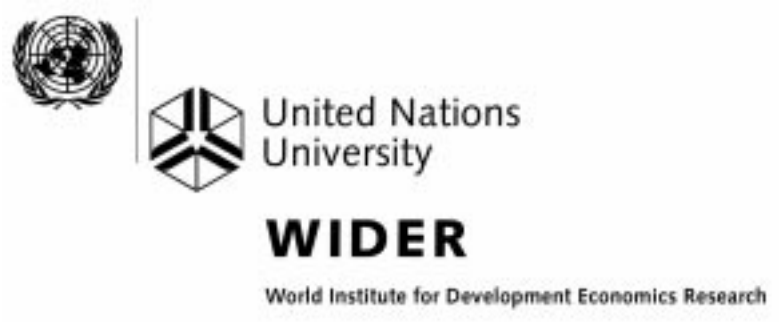

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Sovereign Debt and Uncertainty in the Mozambican Economy

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Abstract

This paper studies the impact of uncertainty and debt crisis on the dynamics of the Mozambican economy over the last two decades. Investment boom and accelerated growth did not take place until peace and economic reforms were assured, helped by the role of the Paris Club creditors as senior lenders, which averted the adverse impact of a debt overhang. Innovations to private consumption and to income are positively and strongly correlated. Current account has shown persistent deterioration while private consumption is not strongly correlated with uncertainty. These facts suggest that neither the permanent-income and life-cycle theories, nor the precautionary-saving and liquidity-constraint hypotheses can fully explain macroeconomic dynamics displayed by data. In light of this evidence, a simple dynamic model with stochastic income is presented. The model predicts that at low levels of wealth, uncertainty becomes unimportant in consumption decisions; and that when consumption is close to survival requirements, uncertainty drives the economy to wealth depletion.

Keywords: sovereign debt, capital accumulation, uncertainty, Mozambique

JEL classification: F34, O19, O55

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1 Introduction

Two related questions may be asked about the impact of uncertainty and debt crisis on the dynamics of the Mozambican economy. First, if external debt were reduced to zero today, would the government immediately gain access to borrowing from international financial markets? The most likely answer is 'no', counter the prediction of the Krugman hypothesis (1989) that the secondary-market value of an excessively large stock of debt is lower than its face value, as it signals a high probability that the debtor government will default. Debt reduction would move the country along a debt Laffer curve to the region where face value and secondary-market value of debt are equal. Second, does the dynamics of the Mozambican economy conform to theoretical predictions? The options-approach to investment under uncertainty postulates that if investments involve sunk costs and there is an option to wait, private investment will be negatively associated with uncertainty. The precautionary-savings literature suggests that uncertainty induces savings, as risk-averse individuals will attempt to hedge against future bad states of the nature. However, these two theories, if combined, lead to a contradicting prediction that uncertainty, on the one hand, deters investment and, on the other, raises saving. With high savings, how do we explain the fact that defaults and uncertainty are often associated, especially if international financial markets provide the insurance for risk-averse individuals?

Mozambican data are limited in terms of both quality and time coverage. Further, not only has the country been vulnerable to natural disasters, but also has been subject to significant economic and political changes in connection with the introduction of economic reforms in 1987 after attempted central planning, after the introduction of multi-party democracy in 1990, and the peace agreement in 1992. These events have introduced within a short period structural breaks in the economy, imposing constraints to the level and detail of data analysis. However, if important events are taken into account, the time trend and simple correlations between variables are informative. Results presented in section 3 show that war—a major source of uncertainty—depressed the economy and private consumption, while economic reforms were associated with investment boom. Innovations of private consumption and of income are strongly and positively correlated, questioning the permanent-income and life-cycle hypotheses. Persistent deterioration of the current account and non-significant correlation between consumption and the standard deviation of gross domestic product (used as a measure of uncertainty) suggest that precautionary saving and liquidity constraints may not fully explain Mozambique's macroeconomic developments over the last two decades.

In light of this evidence, section 4 presents a simple dynamic model with stochastic output and constant relative risk-aversion preferences, borrowing heavily from dynamic portfolio theories. No investment irreversibility is assumed, but the prediction is clear: uncertainty in the domestic economy makes domestic capital unattractive to risk-averse individuals. The impact of uncertainty on consumption and savings, however, depends on the level of wealth. At a similar level of uncertainty, a wealthy individual will take care to pay insurance, while the amount that a poor individual consumes or saves depends on income. Further, if consumption falls toward survival levels, uncertainty causes individuals to run down assets. Dynamically, an economy with these characteristics is headed to wealth depletion, and risk-averse lenders in the international financial markets will not extend credit to such an economy.

To begin, the next section reviews (albeit only a small portion of the rather large) theoretical and empirical literature on the impact of uncertainty on economic dynamics.

2 Uncertainty and economic dynamics: literature review

The negative impact of uncertainty on economic performance has been highlighted in recent literature. On average, countries with volatile growth tend, particularly in the developing world, to grow less (Ramey and Ramey 1995; Elbadawi and Schmidt-Hebbel 1998). In fact, low and volatile growth rates have been a distinctive characteristic of Sub-Saharan Africa economies since the 1960s (Weeks 2001). What empirical researchers have observed at the aggregate level has microeconomic foundations. How do economic agents react in the face of uncertainty? This section reviews some theoretical predictions on the choices made by economic agents under uncertainty, with a focus on sovereign debt, investment, and consumption and saving. As any of these topics are large enough to warrant a paper, the literature review presented below cannot be exhaustive.

2.1 Debt overhang

When debtors are risk averse, debt crises are essentially phenomena induced by uncertainty, with negative shocks on income leading to debt-service difficulties. If, as a result, creditors cut off the supply of credit, the debtor country experiences a rise in the shadow cost of capital, reduced investment and economic decline. In fact, according to the debt-overhang hypothesis put forward by Krugman (1988, and 1989) and Sachs (1984, 1989a, and 1989b), default need not occur for a debt crisis to generate a negative impact on the economy. On the one hand, excessive stock of debt signals the likelihood that returns to capital will be taxed away to creditors; on the other, enormous stocks of debt are an indication of a high default probability. Hence, not only do investors shy away, but the country will also become credit constrained.

Empirically testing the hypothesis that a market value of debt as a function to its face value follows a Laffer curve, is hindered by the fact that debts of most developing countries are not traded in secondary markets. Most studies are concentrated on the hypothesis that high stock of debt reduces investment. Warner (1991) finds that the forecast of investment, based on exogenous shocks in the international markets such as terms of trade and US interest rates, were good predictors of the low investment levels experienced by developing countries in the 1980s. Cohen (1993) finds that a 'surprise' drop in investment below its predicted level was not significantly correlated with debt stock. Warner's and Cohen's results suggest that the debt crisis was not the cause of the low investment level observed in most developing countries in the 1980s. However, Borensztein (1990) finds that debt reduction boosted investments in the Philippines. In Sub-Saharan Africa, high stocks of debt were reported negatively correlated with private investment in Servén (1997). Elbadawi, Ndulu, and Ndung'u (1997) find that countries whose debt stock as a proportion of their gross domestic products was greater than 0.97 suffered debt overhang. Econometric tests using nominal stocks of debt may fail to capture the essence of a debt overhang unless 100 per cent of debt was contracted on market terms (Agénor 2000 and Gode 2000). One thing, however, is clear—payment

arrears are twice as likely to occur in Sub-Saharan Africa as in the world at large (Elbadawi and Schmidt-Hebbel 1998).

2.2 Investment

When investment decisions are fully reversible, the optimal rule of capital accumulation is that investment should continue until marginal product equals marginal cost of capital. In a dynamic context, this rule can only apply in perfect competition with complete markets, and constant returns to scale in production. Free entry means that no investment decisions can be delayed, as other firms will immediately seize the opportunity. As Caballero (1991a) demonstrates, current and future investment decisions for a perfect competitor are independent. Earlier, Arrow (1968) has argued that in practice investments are not fully reversible. Producers are confronted with asymmetric adjustment costs. It is easy to install capital but costly to dismantle. Irreversibility is a serious problem in most developing countries where stock markets are either underdeveloped or nonexistent. Even in advanced economies where secondary markets for most types of capital are fairly efficient, the resale price of capital is often lower than the purchase price because of the 'lemon effect'—investors selling their factories when the industry is depressed, exactly when everyone else also wants to sell (Abel *et al.* 1996).

The irreversibility of investment decisions is the basic premise of the options-approach to investment under uncertainty. According to theory, investment opportunities are seen as financial options, whose value is determined by the value of the underlying asset (the investment project), volatility of the asset's value, and the time available until expiration. If capital equipment can be resold later, installing it now acquires a put-option, while the opportunity to install plant equipment in the future is a call-option (Abel *et al.* 1996). Complete irreversibility rules out put-options. Caballero and Pindyck (1996) and Pindyck and Solimano (1993) stress that it is not uncertainty itself that acts as a deterrent to private investment, but the probable distribution of future values of marginal profitability of capital. Hence, it is important to distinguish between idiosyncratic shocks and aggregate shocks, and to identify the market structure. Impacts of idiosyncratic shocks on profits may be symmetrically distributed, but aggregate shocks always affect profits asymmetrically. Take, for example, a negative shock on the price of a commodity. The result will depress profits in the relevant industry, but a price increase will not necessarily raise profits, as new firms enter and existing producers expand their capacity. Monopolies are examples of asymmetric probability of distribution of future profits because, concerned about excess future capacity, they tend to underinvest.

Empirically, evidence of the negative association between investment and uncertainty is fairly robust. In cross-country studies, Aizenman and Marion (1999) find that different volatility measures are negatively correlated with investment in developing countries.[1] Pindyck and Solimano (1993) find that while correlation of private investment with

[1] Volatility measures employed by Aizenman and Marion (1999) were: (*i*) standard deviations of residuals of government consumption expenditures as a percentage of GDP, nominal money growth, changes in real exchange rates, calculated from their first-order autoregressive processes; (*ii*) an index constructed by the weighted average of the measures listed in (*i*); and (*iii*) the standard deviation of innovations from a growth equation.

volatility of marginal profitability of capital not only had the wrong sign (positive) but also was not significant in their sample of OECD countries, this correlation was negative and significant in the sample of developing countries. For Sub-Saharan Africa, Servén (1997) finds among indicators of uncertainty that volatility of terms of trade, external debt and war were significant and negatively correlated with private investment. At the corporate level, Caballero and Pindyck (1996) find that doubling the industry-wide standard deviation of growth in marginal profitability raised the hurdle rate-of-return on new capital by 20 per cent in four-digit US manufacturing. Calcagnini and Saltari (2000), using data from surveys on manufacturing sector, find that investment increased with an anticipated improvement in demand, and declined with volatility of demand. In repeating the same study for a panel of European countries (Calcagnini and Saltari 2001), the result was the same.[2] Using a panel data from manufacturing sector, Pattillo (1998) finds that the combination of uncertainty and irreversibility raised the hurdle level of the value of marginal productivity of capital at which firms in Ghana decide to invest.

2.3 Consumption and saving

The permanent-income and life-cycle hypotheses postulate that consumption at each point in time is a portion of the expected lifetime wealth. Individuals smooth their consumption saving during the working age and dissaving at retirement. This consumption pattern generates a hump-shaped saving schedule with a simple implication: consumption does not react to transitory shocks on income; unexpected windfalls are saved, whereas negative shocks will be faced either with a reduction in saving or borrowing. If these hypotheses are true, the following facts in the United States of America are puzzling (Zeldes 1989). First, studies that specify the stochastic processes of consumption and income, enabling them to disentangle permanent components from the transitory, find that transitory income components have an impact on consumption. Hall and Mishkin's (1982) study of covariation between food consumption and income finds that even though consumption was more strongly correlated with permanent income, consumption responses to transitory income movements were 'vigorous'. Second, in the Ramsey model, equilibrium consumption grows only if interest rate (r) is higher than time preference rate (ρ), a rule given by the following Euler equation:

$$\frac{\dot{c}}{c} = -\frac{1}{\eta(c)}(r - \rho)$$

where $\eta(c) = cu''(c)/u'(c)$, with c being consumption and $\dot{c}$ its time derivative; and $u'(c)$ and $u''(c)$, the first and second total derivatives of utility function u(c). Time preference rate is always assumed to be positive. Deaton (1987) notes that in the post World War II period, consumption had been growing in the US, except in 1974, despite the fact that real interest rates were negative in the periods 1955-59, 1968-69, and 1971-80. Finally, why is it that retirees do not appear to be reducing their wealth fast enough to be consistent with the life-cycle hypothesis?

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2 Data were drawn from business surveys in seven countries: Belgium, France, Germany, Italy, Ireland, the Netherlands, and the United Kingdom.

An attempt to provide answers to these questions gave rise to the hypotheses of precautionary savings and savings with liquidity constraints, both of which evoke uncertainty. According to the precautionary-savings hypothesis, individuals faced with uncertainty use current earnings to hedge against future misfortunes. Following this line of approach, Caballero (1991b) and Skinner (1988) produced simulation results suggesting that wealth due to precautionary savings could, in the United States, account for more than 60 per cent above the level predicted by the life-cycle hypothesis. In a sample of households aged 50 years old or under, Carroll and Samwick (1997) produced findings that support the theory that uncertainty significantly contributes to wealth accumulation. Both permanent and transitory shock variances exerted positive impact on wealth, even though the impact of permanent variance was greater. The hypothesis of savings with liquidity constraints has been pursued by Deaton (1990, and 1991), who argues that uncertainty plays an even greater role in developing countries, as these economies rely on agriculture and the export of primary commodities for which prices evolve erratically in the international markets. Further, households tend to be credit constrained either because of financial repression or because financial intermediaries are reluctant to lend to individuals who have no collateral, and whose income depends on unpredictable and seasonal agricultural production. Having to cope with income volatility on their own, households accumulate assets in the form of buffer stock to smooth out consumption.

The hypotheses of precautionary saving and liquidity constraints have not been tested in the developing countries. All the findings suggest is that the permanent-income and life-cycle hypotheses do not explain consumption behaviour in these economies. Schmidt-Hebbel, Webb, and Corsetti (1992) used trend income as a proxy to permanent income, and the deviation from this trend to proxy transitory income. The finding is that the coefficient of deviation of income from its trend was 0.3—too low to conform to the theory that transitory income is saved, as predicted in the permanent-income and life-cycle hypotheses. Interestingly, the same coefficient is later found by Elbadawi and Mwega (2000). Another fact about Sub-Saharan Africa economies is that they are characterized by low saving, correlated with poor economic growth. From a disposable income of 11.4 per cent in the 1970s, private saving declined to 7.5 per cent in the 1980s, recovering only to less than 9 per cent in the 1990s (Elbadawi and Mwega 2000). In view of the ‘stylized’ facts of the region’s households not having access to financial markets and poor economic performance being associated with uncertainty, it is hard to understand how savings have been so low. More difficult to reconcile with these theories is the fact reported by Elbadawi and Schmidt-Hebbel (1998) that payment arrears are twice as likely in Sub-Saharan Africa as in the world at large. Even in the American economy, Skinner (1988), after arguing that precautionary savings made a significant contribution to wealth accumulation, produces a ranking of professions in which the self-employed and salespersons had lower income and were believed to be more volatile than professionals. Actually, self-employed and salespersons saved less.

3 The Mozambican case

Section 2 reviews the literature that highlights the role of uncertainty on economic dynamics with focus on debt overhang, investment, and consumption and saving-decisions. It was seen that studies on Sub-Saharan Africa portray the region as having a combination of high risk-discouraging investment, low savings, and high

probability of arrears in debt service. At the aggregate level, these facts are apparent in the low and volatile rates of economic growth. Unfortunately, the post-independence Mozambican economic history does not differ from this gloomy image. Shortly after independence, the economy dearly experienced the consequences of an attempted central planning, and war. In the early 1980s, the crisis was already deep, and in 1983 only 33 per cent of debt service due was met. In September 1984, the country joined the International Monetary Fund and the World Bank, and later that year was able to sign a rescheduling agreement with the OCED countries' Paris Club. The introduction of the economic rehabilitation programme in 1987 enabled the country not only to gain access to further rescheduling agreements, but also to concessional finance. This gave seniority to the Paris Club to dictate the terms of debt relief. Official creditors, unwilling to abide by the rules of the Club,[3] were not repaid. In October 1992 a peace agreement was signed, bringing political stability. Despite vibrant economic growth averaging 7-8 per cent a year in the post-war period, Mozambique remains one of the poorest countries in the world. Per capita gross domestic product is below US$ 240, and 70 per cent of the population lives below the national poverty line. Most social indicators such as literacy, life expectancy, child mortality, are worse than Sub-Saharan Africa averages. To all this, add vulnerability to natural droughts, hurricanes, and floods. Thus, not surprisingly, Mozambique is one of the heavily indebted poor countries (HIPCs), and reached the completion point of the HIPC debt initiative in June 1999, and the decision point for the enhanced initiative in April 2000.

This section studies the impact of external debt and uncertainty on the dynamics of the Mozambican economy. Certainly, the facts narrated above have introduced structural breaks, and in a very short period the economy has been successively under different economic models. In addition, data are limited. Only two modest questions are asked. First, do key variables display any trend? Second, if major events (war and reforms) are taken into account, is there any evidence of variables moving together? The analysis that follows is simple and tentative. When a measure of debt burden increases, investment and economic growth should fall, if the debt-overhang hypothesis is true. When a measure of uncertainty increases, investments should fall, as predicted by the theory of investment under uncertainty. No continuous and reliable data on private saving are available. Instead, private consumption and current account are used. Private current account is derived by subtracting public deficit from the economy's current account balance. If uncertainty induces precautionary saving, private consumption should fall, and current account should improve when the measure of uncertainty increases. Data, compiled and adjusted by Gode (2000) from dispersed and often conflicting sources,[4] cover the period 1979-99. Macroeconomic aggregates are expressed in 1000 million Mozambican meticais, 1998 prices. In order to work with a comparable scale, indexes (base year 1979) are used. (Logarithms are often used for this purpose, but when some variables register negative values logarithms cannot be taken. Investment and current account of the balance of payments registered negative values.)[5]

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3 Mainly Russia, which inherited the debt of the former Soviet Union.

4 Including publications by Bank of Mozambique, government of Mozambique, International Monetary Fund, and World Bank (provided as Appendix).

5 The drawback of index numbers is that if the base-year-value is negative (as it was the case with the current account) the index will increase with the deterioration of the variable and vice-versa. In order to avoid this problem, whenever such was the case the resulting index was multiplied by –1.

Table 1 produces regressions of indexes (of per capita values) of key variables on time, on a dummy taking the value 1 for the war period and zero otherwise, and on another dummy taking the value 1 for the reform period and zero otherwise. Markedly, gross domestic product, investment, arrears, aggregate current account balance and private-sector current account have a significant time trend. Gross domestic product registered an average growth rate of 1.6 per cent a year. Private investment grew at 27 per cent a year while total investment grew at 13.6 per cent. Growth in investment and gross domestic product was accompanied by an accumulation of arrears (which increased at 7 per cent a year) and by a current-account deterioration of 14 per cent a year, with the private-sector current account registering the highest deterioration (35.1 per cent a year). War adversely affected per capita GDP, affecting private consumption in the same way. The reform period has registered an investment boom, an accumulation of arrears and a deterioration of the current account, reflecting the Paris Club's role as senior lenders at work. Per capita debt service does not display any significant time trend; however, war seems to have reduced the country's ability to repay the debt, with the dummy for war and time trend becoming significant at the 10-per cent level when all the regressors are considered. The column of standard deviations shows that private consumption is the most stable variable, with 0.13 standard deviations, while private investment and private current account are the most volatile variables with 2 and 3.4 standard deviations, respectively.

Table 1
Time trend of variables

Variable	Intercept	Time	War	Reform	S. D. of variable	No. of observations	$\overline{R}^2$
Gross domestic product							
(*A*)	0.736	0.016			0.198	21	0.20
	[9.149]	[2.424]					
(*B*)	1.272	-0.009	-0.392		0.198	21	0.49
	[7.533]	[-1.056]	[-3.430]				
(*C*)	0.706	0.032		-0.245	0.198	21	0.27
	[8.999]	[2.843]		[-1.742]			
(*D*)	1.212	-0.001	-0.356	-0.087	0.198	21	0.47
	[6.223]	[-0.080]	[-2.766]	[-0.651]			
Private consumption							
(*A*)	0.814	-0.007			0.134	21	-0.05
	[13.064]	[-0.142]					
(*B*)	1.311	-0.024	-0.364		0.134	21	0.52
	[11.930]	[-4.127]	[-4.899]				
(*C*)	0.794	0.010		-0.161	0.134	21	0.00
	[12.776]	[1.138]		[-1.445]			
(*D*)	1.313	-0.024	-0.365	0.002	0.134	21	0.50
	[10.224]	[-2.362]	[-4.306]	[0.019]			
Private investment							
(*A*)	-0.340	0.270			2.064	21	0.64
	[-0.712]	[6.029]					
(*B*)	-1.699	0.330	0.950		2.064	21	0.64
	[-1.150]	[4.241]	[0.951]				
(*C*)	-0.070	0.090		2.662	2.064	21	0.75
	[-0.147]	[1.307]		[3.107]			
(*D*)	0.199	0.072	-0.189	2.747	2.064	21	0.74
	[0.140]	[0.638]	[-0.201]	[2.816]			

Table continues

Table 1 (con't)
Time trend of variables

Variable		Intercept	Time	War	Reform	S. D. of variable	No. of observations	$\overline{R}^2$
Total investment								
	(*A*)	0.420	0.136			1.054	21	0.62
		[1.435]	[5.826]					
	(*B*)	-0.106	0.160	0.385		1.054	21	0.61
		[-0.136]	[3.912]	[0.731]				
	(*C*)	0.586	0.046		1.335	1.054	21	0.73
		[2.304]	[1.252]		[2.925]			
	(*D*)	0.880	0.026	-0.207	1.427	1.054	21	0.72
		[1.164]	[0.440]	[-0.415]	[2.758]			
Debt service								
	(*A*)	1.071	-0.015			0.614	21	-0.03
		[3.801]	[-0.679]					
	(*B*)	2.079	-0.062	-0.737		0.614	21	0.04
		[2.906]	[-1.650]	[-1.523]				
	(*C*)	1.095	-0.028		0.191	0.614	21	-0.08
		[3.700]	[-0.661]		[0.360]			
	(*D*)	2.520	-0.122	-1.002	0.638	0.614	21	0.06
		[3.133]	[-1.914]	[-1.886]	[0.551]			
Arrears								
	(*A*)	0.587	0.073			1.013	21	0.16
		[1.397]	[2.194]					
	(*B*)	-1.517	0.171	1.539		1.013	21	0.31
		[-1.520]	[3.260]	[2.280]				
	(*C*)	0.872	-0.082		2.306	1.013	21	0.53
		[2.702]	[-1.771]		[3.978]			
	(*D*)	-0.144	-0.015	0.715	1.987	1.013	21	0.54
		[-0.155]	[-0.208]	[1.166]	[3.126]			
Current account								
	(*A*)	-0.892	-0.140			1.219	21	0.49
		[-2.256]	[-4.464]					
	(*B*)	-0.132	-0.176	-0.556		1.219	21	0.48
		[-0.125]	[-3.186]	[-0.784]				
	(*C*)	-1.168	0.010		-2.230	1.219	21	0.73
		[-3.941]	[0.236]		[-4.192]			
	(*D*)	-1.812	0.052	0.453	-2.432	1.219	21	0.72
		[-2.082]	[0.761]	[0.788]	[-4.083]			
Private current account								
	(*A*)	-0.212	-0.351			3.412	21	0.38
		[-0.174]	[-3.620]					
	(*B*)	1.833	-0.446	-1.496		3.412	21	0.36
		[0.565]	[-2.612]	[-0.681]				
	(*C*)	-1.082	0.123		-7.030	3.412	21	0.68
		[-1.212]	[0.961]		[-4.387]			
	(*D*)	-3.561	0.287	1.743	-7.808	3.412	21	0.68
		[-1.375]	[1.397]	[1.019]	[-4.403]			

Note: *t* ratios in square brackets.

Parts A, B, C, and D of Table 2 present correlation coefficients between residuals from regressions A, B, C, and D, from Table 1, respectively. Most variables remain as defined in Table 1 (but now residuals of regressions), except debt service, which is expressed as a proportion of GDP. The square of this proportion is also included to test the overhang effect on investment and economic growth. Innovations to GDP and private consumption are derived from first-order autoregressive schemes. Innovations to GDP are used to generate standard deviations of GDP.

Theoretically, GDP should be strongly correlated with private investment. This fact is denied in part A of Table 2, suggesting that investment has not been an unconditional determinant of GDP. Instead, when war and reforms are taken into account in parts B, C, and D, investment becomes significantly correlated with GDP. In part A, GDP growth is significantly and negatively correlated with the square of debt service to GDP ratio, but this significance disappears when war and reforms are included in parts B-C. This result is not surprising, since debt burden was the highest in the war period before the introduction of reforms, and was alleviated by successive rescheduling mechanisms, arrears to creditors outside Paris Club, and foreign aid after 1987. In all the cases, private consumption is strongly correlated with GDP. What cannot be explained by the permanent-income and life-cycle hypotheses is the strong and positive correlation between innovations of GDP and innovations of private consumption in all the cases. This correlation suggests that private consumption is highly responsive to income shocks. One may argue that high responsiveness of consumption to income shocks is due to uncertainty and liquidity constraints. Standard deviation of GDP was used as a measure of uncertainty, but this measure is not significantly correlated with private consumption in any of the cases. In part A, the standard deviation of GDP is significantly and positively correlated with private current account. However, since the standard deviation of GDP is not significantly correlated with private consumption, this improvement in the current account cannot result from a precautionary motive for savings; it results from reduced foreign direct investment, as deterred by uncertainty. Correlation between the current account and economic growth is significant when both war and reforms are taken into account (part D), suggesting that saving and improvements in the current account require both peace and reforms. Private investment does appear to be significantly and negatively associated with uncertainty in part A, but once war and reforms are taken into account, this correlation is no longer significant. Economic reforms appear to have been a major determinant of private investment, and war (again confirmed as a major source of uncertainty). In all the cases, investment is significantly and negatively correlated with the current account.

Perhaps the association between the current account and investment deserves some elaboration. In the gap models, foreign exchange is always a binding constraint to economic growth, as domestic investment requires foreign transfers.[6] In the neoclassical

6 Gap models are originally associated with Chenery and Strout (1966), known as ‘two-gap’ models—a gap in domestic savings and another in foreign exchange. ‘Three-gap’ models, adding a fiscal constraint, are associated with the work of Bacha (1990) and Taylor (1993 and 1994).

Table 2
Correlation matrices of variables

	GDP	GDP growth	S. D. of GDP	Inov. of GDP	Private consump.	Inov. of private cons.	Total investment	Private investment	Current account	Private current account	Debt service	Sq. of debt service
Part A: Detrended variables												
GDP	1											
GDP growth	0.286 [1.266]	1										
S.D. of GDP	0.292 [1.295]	-0.016 [-0.068]	1									
Inov. of GDP	0.415 [1.935]	0.990 [29.774]	0.027 [0.115]	1								
Private consumption	0.956 [13.826]	0.253 [1.109]	0.212 [0.920]	0.377 [1.727]	1							
Inov. of private cons.	0.385 [1.770]	0.855 [6.994]	-0.086 [-0.366]	0.867 [7.382]	0.444 [2.102]	1						
Total investment	0.223 [0.970]	0.302 [1.344]	-0.399 [-1.846]	0.319 [1.428]	0.187 [0.808]	0.457 [2.180]	1					
Private investment	0.052 [0.221]	0.340 [1.534]	-0.510 [-2.515]	0.330 [1.483]	0.014 [0.059]	0.454 [2.162]	0.949 [12.771]	1				
Current account	0.18 [0.776]	-0.161 [-0.692]	0.4 [1.852]	-0.127 [-0.543]	0.085 [0.362]	-0.42 [-1.963]	-0.752 [-4.840]	-0.704 [-4.206]	1			
Private current account	0.237 [1.035]	-0.207 [-0.898]	0.472 [2.271]	-0.163 [-0.701]	0.131 [0.561]	-0.439 [-2.073]	-0.712 [-4.302]	-0.71 [-4.278]	0.973 [17.886]	1		
Debt service	0.386 [1.775]	0.167 [0.719]	-0.207 [-0.898]	0.214 [0.929]	0.457 [2.180]	0.342 [1.544]	0.492 [2.398]	0.344 [1.554]	-0.466 [-2.234]	-0.463 [-2.216]	1	
Sq. of debt service	0.085 [0.362]	-0.484 [-2.347]	0.141 [0.604]	-0.447 [-2.120]	0.046 [0.195]	-0.416 [-1.941]	-0.159 [-0.683]	-0.224 [-0.975]	0.171 [0.736]	0.169 [0.727]	0.294 [1.305]	1

Note: *t*-values in square brackets

Table continues

Table 2 (con't)
Correlation matrices of variables

	GDP	GDP growth	S. D. of GDP	Inov. of GDP	Private consump.	Inov. of private cons.	Total investment	Private investment	Current account	Private current account	Debt service	Sq. of debt service
Part B: Conditioned for war												
GDP	1											
GDP growth	0.489 [2.378]	1										
S. D. of GDP	0.048 [0.204]	-0.388 [-1.786]	1									
Inov. of GDP	0.638 [3.515]	0.984 [23.431]	-0.333 [-1.498]	1								
Private consumption	0.952 [13.195]	0.497 [2.430]	-0.088 [-0.375]	0.635 [3.487]	1							
Inov. of private cons.	0.655 [3.678]	0.888 [8.193]	-0.434 [-2.044]	0.919 [9.889]	0.737 [4.626]	1						
Total investment	0.454 [2.162]	0.004 [0.017]	-0.008 [-0.034]	0.098 [0.418]	0.531 [2.659]	0.287 [1.271]	1					
Private investment	0.294 [1.305]	0.011 [0.047]	-0.047 [-0.200]	0.070 [0.298]	0.352 [1.595]	0.231 [1.007]	0.948 [12.637]	1				
Current account	0.087 [0.370]	0.381 [1.748]	-0.038 [-0.161]	0.354 [1.606]	-0.078 [-0.332]	0.103 [0.439]	-0.741 [-4.682]	-0.690 [-4.044]	1			
Private current account	0.167 [0.719]	0.359 [1.632]	0.002 [0.008]	0.352 [1.595]	0.003 [0.013]	0.127 [0.543]	-0.701 [-4.170]	-0.699 [-4.147]	0.972 [17.550]	1		
Debt service	0.330 [1.483]	-0.050 [-0.212]	-0.167 [-0.719]	0.024 [0.102]	0.454 [2.162]	0.166 [0.714]	0.561 [2.875]	0.428 [2.009]	-0.525 [-2.617]	-0.518 [-2.569]	1	
Sq. of debt service	0.028 [0.119]	-0.353 [-1.601]	-0.138 [-0.591]	-0.306 [-1.364]	-0.048 [-0.204]	-0.296 [-1.315]	-0.138 [-0.591]	-0.213 [-0.925]	0.155 [0.666]	0.16 [0.688]	0.283 [1.252]	1

Note: *t*-values in square brackets

Table continues

Table 2 (con't)
Correlation matrices of variables

	GDP	GDP growth	S. D. of GDP	Inov. of GDP	Private consump.	Inov. of private cons.	Total investment	Private investment	Current account	Private current account	Debt service	Sq. of debt service
Part C: Conditioned for reforms												
GDP	1											
GDP growth	0.273 [1.204]	1										
S. D. of GDP	-0.195 [-0.843]	0.239 [1.044]	1									
Inov. of GDP	0.568 [2.928]	0.947 [12.507]	0.139 [0.595]	1								
Private consumption	0.951 [13.049]	0.187 [0.808]	-0.301 [-1.339]	0.478 [2.309]	1							
Inov. of private cons.	0.560 [2.868]	0.845 [6.704]	-0.010 [-0.042]	0.910 [9.312]	0.565 [2.905]	1						
Total investment	0.617 [3.326]	0.016 [0.068]	-0.309 [-1.378]	0.219 [0.952]	0.507 [2.495]	0.263 [1.156]	1					
Private investment	0.413 [1.924]	0.0912 [0.388]	-0.282 [-1.247]	0.216 [0.939]	0.302 [1.344]	0.249 [1.091]	0.924 [10.252]	1				
Current account	-0.179 [-0.772]	0.240 [1.049]	0.325 [1.458]	0.145 [0.622]	-0.250 [-1.095]	-0.114 [-0.487]	-0.601 [-3.190]	-0.499 [-2.443]	1			
Private current account	-0.102 [-0.435]	0.183 [0.790]	0.366 [1.669]	0.123 [0.526]	-0.193 [-0.834]	-0.129 [-0.552]	-0.531 [-2.659]	-0.506 [-2.489]	0.945 [12.258]	1		
Debt service	0.557 [2.845]	-0.091 [-0.388]	-0.488 [-2.372]	0.108 [0.461]	0.602 [3.199]	0.202 [0.875]	0.440 [2.079]	0.252 [1.105]	-0.423 [-1.981]	-0.423 [-1.981]	1	
Sq. of debt service	0.088 [0.375]	-0.259 [-1.138]	0.044 [0.187]	-0.193 [-0.834]	0.074 [0.315]	-0.185 [-0.799]	0.124 [0.530]	0.019 [0.081]	-0.114 [-0.487]	-0.120 [-0.513]	0.520 [2.583]	1

Note: *t*-values in square brackets

Table continues

Table 2 (con't)
Correlation matrices of variables

	GDP	GDP growth	S. D. of GDP	Inov. of GDP	Private consump.	Inov. of private cons.	Total investment	Private investment	Current account	Private current account	Debt service	Sq. of debt service
Part D: Conditioned for war and reforms												
GDP	1											
GDP growth	0.453 [2.156]	1										
S. D. of GDP	0.040 [0.170]	-0.042 [-0.178]	1									
Inov. of GDP	0.636 [3.497]	0.976 [19.015]	-0.026 [-0.110]	1								
Private consumption	0.966 [15.852]	0.420 [1.963]	0.080 [0.340]	0.600 [3.182]	1							
Inov. of private cons.	0.685 [3.989]	0.849 [6.817]	0.015 [0.064]	0.902 [8.864]	0.737 [4.626]	1						
Total investment	0.683 [3.967]	-0.026 [-0.110]	-0.051 [-0.217]	0.145 [0.622]	0.651 [3.639]	0.273 [1.204]	1					
Private investment	0.493 [2.404]	0.001 [0.004]	-0.145 [-0.622]	0.122 [0.521]	0.441 [2.085]	0.204 [0.884]	0.927 [10.486]	1				
Current account	-0.08 [-0.340]	0.58 [3.021]	-0.024 [-0.102]	0.482 [2.334]	-0.141 [-0.604]	0.246 [1.077]	-0.602 [-3.199]	-0.512 [-2.529]	1			
Private current account	0.03 [0.127]	0.56 [2.868]	0.089 [0.379]	0.492 [2.398]	-0.028 [-0.119]	0.293 [1.300]	-0.533 [-2.673]	-0.525 [-2.617]	0.942 [11.908]	1		
Debt service	0.452 [2.150]	-0.118 [-0.504]	0.058 [0.246]	0.009 [0.038]	0.506 [2.489]	0.141 [0.604]	0.449 [2.132]	0.275 [1.213]	-0.379 [-1.738]	-0.368 [-1.679]	1	
Sq. of debt service	0.162 [0.696]	-0.199 [-0.861]	-0.212 [-0.920]	-0.132 [-0.565]	0.16 [0.688]	-0.064 [-0.272]	0.16 [0.688]	0.025 [0.106]	-0.111 [-0.474]	-0.101 [-0.431]	0.593 [3.124]	1

Note: *t*-values in square brackets

theory, improvements in the current account are associated with increases in domestic savings and rises in the domestic shadow cost of capital.[7] With these theoretical arguments, it can be said that the strong and negative correlation between investment and current account reported in Table 2 suggests that domestic investment in Mozambique is foreign-exchange intensive. Therefore, at such a high opportunity cost, debt service crowds out investment.

4 Consumption and capital accumulation under uncertainty

Results from section 3 suggest the following about Mozambique. Private investment did not take place until the major sources of uncertainty were removed. Private consumption did not appear to be correlated with uncertainty (at least directly); instead, the levels and innovations of private consumption and of gross domestic product are strongly correlated. To the extent that these are associated with economic growth, both peace and reforms are essential for improvements in the current account—which can only be brought about by higher domestic saving. These facts corroborate others reported in the literature reviewed in section 3, particularly on Sub-Saharan Africa. Even though data are limited and the analysis merely tentative, the results seem intuitive given the level of poverty. After all, how does one afford insurance when the current income is so low that it barely covers minimum consumption requirements? An integrated framework to account for these facts is necessary.

4.1 The model

In fact, tools already exist in the literature. Sometime ago Merton (1969 and 1971) asked the question: What is the optimal rule for consumption and wealth accumulation when wealth portfolios include risky assets?[8] If future income is uncertain and negative shocks are non-insurable, the question applies to an economy at large. No wonder, portfolio models have proved useful in international finance. Recently Kraay and Ventura (2000) have used Merton's framework to study the simultaneous dynamics of current accounts in both creditor and debtor countries. The model presented below draws from both Merton, and Kraay and Ventura.

Imagine a small open economy inhabited by L persons, all in their working age, and endowed with a capital in the value of K. There is full employment, enabling us to focus on capital intensity, $k = K/L$. For simplicity it is assumed that population is stationary and capital does not depreciate. Capital and labour are combined in a homogeneous-of-degree one technology that can, therefore, be expressed in its intensive form:[9]

$$E(q) = f(k)$$

---

7 The role of current accounts as indicators of domestic shadow cost of capital was shown and tested by Cohen (1993).

8 Samuelson (1969) solves the same problem in discrete-time dynamic programming.

9 The model involves time-dependent variables. To save time and space the t argument is omitted except in the case where its presentation is necessary for the sake of clarity.

satisfying Inada conditions that $\lim_{k\to 0} f'(k) = \neq$ and $\lim_{k\to \neq} f'(k) = 0$. Commodity q is used for consumption and, if stored, contributes for wealth accumulation. In turn, wealth is either used in domestic investment increasing the stock of capital per capita (k) or invested abroad (increasing wealth held abroad, a^*). The operator E stands for expectations, because the economy is subject to random shocks [$\varepsilon(t)$] that are serially uncorrelated {$E[\varepsilon(s)\neq(t)] = 0$, for s and t standing for different points of time ($s\neq t$)}, with mean zero {$E[\varepsilon(t)] = 0$}, and a unit variance {$E[\varepsilon(t)]^2 = 1$}, output is stochastic:

$$q = f(k)dt + k\sigma dz$$

where σ is the standard deviation of returns to capital invested in production, and dz is a Wiener process with the property that $dz = \varepsilon(t)\sqrt{dt}$. As a result, wealth follows a Brownian motion:

$$da = [f(k) + r^*(a - k + k^*) - f'(k)k^* - c]dt + k\sigma dz$$

where r^* is the lending and borrowing rate of interest in the international financial markets (assumed risk free), k^* is per capita foreign direct investment, $f'(k)k$ is the amount of profit repatriation, and $c = C/L$ is consumption per capita, if the aggregate consumption is C. Whenever domestic wealth and foreign direct investment fall short of the desired stock of capital, the government sells bonds in amount b in the international financial markets; hence, the term $r^*(a - k + k^*)$ sums the net income of wealth invested abroad, taking a negative sign when the country is net debtor. An inventory at time $t = 0$, would have revealed the following wealth position:

$$a(0) = k(0) + a^*(0) - [b(0) + k^*(0)] \geq 0$$

Preferences are additive and separable, enabling us to focus on the representative consumer. These preferences are summarized by a constant relative risk aversion utility index:

$$u(c) = \frac{(c - \underline{c})^{1-\theta}}{1-\theta}$$

The parameter $\theta = -cu''(c)/u'(c)$ is a measure of local risk aversion, remaining constant at all levels of consumption, and $\underline{c}$ is the survival level of consumption. It can be easily seen that the utility index $u(c)$ has the property that $\lim_{c\to\underline{c}} u'(c\text{-}\underline{c}) = \infty$. The planning horizon is finite {$t\in[0,T]$} and the final stock of wealth $a(T)$ is valuated by the function $\beta[a(t)]$ ($\beta'>0$ and $\beta''<0$); hence the problem is one of finding a value such as:

$$V_0 = \max_{c>\underline{c}} \int_0^T \frac{(c - \underline{c})^{1-\theta}}{1-\theta} \exp(-\rho t)dt + \beta[a(T)] \qquad [1]$$

subject to:

$$a(0) = k(0) + a^*(0) - [b(0) + k^*(0)] \geq 0$$
$$da = [f(k) + r^*(a - k + k^*) - f'(k)k^* - c]dt + k\sigma dz$$
$$V[a(T)] = \beta[a(T)]$$

Initial conditions are given by $a(0)$, and the terminal conditions by $V[a(T)]$. The trajectory $V[a(t)]$ is unknown. But at any point of time $0<t<T$ the problem remains the same: the stocks accumulated until then will be known, and the remaining trajectory unknown. Making use of this Bellman's separation principle and applying Itô's lemma on the stochastic component we get:

$$-\frac{\partial V}{\partial t}=\frac{(c-\underline{c})^{1-\theta}}{1-\theta}\exp(-\rho t)+\frac{\partial V}{\partial a}\left[f(k)+r^{*}(a-k+k^{*})-f'(k)k^{*}-c\right]+\frac{1}{2}\frac{\partial^{2}V}{\partial a^{2}}(k\sigma)^{2} \qquad [2]$$

Let k/a and k^*/a be proportions of total capital invested in production and capital invested by foreigners on national wealth; then, $k=\left(\frac{k}{a}\right)a$ and $k^{*}=\left(\frac{k^{*}}{a}\right)a$. Further, let expected income be defined as $E(y)=f(k)+r^{*}(a-k+k^{*})-f'(k)k^{*}$. Now, from [2] we want to find the optimal rules of consumption and capital accumulation that maximize V_0. The solution is

$$\frac{k}{a}=\frac{\left[f'(k)-r^{*}\right]+\sqrt{\left[f'(k)-r^{*}\right]^{2}+4\theta\sigma^{2}\left[r^{*}\left(1+\frac{k^{*}}{a}\right)-\frac{k^{*}}{a}f'(k)\right]}}{2\theta\sigma^{2}} \qquad [3.a]$$

$$c=\underline{c}+\{0,\phi a+\psi[E(y)-\underline{c}]\} \qquad [3.b]$$

Where $\phi=\frac{\rho}{\theta}+\left(\frac{1-\theta}{2}\right)\left[\left(\frac{k}{a}\right)\sigma\right]^{2}$, and $\psi=-\left(\frac{1-\theta}{\theta}\right)$. The implications from the result [3.a] have been widely underlined. The amount of wealth individuals allocate to domestic capital declines with risk (σ) the higher the risk aversion (θ); and higher domestic returns to capital than the rate of return in the international markets $[f'(k)>r^{*}]$ attracts inflows of capital. If Sub-Saharan Africa is seen as a high-risk region and, according to Collier (1998), returns to capital in this region are lower than elsewhere, then it is not surprising that investment has registered rates as low as reported in the literature.

Three implications result from consumption function [3.a]. First, at each point of time consumption expenditures are financed by both wealth and income. If consumers behave according to this model, then it becomes clear why consumption tends to be highly responsive to income shocks, and why marginal propensity to save for income shocks in developing countries was found too low by Schmidt-Hebbel, Webb, and Corsetti (1992). Second, saving only occurs after minimum consumption requirements have been satisfied. And, third, uncertainty reduces consumption but its effects are through marginal propensity to consumption of wealth (ϕ):

$$\frac{\partial c}{\partial\sigma}=(1-\theta)a\sigma\left(\frac{k}{a}\right)^{2}<0$$

As wealth approaches zero, uncertainty becomes irrelevant in consumption decisions.

4.2 Wealth dynamics and sustainability

Minimum consumption requirements have another implication on wealth dynamics and sustainability. Imagine a negative shock reducing income by 1 as $E(c) \rightarrow \underline{c}$; consumers will run down their assets by an amount equivalent to the income shortfall. However, consumers only save $(1 - \psi) < 1$ of income windfall in the same magnitude. If these shocks are normally distributed, the saving function becomes asymmetrically distributed on the states of the nature. Dynamically, such an economy heads for wealth depletion.

Figure 1
Deterministic dynamics of wealth

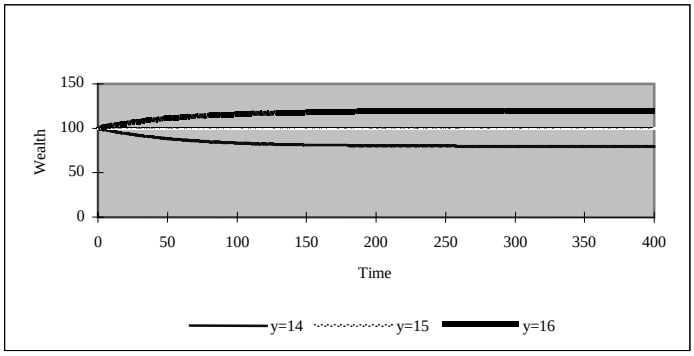


Figure 2
Wealth dynamics with income volatility

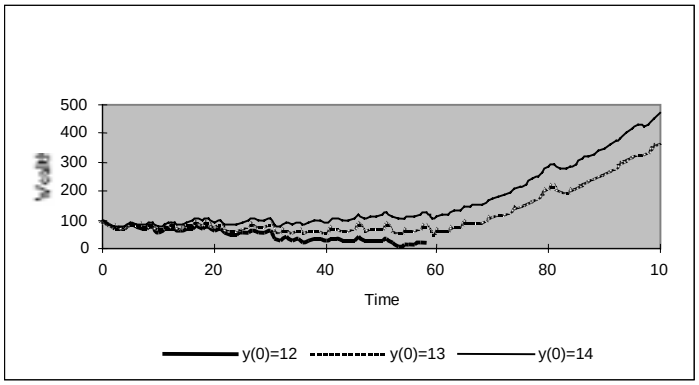
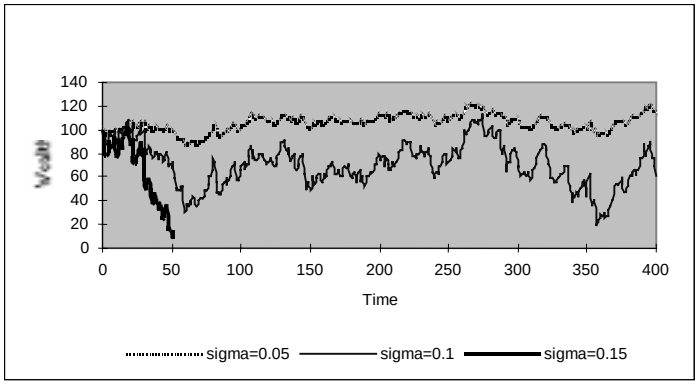


Figure 3
Growing income [Sigma=0.15]



Figures 1-3 provide a visualization of the wealth dynamics if consumption function takes the form [3.b]. Parameters were assumed to take the following values: $\rho = 0.05$, $\theta = 3$, $k(0) = 100$, and $a(0) = 100$. Figure 1 displays certainty-equivalent [$sigma(\sigma) = 0$] wealth dynamics if income remains constant. (Recall that in this model capital does not depreciate and population remains constant.) As the figure suggests, to the extent that wealth is positive the break-even level of income must be greater than c. With parameters assumed as given above, the level of income consistent with zero saving is $y = 15$ (the exact figure is $y = 15.01501$). Above this level (for example $y = 16$), saving is positive and wealth grows. Below $y = 15$ (as in the case $y = 14$), saving is negative and wealth declines. Random numbers were drawn from a $N(0,1)$ distribution and the results used to generate the dynamics displayed in Figures 2 and 3. In Figure 2 expected income remains at its break-even level [$E(y) = 15$], but the level of uncertainty varies. At a low level of uncertainty, wealth is relatively even, but at a high level of uncertainty, it not only becomes volatile, but is also quickly depleted. In Figure 3 it was assumed that income grows at 1 per cent in each period. In this case wealth tends to grow even if initial income is below the break-even level. However if initial income is too low (as in the case $y(0) = 12$) economic growth may not be enough to avert wealth depletion.

Most of the debt-overhang literature has focused on two-period models. In such models, creditors have no choice but to declare default in case of complete or partial failure to meet scheduled debt service. The story ends in the next period. When the planning horizon is long (especially if T remains far), failure to meet debt service at time t does not preclude the possibility of being able to meet debt service at time $t+\Delta t$ (Eaton, Gersovitz, and Stiglitz 1986). Assessment is necessary to establish whether the problem is one of liquidity or solvency. Liquidity problems may be solved by injection rather than declaring default. The model discussed in this section suggests that risk-averse lenders prefer economies that combine both high income and low risk, since a growing economy is moving income above the minimum consumption requirements may also be attractive. A small degree of uncertainty in a low-income country raises doubts about sustainability and its ability to repay its debts.

5 Conclusion

Uncertainty has deleterious effects on economic performance. Even when irreversibility and the option to wait are not assumed (as in the model discussed in section 4), risk aversion is sufficient for economic agents to refrain from allocating their resources in risky environments. Further, the model suggests that as consumption approaches survival levels, uncertainty induces the economies to run down their wealth, contrary to the theories suggesting that the poor, when faced with uncertainty, save more than the rich. Tentative analysis of Mozambican data shows that the levels and innovations of consumption and of income are positively and strongly correlated, and there is no sign of uncertainty inducing savings. In fact, current account of the balance of payments has not only remained negative but has also deteriorated over the last two decades. The positive correlation between current account and economic growth when both war and reforms are taken into account suggests that removing uncertainty and implementing policies that increase returns to capital are crucial for the long-term sustainability of the Mozambican economy. In the short run, the strong and negative correlation between domestic investment and the current account suggests that debt relief will substantially benefit

private investment by increasing the availability of foreign exchange and reducing the shadow cost of capital.

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Appendix: Economic and debt Dataset

(1000 million meticais, 1998 prices, unless otherwise specified)

Years	GDP	Private consumption	Gov't deficit	Gov't expenditures	Investment			Debt stock	Scheduled debt service	Actual debt service	Current account	Exports of goods and services	Population (millions)
					Private	Public	Total						
1979	24,823	20,107	-1,636	4,167	1,120	1,568	2,689	111	1,038	1,038	-2,378	1,925	11,7
1980	25,990	21,052	-1,815	5,131	1,367	1,949	3,316	3,805	1,064	1,064	-3,104	2,789	12,1
1981	26,118	20,633	-2,763	6,173	950	2,569	3,518	9,544	2,663	2,663	-3,584	3,544	12,4
1982	25,265	20,136	-2,325-	6,847	439	2,838	3,277	13,563	2,694	2,694	-3,982	2,769	12,7
1983	23,253	19,068	-3,767	6,747	-983	2,473	1,490	15,138	2,803	926	-3,322	1,957	13,1
1984	20,541	16,433	-3,210	6,390	-756	2,382	1,626	15,531	2,535	0	-2,883	1,294	13,3
1985	18,446	14,757	-1,980	3,824	328	647	975	11,653	1,592	150	-1,835	766	13,5
1986	18,834	14,257	-2,537	4,438	593	800	1,393	10,788	1,860	27	-2,127	677	13,6
1987	19,956	15,127	-2,869	4,945	3,461	2,120	5,582	35,219	4,812	443	-6,261	2,114	13,7
1988	21,264	16,161	-3,339	5,804	4,466	2,810	7,282	44,764	5,261	1,042	-7,819	2,760	13,8
1989	22,661	16,973	-3,549	6,233	4,900	3,079	8,004	51,738	5,675	770	-9,979	3,181	13,9
1990	22,927	16,049	-3,888	6,768	4,565	3,165	7,730	50,295	5,152	1,064	-8,995	3,032	14,2
1991	23,930	16,512	-3,693	6,924	5,670	3,360	9,030	66,598	7,127	1,387	-11,281	4,868	14,5
1992	25,478	17,325	-3,306	6,997	6,183	3,246	9,428	64,052	6,706	984	-10,850	4,641	14,8
1993	30,420	11,294	-3,947	7,516	6,758	3,576	10,333	85,999	8,636	1,910	-14,475	6,411	15,1
1994	31,407	23,336	-4,904	7,812	4,965	3,447	8,412	65,732	5,843	1,074	-12,631	4,436	15,5
1995	32,811	22,771	-3,335	6,263	5,163	3,039	8,201	69,767	5,522	1,462	-9,514	5,325	15,8
1996	35,536	23,880	-3,439	7,073	6,411	3,328	9,739	67,131	4,164	1,547	-9,453	5,651	16,2
1997	40,075	25,167	-4,809	9,618	5,726	3,206	8,932	64,631	3,781	1,108	-6,970	5,877	16,5
1998	46,134	27,004	-4,923	10,149	4,883	4,528	9,411	75,689	5,195	1,303	-9,181	7,136	16,9
1999	50,286	28,490	-6,131	12,069	12,395	5,456	17,852	24,672	1,315	1,165	-13,285	7,516	17,3

Source: Compiled and adjusted by Gode (2000) from publications of Bank of Mozambique, government of Mozambique, IMF, and World Bank