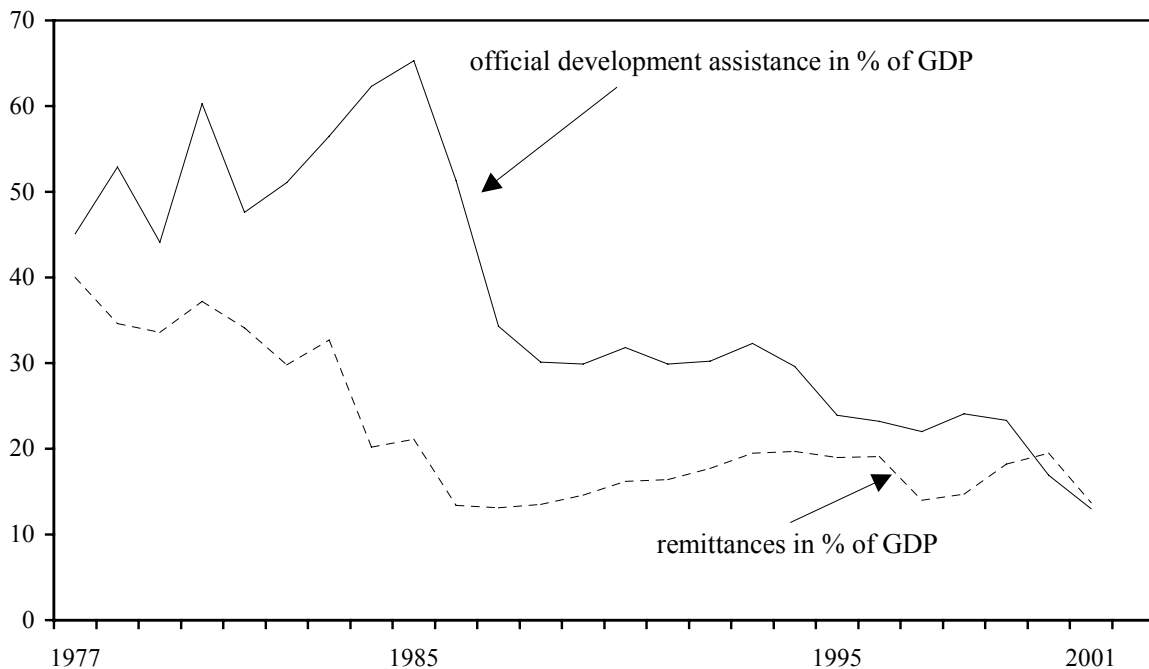
Sources of data: World Bank Africa Database (2003) and OECD (2001) International Development Statistics for the year 1985.

Motivations to remit

A better knowledge of the motivations to remit is important in order to understand the economic impact of remittances because the motivations influence the way remittances are used and invested. Several motives to remit are put forward in the economic literature, the two most extreme being altruism and self-interest.[5] The

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applications for (i.e. shortage of) foreign currencies in the formal banking system. On this, see Olters (1999).
[5] See Stark (1995), pp. 4-6 and 89-105, and Stark (1993), pp. 236-254.

former refers to the care of emigrants for relatives left behind in the country of origin, whereas the latter refers to selfish motives with remittances regarded as a form of investment in the quest for future returns. The latter is broadly defined to include investments in various assets (house, land, etc.) as well as remittances aimed at securing inheritance. It can also be the case that the motive to remit has both altruistic and selfish dimensions. This is suggested by Oded Stark, who labels this motive "tempered altruism" or "enlightened self-interest".[6] Whatever the motive, the income of the remitters is crucial for the magnitude of remittances and the higher his/her income the larger the stream of remittances is likely to be. But the income of the recipient of remittances, and shortfalls in it, will also be central to the volume of remittances when pure altruism is the motive to remit: the lower the income of the recipient the larger the volume of remittances. On the other hand, and particularly for remittances motivated by self-interest, the return on investments in the country of origin of the migrant, and the difference between this return and the return in the country of emigration, will be decisive for the magnitude of remittances.

The volume of remittances to Cape Verde has increased markedly since 1985, parallel with a tremendous increase in per capita income (which increased threefold in real terms between 1985 and 2001). This finding is apparently in conflict with purely altruistic motivations for remittances. The distribution of remittances among source countries shows that the West-European countries and the United States dominate with about 60 percent and 30 percent of total remittances, respectively. The share of the United States in total remittances is lower than its share in the Cape Verdean Diaspora (some 60 percent). Among other things, this reflects the fact that the members of the Diaspora in the United States are often fourth or fifth generation and that identification and social allegiance tend to fade away over time. Three West-European countries, Portugal, Holland, and France, account for about half of total remittances to Cape Verde, while they only account for a mere 20 percent of the Diaspora. Besides, Portugal accounts for a share of total remittances that is clearly lower than its share of Cape Verdean residents in Western Europe, reflecting lower per capita incomes in this country. The evidence thus confirms that the level of real income in the source

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[6] Stark (1993), pp. 239-240.

country, in interaction with the lapse of time after emigration, has an important influence on the scale of remittances.[7]

The large increase in remittances after 1985 was also the result of more favourable returns provided to emigrants' savings in Cape Verde. Nominal interest rates for deposits were kept constant at 6.5 percent between independence and 1985. With relatively high inflation in the early 1980s this meant that real interest rates (interest rates minus inflation) were even clearly negative during the first half of the 1980s. During this period, emigrants' remittances seem, therefore, to have been motivated by altruistic rather than selfish motives. On the other hand, increases in interest rates after 1985 (in both nominal and real terms) and the creation of special deposit accounts for emigrants' remittances contributed greatly to the rise of remittances after the mid-1980s.[8] About one third of total emigrants' remittances are placed in such deposit accounts, which benefit from higher deposit rates.[9] Other factors that contributed to increasing the stream of remittances were the relatively strict monetary policy, and the fixed exchange rate regime adopted by Cape Verde after 1982, that has helped to limit exchange rate risks. Therefore the considerable increase in remittances after the mid-1980s should, to a large extent, be ascribed to self-interest.[10]

A conclusion that emerges from the above reasoning is that remittances to Cape Verde are mainly driven by self-interest, but that altruistic reasons are not totally absent, as indicated by the non-negligible stream of remittances in the early 1980s.

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[7] A factor that can have influenced the rise in remittances over time is the feminisation of emigration and the fact that women usually remit a larger proportion of their earnings. On the other hand, women's wages are generally lower, which might outweigh the positive impact of feminisation on the volume of remittances.

[8] IMF (1996), pp. 84-85.

[9] The differentials between the residents' and emigrants' deposit rates have fluctuated over time, ranging from about 1 percentage point for more than one year deposits to around 3 percentage points for shorter-term deposits.

[10] IMF performed an econometric study of the determinants of emigrants' remittances in Cape Verde between the late 1970s and 1995. The study shows that income disparities between Cape Verde and source countries, the introduction of special deposit accounts, and exchange rate anticipations had a significant impact on the stream of remittances. On the other hand, the study shows that the real interest-rate differential did not affect the stream of remittances. A reason for the latter result may be that the dummy variable that captures the impact of the special deposit accounts on remittances also captures the impact of higher interest rate policies in Cape Verde on remittances. The study also shows a highly significant intercept that can be interpreted as a parameter reflecting altruism, constant across countries and over time. IMF (1996), pp. 84-97.

Emigrants' remittances are highly responsive to the return on savings in Cape Verde and to the levels of income in the source countries. They can therefore be regarded as being the expression of "enlightened self-interest". An implication of this is that the magnitude of remittances is unlikely to decrease in the future even in case of increases in per capita income in Cape Verde and thus less need for private assistance. Remittances will continue to grow provided that the favourable financial returns granted to emigrants are maintained, and that the real incomes of Cape Verdean emigrants in Western Europe and the United States continue to grow.

3. Emigrants' Remittances and Dutch Disease

Emigrants' remittances correspond to a capital inflow, which is similar to that analysed by the Dutch Disease theory. The main concern of this theory is to assess the effects of a capital inflow on the real exchange rate and the country's international competitiveness.[11] The real exchange rate (RER) is defined as the *domestic* relative price of tradables (T) to non-tradables (N): $RER = P_T / P_N$. A fall in RER implies a real exchange rate appreciation and an increase in the opportunity cost for producing tradables. This is synonymous with a deterioration of the country's competitiveness under the assumption of unchanged relative prices in the economies of the trading partners. Conversely, an increase in RER will result in real exchange rate depreciation and an improved international competitiveness.

The origin of the capital inflow in this study, remittances, or a discovery of new resources in the Dutch Disease theory, means that the effects of capital inflow on the real exchange rate and resource allocation differ to some extent. An increase in emigrants' remittances gives rise to a *spending effect*. The spending effect is a function of the increase in disposable income following the remittance inflow. Assuming positive income elasticity, the change in income gives rise to increased spending and demand in the economy. As the supply of the non-tradables is limited by the available resources of the country, there will be an excess demand that will push the price of non-tradables upwards, and, since the prices of tradables are determined in the world

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[11] Corden and Neary (1982).

market, lead to an appreciation of the real exchange rate. As a result of the increase in remittances there will be a *resource movement effect*. The increase in the price of non-tradables increases the compensation to the production factors in this sector in relation to other sectors and encourages a move of mobile production factors from the tradable sectors to the non-tradable sector. This process is expected to continue until the factor compensation is once again the same in all sectors. Public policy can accelerate this process by encouraging the mobility of production factors between the sectors.

The appreciation of the real exchange rate and the deterioration of the country's competitiveness are likely to be less important in the longer-term than in the short term due to a long-term mechanism that works in the opposite direction of the spending effect. An increase in emigrants' remittances boosts capital accumulation through its effect on domestic saving and investment. This applies in particular when the motive to remit is self-interest (see above). For example, an increase in remittances that is ascribed to the more favourable returns provided for emigrants' savings in the form of special, better-remunerated deposit accounts contributes to factor accumulation, deposits being eventually transformed by the banking system into investments. On the other hand, remittances motivated by altruism, that is the care of emigrants for relatives left behind in the country of origin, are more likely to be used for consumption and thus less likely to contribute to saving and investment. In the longer-term, capital accumulation growth will increase the production of both tradables and non-tradables. The relative increase in the production of tradables and non-tradables is likely to vary from country to country and depend upon factors like the structure of the economy, the multiplier effect, domestic preferences or the impact of foreign aid. In the case of Cape Verde, capital accumulation in accordance with the Rybczynski theorem is likely to increase the production of the capital intensive non-tradable sector more than that of tradables. This assumption is supported by the fact that more than half of the credits is granted by the banking system to individuals, mostly for residential construction. Factor accumulation induced by remittance inflows will affect *ceteris paribus* the prices of non-tradables in terms of tradables. A priori it is difficult to say in which direction, even if in the case of Cape Verde we may suspect a downward effect on the relative price of non-tradables. This effect can be expected to

be further strengthened to the extent that foreign aid contributes to the removal of price-increasing infrastructural bottlenecks.

Figure 2: Effect of remittances on output composition and relative prices
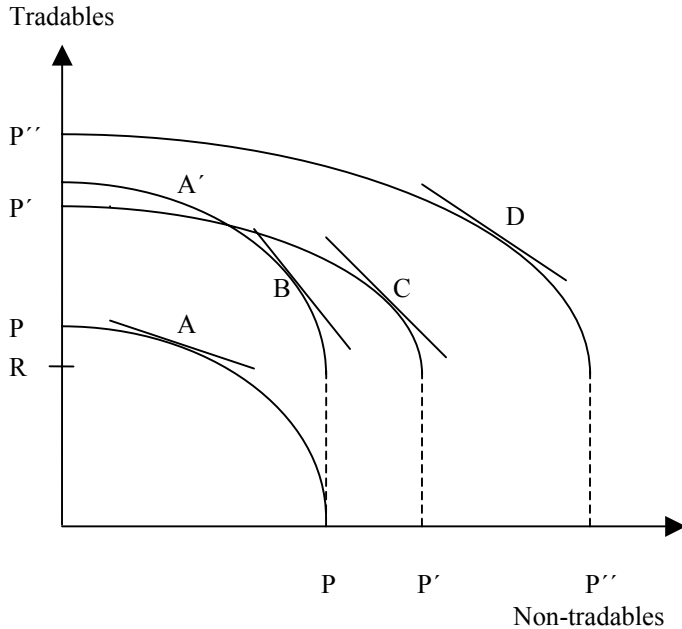
The impact of remittance inflows on output and the real exchange rate is illustrated in Figure 2. Non-tradables are shown along the horizontal axis and tradables along the vertical axis. The transformation curve of the economy is given by the curve PP. The initial equilibrium in the economy is given by point A where the slope of this curve is assumed to be equal to the slope of the highest attainable social indifference curve. The relative price of non-tradables is accordingly determined by the tangential at this point. The impact of the inflow of remittances (R) on consumption possibilities is illustrated by displacing the transformation curve upwards since the availability of tradables in the economy increases. Remittances are assumed to be constant over time. With an unchanged price of non-tradables, the tangential of the relative price line with the transformation curve would be vertically above the initial point A at A´. The bundle of goods demanded at this price is given by a point to the right of A´, where the income-consumption curve (not drawn in Figure 2) intersects with the price line. Accordingly, there is an excess demand for non-tradables equal to the horizontal distance between these two points. The price of non-tradables has to rise to clear the

market. Subsequently the production of non-tradables increases and the demand decreases. The new equilibrium in the short term will be on the transformation curve somewhere between point A′ and the intersection of the transformation and income-consumption curves, such as point B. Compared to the initial situation, the result of the spending effect will be an increase in the production of non-tradables and a decrease in that of tradables.

The relative price increase of non-tradables can be expected to overshoot in the short-term. In the longer term all production factors will adapt to the changed conditions implying a new transformation curve P′P′, which will be relatively more biased towards the production of non-tradables. As a consequence the relative price of non-tradables can be expected to fall in comparison with the initial effect. The tangential of the price line and the transformation curve will be found at point C. Considering also the role of capital accumulation, the transformation frontier will shift further outwards to P′′P′′. If investments are to be directed towards the production of non-tradables (as in the case of Cape Verde), over time we can expect that the relative price of non-tradables will fall even further (in comparison with the initial effect) implying a tangential with the transformation curve such as at point D.

The initial spending effect of emigrants' remittances can thus be said to impoverish the tradable sectors through real exchange rate appreciation. The appreciation of the real exchange rate implies a deterioration of the tradable sectors' competitiveness, and reduced exports, domestic market shares and production. The longer-term effect of remittances on the real exchange rate and competitiveness is, however, likely to be less important because of capital mobility and factor accumulation.

4. Remittances and Real Exchange Rates

Let us now turn to the econometric analysis of the role of remittances in the real exchange rate (*RER*) in Cape Verde. First we define the concept of equilibrium real exchange rate and discuss the variables that are usually believed to determine the level of and changes in the real exchange rate. Then, we perform an econometric test of the

determinants of the real exchange rate in Cape Verde, with emphasis on the role of emigrants' remittances and official foreign assistance.

The equilibrium real exchange rate is defined as the relative price of tradables to non-tradables that results in the simultaneous attainment of internal and external equilibrium.[12] Internal equilibrium here implies that the non-tradable goods market clears in the present period and is expected to clear in future periods. External equilibrium implies that present and future current account balances are compatible with long-term, sustainable capital flows. Both the internal and external equilibrium are determined given long-term equilibrium values of the so-called fundamentals, i.e., real variables such as capital flows, terms of trade, economic growth, etc. By determining internal and external equilibrium the fundamentals, by definition, also determine the equilibrium real exchange rate. There is no given equilibrium real exchange rate that remains constant: if the determinants of the equilibrium real exchange rate change, i.e., if there are changes in one or several fundamentals (for example, if there is a permanent change in the foreign aid inflow), the value of the equilibrium real exchange rate also changes. To use the words of Edwards (1988:5) "...there is not one single equilibrium real exchange rate. Rather, there is a path of equilibrium real exchange rate indexes through time."

The equilibrium real exchange rate can be expressed as a function of different explanatory variables, i.e.,

$$RER_t = \gamma(F_t) + v_t$$

where F_t is a vector of different explanatory variables.

Determinants of the real exchange rate

A common feature of most models for the determination of the real exchange rate is that they use variables that check for the impact on the real exchange rate of capital flows, government expenditures, technological progress and/or capital growth, trade restrictions and changes in international relative prices.[13] Examples of proxies used for

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[12] Edwards (1988) p. 5, and (1989), p.16.
[13] See e.g. Edwards (1989), Aron *et al* (2000), and MacDonald and Ricci (2003).

these explanatory variables are international transfers (including remittances), foreign aid, international terms-of-trade, world real interest rates, import tariffs and quotas, export taxes, other taxes and subsidies, the composition of government expenditure and GDP growth, fiscal balances and credit creation. We will now investigate further the explanatory variables used and considered to be the most important in our estimation of the Cape Verdean real exchange rate, singling out the impact of remittances, and analyse how they can affect the real exchange rate. (Table 1 provides the list of the determinants with their expected impact.)

Table 1: Determinants of the real exchange rate

Variable	Definition	Expected sign
RER_t	Real exchange rate.	
$REMIT_t$	Ratio of net private transfer to GDP.	(-)
ODA_t	Ratio of net ODA to GDP.	(-)
$INTREMODA_t$	Interaction term between private transfer and net ODA to GDP.	(?)
$REMODA_t$	Ratio of net private transfer and net ODA to GDP.	(-)
$GRANT_t$	Ratio of non-technical assistance to GDP.	(-)
$INTREMGRA_t$	Interaction term between private transfer and non-technical assistance to GDP.	(?)
$REMGRANT_t$	Ratio of net private transfer and non-technical assistance to GDP.	(-)
TOT_t	International terms of trade.	(-)
$EXPIMP_t$	Ratio of exports and imports to GDP.	(+)
$EXCRE_t$	Government policy proxied by the growth of excess domestic credit measured as rate of growth of domestic credit minus rate of growth of real GDP lagged one period.	(-)
$TREND_t$	Technological progress proxied by trend.	(-)

Note: A positive sign (+) implies that an increase in the variable is expected to give rise to a depreciation of the real exchange rate and a negative sign (-) implies that an increase in the variable is expected to give rise to an appreciation of the real exchange rate.

Starting with international transfers; this explanatory variable is likely to give rise to an appreciation of the real exchange rate and thereby also to Dutch Disease effects. Besides remittances, Cape Verde has been the recipient of large volume of official foreign aid. Over the period studied there was also a change in the composition of both remittances and aid. Remittances are measured by the ratio of private transfers

to GDP (*REMIT*). Official foreign aid inflows to Cape Verde are measured by net official development assistance to GDP (*ODA*), alternatively by non-technical assistance (*GRANT*). To check whether the effect of remittances depends on the level of the aid inflow, we create interaction terms between remittances and the two measures of aid (*INTREMODA* and *INTREMGRA*). Two aggregated variables of transfers are also constructed though summing remittances and official development assistance (*REMODA*) and remittances and non-technical assistance (*REMGRANT*).

Another habitual explanatory variable is international terms-of-trade (TOT). Changes in terms-of-trade affect the prices of non-tradables both through an income effect and a substitution effect. Analyses by Sebastian Edwards show that the income effect normally dominates.[14] In the case of improved terms-of-trade the income effect implies that more is spent on all products which in turn results in higher prices of non-tradables. Consequently, the outcome of the income effect is an appreciation of the real exchange rate.

An increase in trade restrictions causes the prices of tradables to increase, and that of non-tradables to decrease as a function of the income effect and to increase as a result of the substitution effect. The mechanism behind these processes is the same as that generated when the terms-of-trade deteriorate. However, in the case of an import tariff the income effect is less likely to dominate, which means that an increase in import tariffs results in an appreciation of the real exchange rate.[15] Similarly, it can be shown that trade liberalisation is likely to lead to a real depreciation. The openness of the economy is measured by the ratio of exports and imports to GDP (*EXPIMP*).

An excess supply of money or a fiscal deficit will induce an upward pressure on prices of non-tradables that will result in a real appreciation. The effect of government policy on the Cape Verdean real exchange rate will be measured by excess credit creation. This variable is measured as the rate of growth of domestic credit minus the rate of growth of real GDP lagged one period (*EXCRE*). Since part of the fiscal deficit has been financed through money creation, it is reasonable to believe that the impact of this deficit is captured to some extent by the variable for excess credit creation.

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[14] Edwards (1988), p. 7.
[15] Ibid.

Technological progress results on the one hand in a positive income effect, which through increased spending on non-tradables tends to appreciate the real exchange rate, while on the other hand it gives rise to a supply effect that tends to depreciate the real exchange rate. The net effect depends on the relative magnitude of the two effects. According to the Balassa-Samuelson effect, faster technological progress induces an appreciation of the exchange rate.[16] A trend variable is used as a proxy for capturing the impact of technological progress on the real exchange rate.

An econometric analysis of the Cape Verdean real exchange rate

A model for the determination of the Cape Verdean equilibrium real exchange rate can now be specified through the substitution of different explanatory variables for F in the equation for the equilibrium real exchange rate.[17] The reformulation yields

$$RER_t = \gamma(REMIT_t, ODA_t, INTREMODA_t, EXCRE_t, TOT_t, TREND_t) + v_t$$

In the estimations, presented in Table 2, alternative model formulations are also used in which $GRANT$ and $INTREMGRANT$ are substituted for ODA and $INTREMODA$ respectively, and the aggregated transfer variables $REMODA$ and $REMGRANT$ are substituted for $REMIT$ and ODA respectively. The variables are in logarithmic form. Data for estimation of the model were obtained from the Bank of Cape Verde, the IMF (*International Financial Statistics*) and from the World Bank (*World Bank Africa Database*). The model is estimated for the period 1980-2000. The small number of observations restricts the test methods that can be applied.

Augmented Dickey-Fuller (ADF) tests for stationarity are performed on the different time series. Plots of the first differences of the series indicate that neither drift nor trend is present in the data. Consequently, the Dickey-Fuller tests are performed without constant and trend. The limited number of observations implies that the results of the tests for higher order integration in particular can be questioned. Even so, the result provides an indication of the degree of non-stationarity in the data and therefore the test procedure described above was followed. To address the small sample bias, we

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[16] Balassa (1964) and Samuelson (1964).
[17] The estimations take account of the impact of trade barriers through the use of a real effective exchange rate index.

use a 1 per cent significance level instead of the conventional 5 per cent level. The first step is to test whether any of the series are integrated of order one. For all time series the null hypothesis of non-stationarity could not be rejected. Consequently, these series were tested for a higher order of integration. In all but the case of *REMODA* the null hypothesis of non-stationarity was rejected, which suggests that the series are integrated of order one.

Since the test does not reject the existence of non-stationary, standard asymptotic estimation methods are not appropriate. Instead multivariate Engle-Granger (1987) co-integration tests are performed in order to check for the long-term statistical relationship between the real exchange rate and the explanatory variables.[18] The co-integration tests are performed in two stages. In the first stage, the equation for the determination of the equilibrium real exchange rate is estimated by the use of OLS technique. In the second stage, an augmented Dickey-Fuller (ADF) test is performed on the residuals. The Blangiewicz and Charemza (1990) critical values for 20 observations and five variables are used. At the 5 per cent level, the ADF t-statistics, as shown by Table 2, are smaller than the critical value of -4.10 for all the estimated equations with the exceptions of equations 2 and 4. For these two equations the ADF t-statistics are, however, smaller than the critical value of -3.65 at the 10 per cent level. Therefore the hypothesis of co-integration cannot be rejected and the different model specification presented in the table can be said to capture the long-term relationship between the Cape Verdean real exchange rate and the explanatory variables.

The R^2 values are higher than 0.90 for all equations, with the exception of Equation 4. The *F*-value is highly significant in all equations. The Durbin-Watson-statistics show that the hypothesis of no auto-correlation cannot be rejected for any of the equations. This result is supported by a LM-test for AR(1) and AR(1-2). For all equations except for Equation 3 (AR(1-2)), the null hypothesis of no serial correlation cannot be rejected at the 10 per cent level. To test for the presence of heteroskedasticity, we use the ARCH-test (ARCH(1) and ARCH(1-2)). The null hypothesis of heteroskedasticity cannot be rejected at the 20 per cent level in any of

the estimations. A test for functional mis-specification is performed using the RESET test. In this test we cannot reject the null hypothesis of no functional mis-specification at the 5 per cent significance level for all estimations except for equation 2.

The equations are robust with respect to most explanatory variables and their estimated signs and sizes. The regressed variables show the signs that are expected from theory. Most of the variables are significant at the 5 per cent level or lower. The exceptions are *ODA* in Equation 1, *EXCRE* in Equations 3 and 4, and *GRANT*, *INTREMGRANT* and *EXPIMPGDP* in equation 6 which are all significant at the 10 per cent level, only. Also, *GRANT* in equation 3 and *INTREMODA* in equation 5 are only significant at higher statistical levels.[19]

The coefficient of remittances, both by itself (*REMIT*) and in combination with aid (*REMODA* and *REMGRANT*), shows the expected, negative sign in all equations. Furthermore, in Equations 1 and 2, the significance level of the variable lies below the 1 percent level. The estimated coefficients indicate the long-term elasticity of remittances. For example the coefficient of *REMIT* in Equation 1 indicates that a 10 per cent increase in remittances appreciates the real exchange rate by 1.2 per cent. Thus, the estimations support the view that emigrants' remittances to Cape Verde have had an appreciative effect on the real exchange rate.

Assessing the interactive impact of official aid and remittances

The coefficients of the interaction terms *INTREMODA* and *INTREMGRA* have positive signs and are of the same size (around 0.14). The inclusions of these variables have similar effects in equations 5 and 6. In both equations the absolute value of the coefficient of *REMIT* increases considerably to around -0.60 and that of aid (*ODA* and *GRANT*, respectively) increases as well to between -0.40 and -0.50. The coefficients of the rest of the variables are stable in comparison with their values in equations 1 to 4.

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[18] The model by Johansen-Juselius (1990) would have been more appropriate because several variables are assumed to determine the real exchange rate. However, due to the restriction set by the small number of observations the Granger-Engle methodology was chosen.

[19] *GRANT* in equation 3 and *REMODA* in equation 5 were significant at the 76 per cent and the 14 per cent levels, respectively. When re-estimated without *GRANT* the coefficients of equation 3 just showed marginal differences. We therefore choose to leave the equation unchanged.

Table 2: Estimation of the determinants of the Cape Verdean real exchange rate, 1980-2000

Equ. Var.\	(1)	(2)	(3)	(4)	(5)	(6)
CONST.	7.049	7.928	6.328	7.503	8.427	7.656
	(9.767)	(12.867)	(8.170)	(11.095)	(7.674)	(8.155)
REMIT	-0.123		-0.133		-0.625	-0.561
	(-3.253)		(-3.030)		(-1.975)	(-2.667)
ODA	-0.086				-0.464	
	(-1.946)				(-1.929)	
REMODA		-0.196				
		(-3.350)				
INTREMODA					0.140	
					(1.597)	
GRANT			-0.017			-0.412
			(-0.314)			(-2.095)
REMGRANT				-0.186		
				(-2.251)		
INTREMGRA						0.139
						(2.072)
EXPIMP	0.118	0.102	0.098	0.084	0.088	0.068
	(3.681)	(3.111)	(2.754)	(2.191)	(2.463)	(1.944)
TOT	-0.441	-0.583	-0.325	-0.496	-0.423	-0.322
	(-3.128)	(-4.777)	(-2.179)	(-3.590)	(-3.174)	(-2.440)
EXCRE	-0.253	-0.313	-0.196	-0.225	-0.250	-0.211
	(-2.763)	(-3.574)	(-1.915)	(-2.080)	(-2.904)	(-2.320)
TREND	-0.016	-0.018	-0.012	-0.019	-0.013	-0.011
	(-5.387)	(-7.272)	(-2.354)	(-4.938)	(-4.478)	(-2.443)
R^2	0.923	0.905	0.900	0.873	0.938	0.928
F-value	24.124	24.760	18.020	17.805	23.716	20.296
D-W	2.247	1.851	2.056	1.779	2.289	2.055
ADF-t	-4.669	-3.824	-4.242	-3.677	-4.823	-4.278
LM(1)[a]	0.345	0.106	0.025	0.200	0.759	0.240
LM(1-2)[a]	3.652	2.012	6.282	0.911	2.789	2.373
ARCH(1)[b]	0.512	0.983	0.401	0.435	0.095	0.000
ARCH(1-2)[b]	0.832	1.327	0.845	0.615	0.242	0.166
RESET[c]	1.934	26.197	4.050	2.032	3.482	6,909

Notes: *t*-value in parenthesis.
a) Chi-square LM test. b) Chi-square ARCH test. c) F-value RESET test.
Variables: See Table 1.
Sources: Bank of Cape Verde, the IMF (*International Financial Statistics*) and the World Bank (*World Bank Africa Database*).

The inclusion of the interaction term allows us to separate different effects of capital inflows on real exchange rate. Equations 5 and 6 indicate that, taken separately, private transfers and foreign aid strongly affects the real exchange rate in an appreciative way. Note that the coefficient of the remittance variable in absolute terms is larger than that of foreign assistance, which means that the appreciative effect of a similar percentage change in remittances and foreign assistance is stronger for remittances than for foreign aid. The coefficients of *REMIT*, *ODA* and *GRANT* can be interpreted in terms of traditional Dutch Disease. However, as suggested in Section 3 we can expect that capital inflows over time give rise to a positive supply effect, which tends to depreciate the real exchange rate. The interaction terms say that the higher the level of official aid the larger will be the depreciative effect of an increase in remittances (and vice versa). The relative sizes of the coefficients of *REMIT* and the interaction terms, in combination with the level of aid, determine the magnitude of the impact on the real exchange rate.

Remittances and aid have to complement each other in order for the supply effect to take place. For example, the productive impact of remittances invested in an economy characterised by a lack of human capital and deficient technical and social infrastructure will be limited. Foreign aid can increase the efficiency of investments out of remittances by removing these bottlenecks, e.g. through improving roads, education, and health.[20] Similarly, remittances can increase the marginal productivity of aid through contributing the private financial capital necessary for reaping the benefit of infrastructural improvements.

Official assistance that after the first years of independence in 1975 mostly came in the form of food aid, now to a larger extent is directed towards the production sectors. With the increasing inflow of remittances there has also been a change in its composition – while most of it used to be for the purpose of increasing the recipients' consumption possibilities, a larger share now is directed towards savings and investment. Capital inflows aimed at different purposes affect the recipient economy in

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[20] For a similar analysis of the potential of foreign aid to remove structural bottle necks in the recipient economy and thereby mitigating the Dutch Disease effects, see Falck (2000).

different ways. Therefore, changes in the composition of remittances and aid are expected to influence the real exchange rate and resource allocation.

The results of Table 2 support the view that official foreign assistance has contributed to limiting the negative impact of emigrants' remittances on the real exchange rate. A reason for this may be the change in the mix of official assistance during the 1990s, with greater emphasis put on human capital accumulation, the building up of productive capacity and economic infrastructure and, on the other hand, a smaller role given to food aid.[21] The new aid mix is more growth promoting, which may explain the less damaging effect of emigrants' remittances on the competitiveness of the Cape Verdean economy.

5. In Search of Export Competitiveness

During the past decade, the real exchange rate in Cape Verde has appreciated by more than 14 percent. The competitiveness of the economy has deteriorated by the same order of magnitude. Most of the deterioration can be ascribed to remittance inflows, which have increased twofold during the period. It is in part to resist this loss of competitiveness that the successive governments in Cape Verde have introduced measures aimed at improving the competitiveness and attractiveness of the trading sector. The creation of export processing zones in Mindelo and Praia, the temporary tax reduction on profits for exporting firms, and the exemption from customs duties on intermediate products are the kinds of measures introduced to outweigh the negative impact of remittances on the competitiveness of the economy.[22] The measures have been rather successful, with the share of manufacturing export jumping from 20 to 80 percent of total export over the past decade. In the past couple of years, serious concern has been expressed about the renewed lack of competitiveness, as illustrated by the closing down of foreign-owned enterprises in the export processing zones. The government has also initiated studies, whose main objective is to find ways to improve the international competitiveness and growth of the economy.

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[21] Food aid only accounted for 20 percent of official assistance in the late 1990s while it amounted to some 40 percent in the early 1980s. In the meantime, social and economic infrastructure increased from 20 to more than 40 percent of total assistance.

[22] On the different measures, see Bourdet (2000) and (2001).

Earlier studies have concentrated on the impact of remittances at the micro level, for instance income and poverty, in recipient countries. Our study shows that an assessment of remittances also requires an evaluation of their macroeconomic impact. A policy implication of our study for Cape Verde is that a more growth-oriented aid (and presumably economic) policy can contribute to limiting the negative impact of remittances on the country's competitiveness. Another, more specific policy implication is that the suppression of the special, better-remunerated deposit accounts for emigrants' remittances can contribute to improving the competitiveness of the trading sector, even though in the long run investments in non-tradables will make this improvement less sizeable. This measure should have a depreciative effect on the real exchange rate, encouraging export growth. Note that this measure will not affect the remittances motivated by altruistic consideration. Introducing such a measure will, however, encounter two main difficulties. First, it will put strong pressure on the fixed exchange rate regime and the peg between the Cape Verdean Escudo and the Euro. Second, there is a political economy dimension with the banking system, the beneficiaries of the credits granted by the banking system, the bulk of them for residential construction, and the construction sector being the main potential opponents to such a measure, and those employed in the trading sectors (both current and potential workers) being the main supporters. The aspirations and interests that the Cape Verdean political system will be most inclined to consider will be decisive for the chosen path and the future competitiveness of the economy.

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