FINANCING ECONOMIC GROWTH AND DEVELOPMENT

IN JAMAICA: 1960 - 1992

by

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To Cecilia, whose love and support in this undertaking can never be adequately recompensed, and to André and Rafael who will no longer have to endure my prolonged absences.

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ABSTRACT

This thesis analyses the financing of economic growth and development in Jamaica during the period 1960-1992. In so doing, sources of both domestic and foreign finance are considered. Three main questions are examined. Firstly, the effects of financial variables and financial liberalisation on the real economy are analysed and the predictions of financial liberalisation models evaluated. Secondly, the impact of external debt on domestic savings, investment and growth and the question of whether or not debt accumulation destabilizes the balance of payments, are considered. Thirdly, the effects of foreign capital inflows and outflows including capital flight, on the domestic economy as well as the extent to which economic growth is constrained by the balance of payments, are examined.

Chapter one deals with the financial and economic performance of Jamaica between 1960 and 1992. Three sub-periods are identified: the years of steady growth from 1960 to 1972; the period of prolonged crisis between 1973 and 1980, and the years of faltering recovery, 1981-1992. The social and economic policies of the various political administrations which governed Jamaica, as well as the role of the IMF and World Bank are explored in identifying some of the root causes of Jamaica's economic situation.

Chapter two examines the theory of financial liberalisation, the main hypotheses of which are tested in chapters three and four. Chapter three analyses the role of the real interest rate, the effect of reserve requirements on credit availability, and the impact of financial deepening on savings, investment and growth in Jamaica. Chapter four considers the effects of inflation on real and financial variables and the effects of government expansion on private sector access to bank resources, private investment and economic growth

The net effect of capital inflows on economic growth, taking into account capital outflows, is considered in chapter five, as is the effect of capital flows on saving and investment. Chapter six considers the question of whether long run growth is constrained by the balance of payments, and finds that Jamaica's long run growth rate is in fact that rate of growth consistent with balance of payments equilibrium on current account.

The relevant theoretical and empirical literature pertaining to the various issues analysed, is briefly explored in each chapter before presenting the evidence on Jamaica. Chapter seven summarises and concludes the main findings of the thesis.

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INTRODUCTION

This thesis examines the financing of Jamaica's economic growth between 1960 and 1992, including the role of both domestic and external financing. Three main questions are examined. Firstly, the impact of domestic financial variables such as the real interest rate and the reserve requirement on real variables such as real saving, investment and growth, is considered. Secondly, the effect of external debt accumulation on domestic savings, investment, growth and the stability of the balance of payments, is examined. Thirdly, the effects of foreign capital flows and the balance of payments constraint on domestic economic activity are analysed.

The effects of domestic and foreign capital on the real economy are examined against the backdrop of the government's financial and economic policy over the three decades. That policy often had much in common with the view that financial liberalisation (e.g. raising interest rates and removing reserve requirements on bank deposits) increases savings, investment and growth.

The economic fortunes of Jamaica over the period of this study were bound up with the impact of the political changes that occurred and with the social and economic philosophy of the government of the day. The election of a left-wing government in 1972 led to inward-looking policies and an emphasis on income re-distribution and self-reliance for the rest of the decade. Jamaica fared little better under the often inconsistent policies of the right-wing government which came to power in 1980 and which lasted up to 1989. Jamaica became heavily indebted to the IMF during the latter half of the 1970s and first half of the 1980s, under both administrations. It was not until the closing years of the 1980s that both left and right-wing governments seemed to have begun to learn the lessons of the chaotic years of the 1970s and 1980s, and began to adopt outward-looking policies.

Chapter One describes the financial system and economy of Jamaica between 1960 and 1992. The financial and economic structure are examined, as are financial and economic policies and the performance of the economy over the three decades. The identification of three sub-periods provides a useful framework within which to conduct the analysis. They are: the years of steady growth 1960-1972; the period of prolonged crisis 1973-1980; and the "stop-go" period of 1981-1992.

The steady growth, low inflation, and high savings and investment levels of the 1960-1972 period are analysed against the backdrop of the government's economic objectives and

policies. The main objectives of economic policy were: to generate "development" by encouraging foreign saving and exports; to generate domestic saving and non-inflationary finance for development by maintaining steady real growth and to protect the balance of payments by shadowing the exchange rates of Jamaica's main trading partners and by making nominal interest rates attractive to foreign capital. Credit controls, foreign exchange taxes and exchange control were introduced to protect the external account, but the controls were not onerous and restrictions on foreign capital were minimal. The focus of the government's capital programme was investment in the country's physical infrastructure to support private sector development.

The impact of a change in government in 1972 and the ensuing policy shift over the 1973-1980 period, is also analysed. It was a period of high public spending, declining savings and investment and zero or negative real growth rates. The main economic objectives of the new left-wing government were reducing unemployment and income inequality, increasing national (i.e. public sector) ownership and control, and attaining self sufficiency in production. There was a pro-nationalisation stance and anti-foreign rhetoric, and extensive price import and exchange controls were introduced.

The brief recovery, stagflation and the second recovery of the 1980-1992 period are also examined in Chapter One. The main economic objectives of the new regime that was elected in 1980 and which remained in power until 1989, were the restoration of balance of payments stability and the generation of economic growth after the long years of decline.

The chapter examines the interplay between economic policies and performance in each of the sub-periods. The circumstances under which Jamaica was forced to borrow from the IMF in the late 1970s and the 1980s and the impact of the IMF supported programmes are also considered.

Chapter Two provides a survey of the literature on financial liberalisation, starting with a summary of early contributions to the debate on the importance of the financial system to economic development. Much of the early work surveyed follows the supply-leading approach which holds that prior-savings and therefore a well developed financial system are necessary for investment and growth. In the alternative demand-following approach it is the investment-generated growth in real output that causes the financial system to develop and respond to the

demands placed upon it. In general the early researchers stress the importance of financial organisation and appropriate financial institutions in fostering growth and development.

The greater part of the second chapter analyses the specific proposition of McKinnon (1973) and Shaw (1973) that financial repression retards economic growth and financial liberalisation promotes growth, as well as examining other post-1973 theories. The basic McKinnon-Shaw hypothesis that raising the real interest rate increases saving and investment and promotes growth, is analysed along with dynamic and open-economy extensions of their model (Kapur 1976, 1983; Mathieson 1979, 1980; Galbis 1977).

Chapter Two also examines the Neo-Structuralist models which possess some Keynesian adjustment mechanisms, but which are similar to the McKinnon-Shaw models in their assumption that prior-savings are needed for investment. Informal financial markets are of paramount importance in Neo-Structural models (Taylor 1983; Van Wijnbergen 1983a and 1983b; and Buffie 1984). They find that financial liberalisation may lead to stagflation if higher interest rates simply divert savings away from the informal market to the formal market. However, this may not be the case if the assumption of such models that credit supplied in the informal market is used overwhelmingly for capital purposes, does not hold.

The post Keynesian approach (Burkett and Dutt 1991; Dutt 1991), assumes that prior-savings are unnecessary for investment. It is investment and effective demand that determine savings, via the effect of the multiplier on output and income (on which aggregate saving depends), or via the re-distribution of income among different classes with varying saving propensities. The effect of a rise in the deposit interest rate is complex and depends on the relative strengths of various effects. On the one hand there is the possible positive effect on output via financial savings, investment and the profit rate. On the other there is the possible negative effect on output via the propensity to save (which affects consumption and aggregate demand) and via the sensitivity of expectations to any decline in the profit rate.

Finally, the second chapter examines from a micro-economic perspective, some of the institutional aspects of financial markets, possible reasons for market failure and instability, and situations under which financial liberalisation may not work.

Chapter Three examines recent empirical evidence on the relationship between financial liberalisation and economic growth in various countries, and presents the empirical results for

Jamaica. The international evidence focuses on one or more aspects of the transmission mechanism linking financial conditions and growth: the link between the real deposit interest rate and savings; the link between the availability and cost of credit on the one hand and the quantity and efficiency of investment on the other and the direct relationship between liberalisation and growth.

The empirical evidence for Jamaica is then analysed. The determinants of total saving, financial saving, domestic investment and economic growth are examined. The emphasis is on measuring the impact of financial conditions on those variables and in turn exploring the determinants of financial variables where appropriate. The effect of the real interest rate on saving, investment and growth is given particular attention.

In addition, several related hypotheses of the financial liberalisation school are examined. The first is Shaw's (1973) proposition that financial deepening, the growth in financial relative to non financial assets, leads to higher real saving. The second one tested is the hypothesis held by both the McKinnon-Shaw school (Kapur 1976, Mathieson 1979 & 1980) and the Neo-Structuralists (Taylor 1983, Van Wijnbergen 1983a and 1983b, Buffie 1984) that required reserve ratios on deposit liabilities tax the banking system and reduce the amount of credit available for investment. The third hypothesis analysed is the proposition that higher real interest rates lead to higher investment by improving the availability and cost of credit. In that regard, McKinnon's (1973) complementarity hypothesis that money and capital complement one another, ie that prior savings must be accumulated to finance investment and that higher interest rates increase savings and investment, is considered. The alternative Keynesian proposition that investment is demand determined is examined. McKinnon's Virtuous Circle model in which saving and growth have a mutual beneficial effect on one another, is tested. In particular the positive Portfolio Effect of growth on the propensity to save is examined.

Chapter Four considers the role of inflation in fiinancial liberalisation models, and its impact on growth. Inflation in financial liberalisation models rises with excess money supply. Typically in such models, financial liberalisation raises the real interest rate and the demand for money relative to its supply, and lowers the inflation rate.

In structuralist/post-Keynesian models, money is a mechanism through which inflation is propagated, but money itself is not seen as a cause of inflation. Rigidities in the government,

foreign trade, agricultural and financial sectors are viewed as the primary generators of inflationary pressures. If this view is correct, monetary policy will have no permanent effect on inflation without appropriate structural changes to the economy.

This chapter also examines the financial liberalisation contention that inflation lowers financial savings and reduces the amount of credit available for investment. In addition, the argument that inflation widens the budget deficit and crowds out private sector borrowing from the banking system, is considered. Whether or not private investment is physically crowded out is also examined, as is the assumption of the financial liberalisation theories that the productivity of private investment is higher than that of public investment.

Chapter five looks at the effect of foreign capital flows and the stock of foreign debt on savings, investment and economic growth. If capital inflows are used entirely for investment, then they may have a positive impact on savings. On the other hand if foreign capital is partly consumed, then it may lower savings by encouraging consumption.

Not only is the effect of total capital inflows on domestic economic aggregates considered, but so is the effect of components of total inflows. In particular, capital inflows are disaggregated into public and private flows, which are further disaggregated into government borrowing and government grants for public flows, and foreign direct investment, private grants, and other capital for private flows. In addition, the net effect of capital flows on savings, investment and growth is considered. The concept of the net transfer of resources is employed to determine the overall effect of capital flows on domestic aggregates (see Bocha, 1992 and Thirlwall, 1994).

This chapter also considers the question of whether or not the stock of foreign debt has any effect on savings, investment and growth. Fry (1995) argues that low levels of foreign debt encourage savings, investment and growth, while the opposite effect is engendered by high stocks of foreign debt. In addition, Fry's (1995) argument that the stock of foreign debt might be destabilising, that is it might persistently worsen the balance of payments if it causes domestic savings to contract more than investment, or investment to grow faster than savings, is examined.

Chapter Six examines the extent to which economic growth in Jamaica is constrained by the balance of payments. Thirlwall's (1979) hypothesis is that a country's long-run growth

rate cannont exceed that rate consistent with balance of payments equilibrium on current account. The model predicts that long-run growth is determined by the ratio of a country's export growth rate to its income elasticity of demand for imports (see Thirlwall, 1979 and Thirlwall and Hussain, 1982, the latter of which incorporates capital flows). In addition, the question of whether long-run growth is driven primarily by export growth or by the growth of external capital inflows, is considered. Chapter Seven summarises and concludes the major findings of the thesis.

The principal data sources used are: the International Monetary Fund's (1960-1995) International Financial Statistics; The International Monetary Fund electronic databank (1960-1990); the Government of Jamaica's (1960-1992) Economic and Social Survey of Jamaica; the Bank of Jamaica (1985); the World Bank's (1976, 1987, 1988/9, and 1993) World Tables; and the World Bank's (1986/7 - 1993/4) World Debt Tables.

The quality of economic data is usually of some concern in research on developing countries, and this is no less so for Jamaica. There are inconsistencies among the various data sources, particularly between the IMF and the Government of Jamaica data for the decade of the 1960s. The two series are more consistent in later years as Jamaica received technical assistance from the IMF and World Bank in statistical gathering, compilation and reporting along IMF/IBRD lines, and as the IMF and the reporting authorities in Jamaica improved their understanding of the social and economic structure of Jamaica. The IMFs International Financial Statistics contained the most consistent financial and macroeconomic data, and was the main source used, but it was supplemented by data from the Government's Economic and Social Survey where necessary.

In addition, the performance of the economy of Jamaica was markedly different during the three sub-periods identified above. Various governments with dissimilar ideologies pursued different policies which in turn produced quite different results. The Chow stability test is used throughout the thesis to ensure that the parameters of the various models employed are stable. Other econometric techniques used, are described in each chapter.

CHAPTER 1

THE ECONOMY OF JAMAICA, 1960-1992

1.1 Introduction

This chapter provides an analysis of the economy of Jamaica and its performance over the three decades spanning the period 1960-1992, with particular emphasis on financial developments. In analysing the latter, attention is focused on the monetary and financial system and the principal financial indicators, as well as on monetary and financial policy. Subsequent chapters examine financial variables and policy in the context of the financial liberalisation hypothesis.

Three distinct sub-periods can be discerned within the 1960-1992 period: the years of high growth, 1960-1972; the period of prolonged crisis, 1973-1980; and the period of Intermittent Recovery, 1981-1992. During the first sub-period, real growth averaged 5.2 per cent and was achieved without running into balance of payments problems. However, this sub-period is important not only because of the emergence of Jamaica from its post-colonial era as a rapidly growing, stable democracy. It is also important because the difficulties and crises that emerged in subsequent years had, to some extent, their roots in the 1960s.

The second sub-period, 1973-1980, is characterised by negative economic growth for every year except 1973 and 1978, high inflation, growing and unsustainable government deficits and balance of payments problems. The government was also obliged to enter into Standby and Extended Fund agreements with the IMF, in an attempt to redress the imbalances on its external and domestic accounts and to restore confidence in the economy. It is no accident that Jamaica experienced severe social and political unrest during those years.

During the third sub-period, 1981-1992, the economic fortunes of Jamaica fluctuated, as erratic and sometimes conflicting policies led to a short-lived recovery followed by vigorous adjustment measures and generally depressed conditions, and followed again by another tentative recovery. This period also tells the story of two approaches of IMF supported

adjustment: the gradual, flexible, moderately-paced approach, and the "heavy-handed", inflexible, rapid-adjustment approach.

In general, the comparatively steady growth and economic stability of the 1960-1972 period embracing laissez-faire policies, was brought to an abrupt end by a combination of domestic policies and external economic shocks. In addition, economic decline was exacerbated by an inward-looking strategy exemplified by import-substitution policies, right up to the latter part of the 1980s. It is only towards the end of that decade and the beginning of the 1990s that consistent outward-oriented strategies combined with economic liberalisation have been consciously implemented. Their effectiveness will be examined later on.

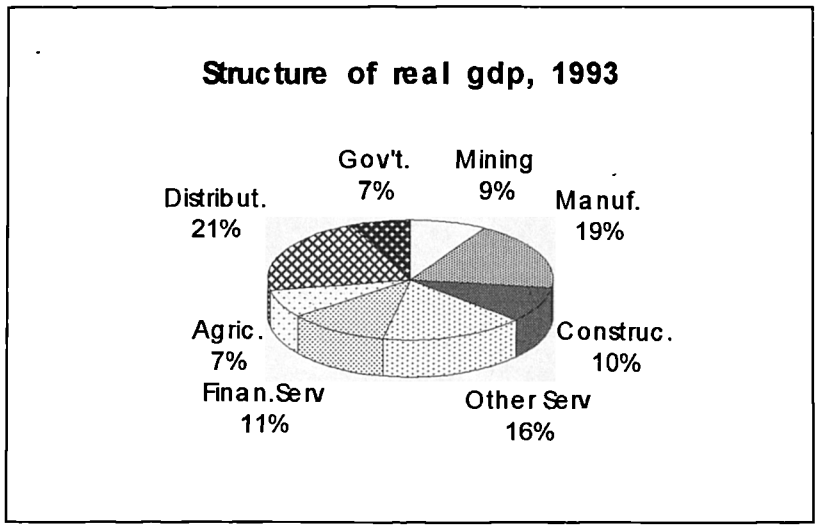
1.2 Overall Financial and Economic Structure and Performance

Jamaica, the third largest island in the Caribbean, has an area of 11,000 square kilometres and a population of 2.47 million growing at around 1 per cent per annum. The labour force is well educated and skilled, and the country is well endowed with natural resources.[1] Its 1992 per capita GNP was approximately US$ 1,340, with its principal economic activities being tourism, manufacturing, agriculture, and the mining and processing of bauxite/alumina. Agriculture accounts for about 7.4 per cent of GDP, bauxite/alumina 8.7 per cent, manufacturing 18.5 per cent, and services 67.6 per cent (with financial services contributing about 11.4 per cent).[2]

[1] World Bank (1994), Trends in Developing Economies, 1994, IBRD, Washington D.C, p.239.

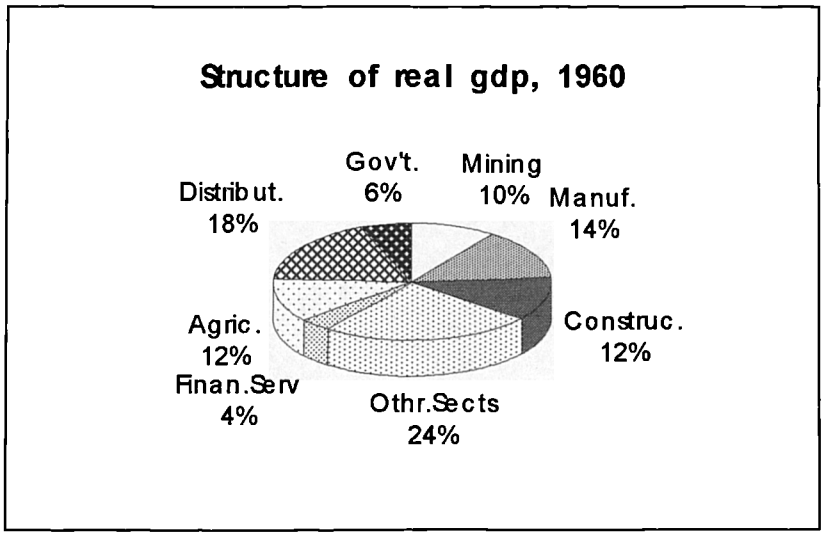
[2] Economic and Social Survey, Jamaica, 1992, Section 1.1.

FIGURE 1.1



Source: World Bank (1994)

FIGURE 1.2



Source: Boyd (1988)

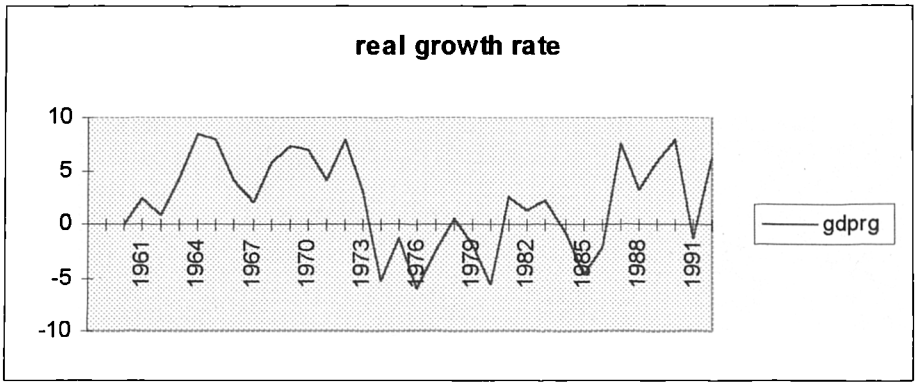
A comparison of figures (1.1) and (1.2) indicates the relative growth in importance of the financial sector from 4 per cent of GDP in 1960, to 11.4 per cent in 1993, and of manufacturing from 14 per cent to 18.5 per cent. The depicted decline of agriculture (from 12 per cent to 7.4 per cent) and mining (from 10 per cent to 8.8 per cent), does not tell the full story. Agriculture declined to 5.9 per cent in 1989 before recovering to 7.4 per cent in 1993 as a result of the export promotion policies of the government, while mining peaked at 13 per cent in 1974, then declined to 5 per cent in 1985 before recovering to 8.8 per cent in 1993. Section 1.4 below and subsequent sections, examine the underlying reasons for these changes in the

case of the bauxite industry (i.e, the mining sector). The strength of the bauxite sector had important implications for investment, export earnings, capital flows, the government deficit and growth during the 1960-1992 period.

Jamaica's historical ties with the UK continued to influence its trade and financial arrangements (i.e, its currency and monetary policy), especially during the 1960's, despite its proximity to the USA. Even today, its history and geographic attributes continue to influence its economic structure. Imports and exports were each around 70 per cent of GDP in 1992, and given its size, openness and dependence on foreign markets, Jamaica is inescapably sensitive to changes in the external economic environment.

The strong economic growth of the 1960-72 period shown on figure 1.3, was fuelled by bauxite/alumina exports, tourism, and substantial capital inflows invested in the bauxite industry. The decline of bauxite production from 10 per cent of GDP in 1960 to 6 per cent in 1976[3], the drastic reduction in capital inflows and the large government deficits, all contributed to the unprecedented negative growth rates during the 1973-80 period.

FIGURE 1.3



Source: International Monetary Fund (1960-1995)

In an effort to reverse the economic contraction, the government negotiated Stand-By/Extended Fund agreements with the IMF four times between 1977 and 1980. For the most part it failed the IMF performance tests and the period was characterised by high inflation and shrinking real incomes.

There was a brief recovery between 1981 and 1983, during which the new conservative government, elected in 1980, managed to restore some semblance of business confidence.

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[3] Boyd, pp 6-7.

Official capital inflows improved under the various IMF Agreements as shown on Table 1.1, and economic growth was positive for only the second time in eight years. Table 1.1 gives some basic data on Jamaica, including: real growth; inflation; ratios of savings, investment and the government deficit to GDP; the velocity of broad monetary liabilities; the nominal bilateral exchange rate of the Jamaica dollar to the U.S dollar and capital inflows from governments and international organisations (mainly the IMF and the World Bank.) However, inflation was not brought under control and substantial borrowing from international institutions laid the foundation for debt problems later on.

TABLE 1.1

	GDPR	gdprg	cpi	pcpi	e	gdefy	LLvel	SY	IY	gov't k-infl
	J$m	%	index	%	J$/us$	%	%	%	%	us$m
1960	74.06	.	5.63	.	0.71	1.01	4.65	27.38	21.94	1.8
1961	75.82	2.37	6	6.57	0.71	2.13	5.40	29.23	20.87	3.8
1962	76.52	0.92	6.09	1.50	0.71	2.44	4.22	27.46	19.7	0.5
1963	79.86	4.36	6.2	1.81	0.71	2.09	3.94	27.19	17.89	14
1964	86.62	8.47	6.32	1.94	0.71	2.56	3.75	22.95	20.54	0.1
1965	93.53	7.98	6.49	2.69	0.71	2.44	3.76	25.03	20.28	2
1966	97.32	4.06	6.61	1.85	0.71	2.69	3.56	33.57	22	2.6
1967	99.33	2.06	6.81	3.03	0.72	3.13	3.5	31.81	23.76	4.6
1968	105.13	5.83	7.21	5.87	0.83	3.67	3.01	32.68	28.05	12.8
1969	112.84	7.34	7.67	6.38	0.83	2.06	3.06	28.5	35.15	15.8
1970	120.72	6.98	8.8	14.73	0.83	2.71	2.98	27.33	31.51	4.4
1971	125.69	4.11	9.27	5.34	0.83	3.73	2.61	24.96	32.14	12
1972	135.75	8.01	9.77	5.39	0.77	4.13	2.48	19.04	27.38	11.7
1973	139.84	3.01	11.5	17.71	0.91	5.26	2.58	21.92	31.51	36.4
1974	132.45	-5.28	14.62	27.13	0.91	7.78	2.49	14.08	24.32	98.2
1975	130.70	-1.32	17.16	17.37	0.91	7.92	2.70	15.42	25.76	122.9
1976	122.82	-6.03	18.84	9.79	0.91	15.48	2.62	9.36	18.17	60.9
1977	119.84	-2.43	20.95	11.20	0.91	14.47	2.59	13.58	12.23	47.2
1978	120.55	0.59	28.27	34.94	1.41	16.67	2.77	18.22	14.99	71.6
1979	118.26	-1.89	36.48	29.04	1.76	15.28	2.79	18.33	19.15	62.9
1980	111.52	-5.70	46.45	27.33	1.78	20.66	2.59	15.76	15.9	190.5
1981	114.38	2.56	52.37	12.74	1.78	16.49	2.25	11.57	20.29	72.5
1982	115.95	1.38	55.79	6.53	1.78	15.28	1.95	10.07	20.88	263.7
1983	118.53	2.22	62.26	11.60	1.93	13.46	1.79	14.76	22.25	138.4
1984	117.55	-0.83	79.57	27.80	3.94	13.75	1.99	16.68	23.12	455.5
1985	112.03	-4.69	100	25.68	5.56	17.87	1.87	14.84	25.32	150
1986	109.66	-2.12	115.11	15.11	5.48	9.36	1.83	22.87	18.52	-156.1
1987	117.99	7.60	122.76	6.65	5.49	.	1.88	25.73	22.25	211.3
1988	121.68	3.12	132.91	8.27	5.49	.	1.63	27.31	25.72	35.5
1989	128.85	5.90	151.96	14.33	5.74	.	1.79	16.06	28.65	191.8
1990	138.98	7.86	185.33	21.96	7.18	.	1.96	18.53	27.97	69.9
1991	137.20	-1.28	280	51.08	12.12	.	1.90	19.4	28.59	10.6
1992	145.64	6.15	495.93	77.12	22.96	.	1.81	20.6	28.61	-65.7

Source: International Monetary Fund (1960 - 1995); Government of Jamaica (1960 - 1992);

In Table 1.1: (GDPR) represents real gross domestic product and (gdprg) is the growth rate of (GDPR); (cpi) is the consumer price index while (pcpi) is its growth rate; (e) is the nominal bilateral exchange rate measured as Jamaica dollars per US dollar; (gdefy) is the government deficit as a percent of gross domestic product; (LLvel) represents the velocity of circulation of liquid liabilities in the economy, calculated as gross domestic product divided by liquid liabilities; (SY) and (IY) are savings and investment respectively as percentages of gross domestic product, while the last column shows the value of public sector capital inflows.

The recovery did not last and a strong IMF adjustment package (including substantial currency devaluation as indicated in table 1) was implemented in 1984, the aftermath of which was stagflation from 1984 to 1986. An outward-looking strategy involving export promotion resulted in positive growth in the closing years of the 1980s and the early years of the 1990s, with the exception of 1991 when growth was negative and inflation reached unprecedented levels, casting doubt on the sustainability of the recovery. The strong growth performance came despite the widespread destruction caused by Hurricane Gilbert in September, 1988, which put severe pressure on the government budget and on domestic resources in general. External capital inflows in the form of grants and the settlement of insurance claims helped to finance the reconstruction effort. High inflation, particularly in 1991 and 1992, was associated with substantial currency devaluations in those years (see Table 1.1), under yet another IMF programme signed in 1990. Stringent expenditure control measures and tough controls on money and credit contributed to negative growth in 1991, but did not contain inflation.

The secular decline in the income velocity of broad money from 4.65 in 1960 to 1.81 in 1992 (see Table 1.1), is an indication of a declining efficiency in the use of the liquid resources of the economy as a whole. This is partly a result of the poor growth performance between the mid 1970s and the mid 1980s. In general, increasing amounts of nominal liquidity are associated with sluggish or even contracting aggregate output. The next sub-section examines financial variables and their relationship to the macro-economy in greater detail.

1.2.1 The Financial Sector

Jamaica's financial institutions comprise: the Bank of Jamaica, the country's Central Bank; ten commercial banks (which are British, Canadian, American, or locally owned) with combined assets in 1993 of J$62.3 billion; twenty-two merchant banks with assets of J$10.9 billion; seven finance houses/trust companies with assets of J$477 million; ten building

societies with assets worth J$1.8 billion; and a national insurance fund with assets of J$3.1 billion (1991). Current data on insurance and private pension funds are unavailable (the assets of the former were estimated to be around J$1 billion in 1985).

The World Bank[4] describes Jamaica as having a well-developed financial system. Goldsmith (1955, 1966, 1968) develops various ratios to measure financial development, most of which make use of the notion of national wealth or national assets (both real and financial). Since the measurement of those stocks is not available for Jamaica, another ratio suggested by Goldsmith as an indicator of a country's monetary and financial development will be examined, that is, the share of money in the assets/liabilities of financial intermediaries.

Gurley and Shaw (1960) describe three broad stages through which countries pass (see Chapter 2). In the first stage, financial intermediation is undeveloped and money is predominantly of the 'outside' variety.[5] In the second stage, financial intermediation and inside money (ie money backed by debt-creating assets) assume greater importance, and the economy experiences greater financial innovation and an increase in the variety of financial institutions. The third stage is characterised by the provision of a wide variety of financial instruments by both intermediaries and centralised financial markets (eg stock markets). Towards the end of the second stage and during the early part of the third stage, the share of the monetary sector can be expected to decline somewhat, as other intermediaries proliferate.

Money[6] as a per cent of liquid liabilities of the financial system was steady in real terms, at around 50 per cent for the first few years of the 1960's, but had declined to 35 per cent by 1991. Commercial banks had already been established in the financial system by the 1960s, so their share of financial assets showed little growth though they dominated the system. Indeed, as the plurality of financial institutions and the complexity of the financial system grew over the three decades, the share of the monetary sector in financial assets declined. To the multiplicity of types of institutions described in the opening paragraph of this sub-section, must be added a stock market with a 1993 trading volume of J$8.4 billion and new capital raised of J$2.3 billion (the secondary function being predominant).

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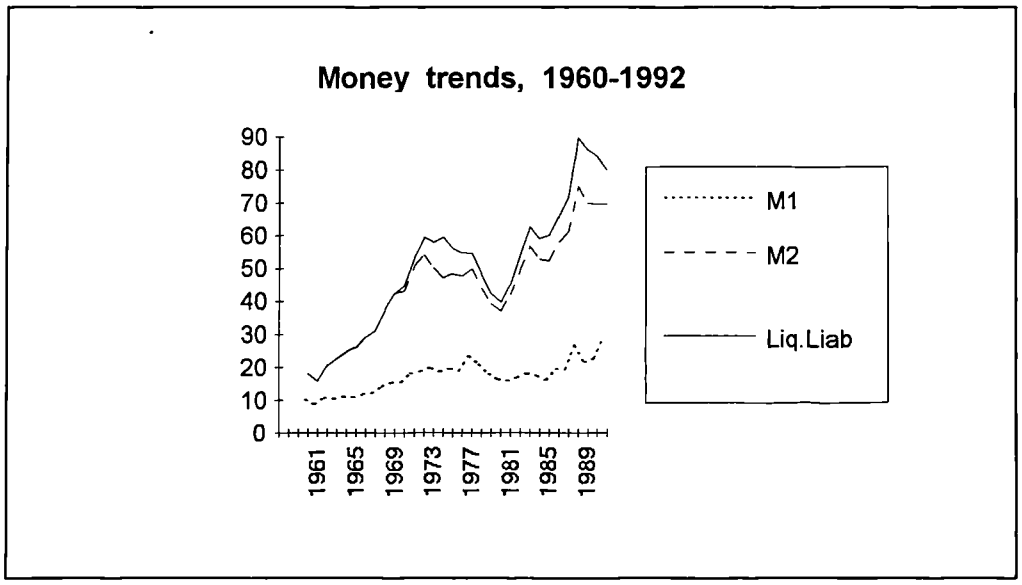
[4] Trends in Developing Economies, 1994, p 239.

[5] That is money not backed by debt-creating assets.

[6] narrowly defined as M1 = currency with the public plus demand deposits of the banking system.

FIGURE 1.4



Source: International Monetary Fund (1960 - 1995)

Figure 1.4 shows the growth of M1, M2[7] and Liquid Liabilities[8] of the financial system in real terms, between 1960 and 1992. The gap between M1 on the one hand and M2 and Liquid Liabilities on the other, widens progressively as the complexity of the financial system grows. The glaring exception is the 1973-80 period of crisis, in which private sector confidence was severely shaken, resulting in a decline in saving and time deposits of the banks and the non-bank intermediaries. It is also interesting that Liquid Liabilities and Money (broadly defined) are virtually indistinguishable up to 1970, with both growing faster than narrow money. This indicates that the banks maintained their relative dominance of the financial system, but generated financial growth by expanding their non-monetary (or alternatively, broader monetary) assets. Liquid Liabilities grew faster than broad money after 1972, despite the crisis in business confidence. This can be accounted for by the emergence and growth of government financial institutions aimed at supporting the social programmes of the new left-of-centre government.

1.2.1.1 Interest Rates and Financial Savings, 1960-1992

Table 1.2 shows the movement of the real deposit interest rate, liquid liabilities and real financial savings over the period 1960 - 1992.

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[7] M2 = M1 plus time, savings and foreign currency deposits of the banking system.

[8] Liquid Liabilities = M2 plus time and savings deposits of the finance houses, trust companies, building societies and other financial intermediaries.

Real deposit interest rates were positive or hovered around zero for most of the 1960-1972 period, except for 1961 and 1970 when they were sharply negative as a result of relatively high inflation in those years.

TABLE 1.2

	id	pcpi	real r	Liq. Liab	Fin. Sav.	
	%	%	%	J$million	J$million	
1960	2.7	.		18.12		
1961	3.8	6.57	-2.77	15.67	-6.23	
1962	5	1.50	3.50	20.53	2.61	
1963	4	1.81	2.19	22.9	3.53	
1964	4.5	1.94	2.56	24.84	1.66	
1965	4.5	2.69	1.81	26.04	3.31	
1966	5	1.85	3.15	29.35	3.33	
1967	5	3.03	1.97	31.28	2.31	
1968	4.5	5.87	-1.37	37.73	7.32	
1969	5	6.38	-1.38	42.37	5.75	
1970	8	14.73	-6.73	44.66	5.51	
1971	6	5.34	0.66	53.07	6.88	
1972	4.5	5.39	-0.89	59.47	6.56	
1973	8.3	17.71	-9.41	58	3.52	
1974	10.5	27.13	-16.63	59.37	14.66	
1975	9	17.37	-8.37	56.06	0.8	
1976	11.55	9.79	1.76	54.67	7.18	
1977	11.69	11.20	0.49	54.65	-5.18	
1978	10.46	34.94	-24.48	47.86	2.86	
1979	8.91	29.04	-20.13	42.16	6.7	
1980	10.29	27.33	-17.04	39.66	10.9	
1981	11.56	12.74	-1.18	45.03	5.82	
1982	9.61	6.53	3.08	54.04	11.86	
1983	13.06	11.60	1.46	62.59	13.42	
1984	15.58	27.80	-12.22	58.97	11.81	
1985	21.31	25.68	-4.37	59.97	16.59	
1986	19.02	15.11	3.91	65.84	12.74	
1987	17.5	6.65	10.85	72.17	13.37	
1988	17.92	8.27	9.65	89.61	25.28	
1989	19.04	14.33	4.71	85.88	15.02	
1990	26	21.96	4.04	83.97	19.52	
1991	27.40	51.08	-23.68	79.78	10.44	
1992	38.42	77.12	-38.70	80.67	2.81	

Source: International Monetary Fund (1960 - 1995)

Where: id is the nominal deposit interest rate & r is the real rate (defined in chapter 3)

pcpi is the inflation rate based on the consumer price index

Fin.Sav.is real financial saving (defined in chap 3) & Liq.Liab=liquid liabilities

Nominal deposit rates during the period 1960-1972 were fairly steady, averaging 4.8 per cent. The stated interest rate policy was to protect the balance of payments, since the economy was highly dependent on trade and foreign capital inflows. There was a tendency to shadow the interest and exchange rate policies of the UK, irrespective of the domestic monetary situation. The one exception was 1970 when the interest rate was raised by 60 per cent, ostensibly to combat inflation.

The trend of real financial saving was generally positive over the sub-period 1960-1972. With moderate inflation, real monetary liabilities grew steadily. As shown on Table 1.1, the savings ratio fluctuated from year to year between 1960 and 1972. The determinants of savings will be examined in chapter three, where the relative influence of income and interest rates in relation to the Keynesian and Neoclassical perspectives will be analysed.

The behaviour of key financial and economic variables was markedly different between 1973 and 1980. Despite consistently higher interest rates on nominal deposits, real deposit rates were sharply negative or virtually zero over the sub-period (see Table 1.2). This can be accounted for by a sharp rise in average inflation as a result of the oil shocks of 1973 and 1979 as well as the effects of a lax fiscal stance which was at odds with the attempts to tackle inflation by raising nominal rates to an average of two and a half times their level in the 1960-1972 period. The fiscal deficit increased in unprecedented fashion from an average of 2.7 per cent of GDP between 1960 and 1972, to an average of 12.9 per cent of GDP between 1973 and 1980.

Real financial savings fluctuated between 1973 and 1980, and its erratic behaviour probably reflects the uncertainty caused by inflation and its effect on the real interest rate, and the actions of an interventionist government on the interest rate (see section 1.4). As table 1.2 shows, overall real liquidity declined markedly by 33 per cent between 1972 and 1980.

The 1981-92 period is characterised by two episodes of recovery at the beginning and end of the decade, separated by a three year period of severe depression from 1984-1986. Inconsistent policies, heavy-handedness in their application, failure to restructure the real economy and the inflexible nature of the 1984 IMF programme probably lie at the heart of the slump.

Over 1981-83, the government deficit was cut from 21 per cent of GDP in 1980 to an average of 15 per cent in real terms. Inflation fell from 27 per cent in 1980 to 6.5 per cent in 1982, its lowest level for a decade, and capital inflows improved as a result of IMF loans. Real growth averaged 2 per cent compared to minus 5.7 per cent in 1980. The real deposit rate became positive and real financial savings showed significant growth. However, in order to stimulate the growth rate of the economy which was considered to be too low, the Jamaica dollar was devalued by around 8.4 per cent in 1983 with further devaluations of 104 per cent and 41 per cent in 1984 and 1985 respectively. High inflation returned, averaging 23 per cent over the next three years 1984-1986, business confidence was badly affected and the real growth rate once again became negative (see figure 1.3). The real deposit rate again became negative and real financial savings declined. The economy once again showed signs of developing the crisis symptoms of the 1970s and the policy response was to impose tighter restrictions on the financial sector including more stringent credit controls, higher liquid asset ratios on commercial banks and higher Central Bank discount rates. The government failed the various IMF tests, leading to the abandonment of the IMF programme.

From 1987 to 1992 there was a determined policy shift, despite the change in government in 1989 which restored the Socialist party to power, with both the economy as a whole and the financial system being systematically liberalised. Although the real growth rate rose significantly, high inflation returned. The dramatic rise in inflation in 1991 was associated with negative real growth in that year. However, continued high inflation in the following year was accompanied by strong growth. Perhaps economic agents had already adjusted their expectations of inflation in 1992 and it did not have the shock effect of 1991. Financial savings were positive between 1987 and 1992, but they declined markedly in 1991 and 1992, as did the real interest rate which became negative in those years as a result of high inflation.

1.2.1.2 Financial Assets and Credit Policy, 1960-92

Table 1.3 presents the asset side of the consolidated balance sheet of the Monetary Sector in real terms, divided into net foreign assets and domestic credit to government and the private sector. In effect, the table depicts the extent to which liquid liabilities from the liability side of the balance sheet were used by the banking system to finance government and the private sector. The table also shows the extent to which the amount of liquidity is supported by international reserves of the monetary system.

TABLE 1.3

	1	2	3	4	5	6
	Liq.Liab.	net foreign assets	domestic credit, net	private credit	public credit	overall net position (1-2-3)
	J$million	J$m	J$m	J$m	J$m	J$m
1960	18.12	8.10	9.45	13.96	-5.58	0.57
1961	15.67	-0.05	16.08	14.52	0.17	-0.37
1962	20.53	2.86	17.64	13.63	2.81	0.03
1963	22.90	6.74	16.08	12.37	2.84	0.08
1964	24.84	4.18	20.52	16.52	3.34	0.14
1965	26.04	4.35	21.48	19.58	1.68	0.22
1966	29.35	7.59	21.66	20.45	1.04	0.09
1967	31.28	9.31	21.94	21.47	1.54	0.03
1968	37.73	12.19	25.46	24.06	1.89	0.07
1969	42.37	9.99	32.31	31.98	0.66	0.08
1970	44.66	10.74	32.30	31.89	2.86	1.63
1971	53.07	14.14	36.67	35.44	4.78	2.27
1972	59.47	8.93	45.13	43.02	8.35	5.41
1973	58.00	2.98	47.24	41.30	8.27	7.77
1974	59.37	5.44	41.51	38.15	4.48	12.42
1975	56.06	-0.62	48.87	37.85	14.16	7.81
1976	54.67	-11.43	59.03	33.46	25.86	7.08
1977	54.65	-11.74	61.57	26.34	33.08	4.83
1978	47.86	-22.13	65.80	23.45	33.22	4.18
1979	42.16	-23.61	62.60	21.51	43.33	3.17
1980	39.66	-20.88	57.73	19.67	31.78	2.81
1981	45.03	-25.34	67.29	23.69	43.06	3.08
1982	54.04	-29.31	79.02	30.33	45.67	4.34
1983	62.59	-71.54	128.18	34.29	54.96	5.95
1984	58.97	-65.28	118.03	31.35	46.86	6.21
1985	59.97	-64.36	116.74	26.13	31.78	7.59
1986	65.84	-57.31	115.40	27.33	36.66	7.74
1987	72.17	-46.65	107.97	32.95	19.64	10.85
1988	89.61	-58.54	133.47	42.80	7.13	14.68
1989	85.88	-35.80	105.63	48.90	-2.14	16.05
1990	83.97	-30.62	100.17	47.24	-10.43	14.42
1991	79.78	-37.13	106.83	43.26	-18.91	10.08
1992	80.67	-4.55	73.71	29.30	-7.66	11.51

Source: International Monetary Fund (1960 - 1995)

Where all the variables are measured in real terms.

Table 1.3 shows that real liquidity[9] grew over three hundred and forty five per cent between 1960 and 1992. The pattern of that growth over the period reflects the impact of the financial policies undertaken in, and the financial and economic climate of, each of the sub-periods. In general, Liquidity increased substantially during the laissez-faire years of high growth, 1960-1972, declined during the crisis years 1973-80 as well as during the stagflationary period 1984-86, and recovered thereafter.

Domestic credit was also a function of the credit policies of the government over the 1960-92 period, as well as of general financial and economic conditions. Between 1960 and 1972, real credit to the private sector was relatively high compared to credit to the government. The latter did not place any undue burden on the banking system, and credit was readily available to finance private sector activity. The net foreign assets of the financial sector were positive throughout the sub-period 1960-72 (except in 1961), the only time that this was so over the entire three decades of our study, except for 1973 and 1974, which can be seen as a carry-over from the 1960-72 period. Finance was generally available, there was no crowding-out of private sector borrowing by the government, and the banking system more or less accommodated the demands made upon it.

The 1973-80 period saw a dramatic rise in real government borrowing from J$8.3 million in 1973 to J$31.8 million in 1980, at the expense of private-sector borrowing which declined from J$41.3 million to J$19.7 million. Credit to the private sector was squeezed in order to finance government expansion. In addition, in an effort to tackle inflation and stabilise the balance of payments, extensive credit controls were put in place. Overall domestic credit grew more or less steadily over the period, but its mix between public and private sectors shifted decisively towards the former.

Government borrowing declined markedly between 1981 and 1992 under various administrations committed to reducing the size of the public sector and bringing the fiscal deficit under control. Indeed, there were net government deposits to the financial system for the last four years of the period. Private sector borrowing recovered as a result, though not dramatically, perhaps because of uncertainty and tight monetary conditions during the 1984-86 period and again in 1991-92 under the latest IMF programme. Consequently, as Table 1.3 shows, overall net domestic credit grew moderately between 1981 and 1992.

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[9] i.e. liquid liabilities as defined earlier.

It is worthy of note that net foreign assets were negative from 1975 to 1992, reflecting the chronic balance of payments problem faced by Jamaica. It is indicative of both capital flight and a substantial reduction in capital inflows, even taking account of official inflows during the years when Jamaica had IMF adjustment programmes.

1.3 The Years of High Growth: 1960-1972

The main objectives of economic policy during the period 1960-1972, were to generate development[10] and to support the initiatives taken by private capital. Sustaining the strong growth in output achieved in the 1950s was seen as the way to generate development. The government saw its role as a supportive one for the private sector, and to that end sought to build up the country's physical infrastructure and create favourable conditions for foreign investment. Fiscal incentives (tax holidays, etc) were used to induce new private capital, particularly foreign capital.

The economy grew in real terms by an average of 5.2 per cent over the period, stimulated principally by the bauxite sector and to a lesser extent tourism and manufacturing. Mining/processing of bauxite/alumina grew from around 8 per cent of GDP at the end of the 1950s to 11 per cent by 1972, with manufacturing growing from 13 per cent to 17 per cent over the same period[11]. The manufacturing sector as well as tourism, distribution, and services benefitted from the foreign inflows of capital that fuelled the growth of the bauxite industry.

Strong economic growth manifested itself in a growing deficit on the current account of the balance of payments, but this was consistently financed by capital inflows. The authorities were satisfied with the performance on the external account and the growth of the economy as a whole. Yet the high degree of openness of the economy (imports averaged 42.5 per cent of GDP and exports 37.7 per cent of GDP), and the uneven structure of production and exports (in favour of bauxite and tourism), meant that the potential existed for payments difficulties if export earnings or capital inflows were adversely affected.

In addition, the aforementioned decline of agriculture which was labour-intensive, led to a substantial rise in unemployment from 13.5 per cent in 1960 (89,000 persons) to 23 per cent

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[10] Boyd.

[11] Investment as a per cent of GDP grew from 21.9 per cent in 1960 to 35 per cent in 1969.

in 1972 (183,000). Bauxite production and processing, manufacturing and many services were more capital intensive than agriculture, so that although the economy grew rapidly it did not absorb significant numbers of the unemployed. Indeed the unemployment figures would have been higher were it not for the safety net of migration to the UK , the USA and Canada. Thousands of people migrated during the 1960's in search of jobs and a better standard of living.

Although there was a tendency to equate growth with development, the reality was that the degree of inequality increased between 1960 and 1972. Available income distribution data for the period 1958-1972[12] indicate that the income of the bottom 40 per cent of earners fell from 8.2 per cent of national income in 1958, to around 7 per cent in 1972. At the same time, the income of the top 5 per cent increased from around 30 per cent to about 37 per cent over the same period. Boyd (op cit, p.11) also points out that it deserves to be borne in mind that the level of income earned by the vast majority of households was extremely low in absolute terms. It was not until the mid 1970's that the problems of inequality and poverty were addressed directly by the government, but with disastrous consequences.

1.3.1 Money, Credit and Financial Policy, 1960-72

Monetary and financial policy during the years of high growth were aimed at protecting the balance of payments. Changes in Bank Rate reflected changes in interest rates in the United Kingdom and to some extent the USA, the main sources of capital. The objectives were to preserve the inflows of capital and to discourage any outflows that might be enticed away by higher interest rates abroad.

The Jamaica dollar was devalued by 1.4 per cent in 1967 and 15.3 per cent the following year, in response to the devaluation of sterling in November 1967. The rationale of the Jamaican authorities was to protect exports of bananas, sugar and citrus to the UK. Monetary policy after the devaluation was increasingly directed at keeping aggregate demand in check, particularly as inflationary pressures became more pronounced[13]. Bank Rate was kept at a higher average level of 5.7 per cent between 1967 and 1972, compared to 5.0 per cent between 1961 and 1966. At the same time selective credit controls were imposed to help contain aggregate demand, and specifically to curb imports. Included in the credit controls

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[12] Boyd, p.11.

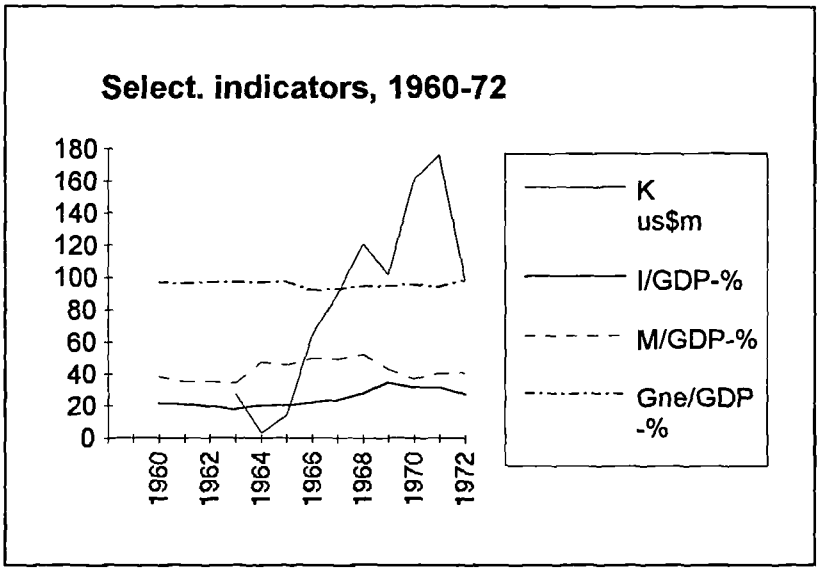
[13] See Brown, Adlith pp.12-13, and Table 1.1

were quantitative restrictions on the absolute amount of credit given by banks and finance houses and on credit to non resident companies and individuals. In addition, taxes on the purchase of foreign exchange were raised, and exchange control was introduced.

While it seems that various measures continued to encourage foreign capital inflows, their effectiveness in dampening domestic demand and in reducing the current deficit on the external account was limited. Higher interest rates did not dampen demand because the economy was to a large extent driven by foreign firms and foreign capital. Indeed foreign capital inflows contributed to the ready availability of liquidity. The Reserve Requirement imposed by the Central Bank was not onerous, increasing from 15 per cent in 1963 to 18.5 per cent in 1972. More to the point, it was not seen to be onerous by the banking and business sectors in the high-liquidity environment. In addition, credit controls did not appear to be unduly stringent, while the demand for imports for both consumption and investment seemed to be inelastic with respect to price: imported inflation did not contain the demand for imports provided that foreign exchange continued to be freely available to pay for them. Foreign exchange was readily available throughout the period.

Figure 1.5. shows the upward trend over the period, of real capital inflows (K), the investment/GDP ratio, the import/GDP ratio and gross national expenditure/GDP. Buoyant real economic growth and moderate levels of inflation except for 1970 when price controls on various domestic items were removed and inflation was high in Jamaica's main trading partners, were also features of the period.

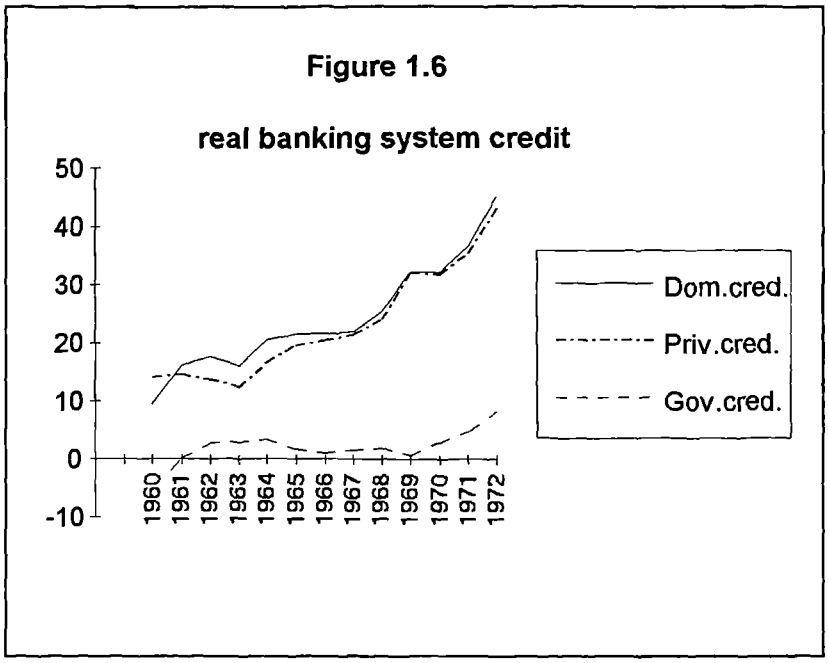
FIGURE 1.5



Source: International Monetary Fund (1960-1995)

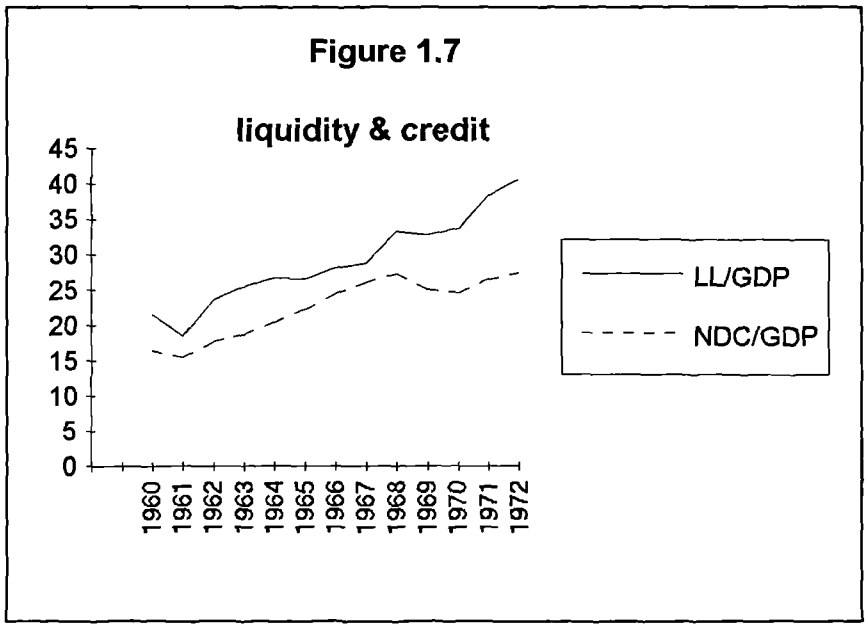
With moderate inflation and steady nominal interest rates, real deposit interest rates were positive for most of the period, or hovered around zero (except for 1961 and 1970 as explained above, when they were sharply negative). The growth rate of real financial savings was generally positive, increasing one hundred and fifty per cent in real terms between 1962 and 1972. The growth rates of real money narrowly defined, private sector financial savings and real liquid liabilities, were generally positive over the period.

Figure 1.6



Source: International Monetary Fund (1960-1995)

Figure 1.7



Source: International Monetary Fund (1960-1995)

The substantial increase in liquidity over the period supported an increase in real (net) domestic credit from j$9 million in 1960 to j$45 million in 1972. As discussed earlier, most of the increase took .place after 1967. The overwhelming share of credit went to the private sector, although the government's use of bank credit, though still low, had begun to creep upwards by the start of the 1970s. These relationships are demonstrated on Figures 1.6 and 1.7, with the latter showing the trends of net domestic credit (NDC/GDP) and liquidity (LL/GDP), both as a ratio of GDP. The period 1960-1972 was a period of financial deepening, with both the liquidity/GDP and credit/GDP ratios increasing.

1.4 The Period of Prolonged Crisis: 1973-1980

The stability and high growth of the 1960's and early 1970's were dramatically reversed during the 1973-80 period under a new leftist government elected in 1972[14]. The State sought to intervene in and control the economy quite overtly and on an unprecedented scale. The laissez-faire economic strategy of the 1960-72 period was replaced by an inward-looking one that emphasised national ownership and control, import substitution and self-determination. The means for achieving it were perceived to be vigorous government intervention aimed at controlling the commanding heights of the economy.

The main objectives of the new left-of-centre government that was elected in 1972 were the lowering of unemployment which, despite the high growth of recent years had reached 22.8 per cent in 1972, and the reduction of the income inequality that had become endemic. Fiscal policy was the main tool used initially, in an attempt to achieve those objectives. However, as economic performance declined, other macro-economic policy instruments were brought into play, as the government tightened its control of the economy.

The government embarked on an ambitious spending programme that involved numerous social projects designed to reduce poverty, increase employment and improve income distribution. The measures included free education, skills training, literacy programmes and nationalisation of various enterprises. As Figure 1.8 shows, the government deficit increased dramatically, the new programmes being paid for by domestic and external borrowing. After averaging 2.7 per cent per year between 1960 and 1972, the government deficit as a per cent of GDP grew from 4.1 per cent in 1972 to 20.7 per cent in 1980. Public debt grew from 26.8 per cent of GDP in 1972 to 84 per cent in 1980, of which just under 40 per cent was external.

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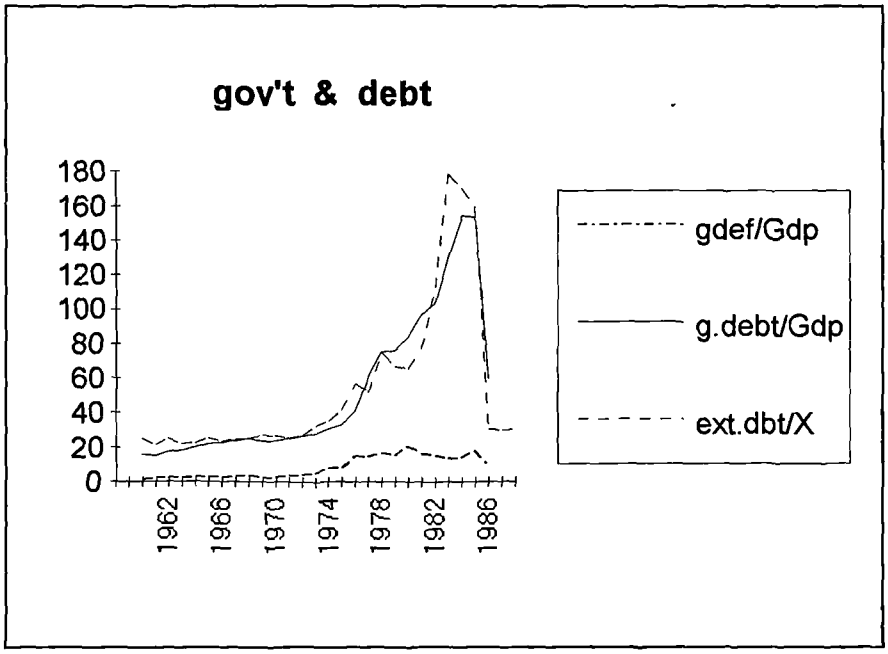
[14] The People's National Party led by Michael Manley.

FIGURE 1.8



Source: (1) IMF (IFS)
(2) World Bank (World Debt Tables - various).

At the same time, the government adopted a policy of maintaining the value of the real wage. The oil shocks of 1973 and to a lesser extent 1979, and multiple devaluations of the Jamaica dollar combined with escalating costs in the labour market, led to an unprecedented average inflation rate of 21.8 per cent between 1973 and 1980. Spiralling costs and various developments in the bauxite sector had an adverse effect on domestic production.

The bauxite sector declined between 1973 and 1980 as a result of several factors: the emergence of Australia and Guinea as competitive producers of bauxite/alumina; the global recession triggered by the two oil shocks; the increasing international use of plastics; the oil-dependent technology used by Jamaica to produce alumina which resulted in a doubling of costs, and the imposition by government of a levy on the production of bauxite which increased the tax revenue from bauxite from J$ 27 million in 1973 to J$ 180 million in 1974 alone. Jamaican Bauxite (alumina) as a per cent of world production, declined from 18.8 per cent (8.7 per cent) to 13.0 per cent (6.9 per cent) between 1972 and 1980, with bauxite output actually falling in absolute terms.

In addition, the government's policy and rhetoric on nationalisation did not encourage foreign investment. Also, uncertainty in international currency markets associated with the end of the Bretton Woods system of fixed exchange rates and the fact that the US dollar, to which the Jamaica dollar was pegged, was devalued in 1973, undoubtedly affected investor confidence. All these factors affected foreign investment adversely. Having averaged J$ 85.6 million per annum between 1963 and 1972, net foreign investment fell from J$ 75 million in 1973, to J$ 23 million in 1974, and to minus J$ 27 million in each of the years, 1978 and 1979. There were net investment outflows between 1975 and 1979, and capital flight is thought to have seriously eroded the balance of payments account.[15]

The decline in the bauxite industry and foreign investment and the cost pressures on the domestic sector, led to negative real growth every year between 1974 and 1980, except for 1978 when it was just above zero. Wide-ranging import controls were imposed on both final and intermediate goods, creating bottlenecks and further reducing efficiency in the production sectors. However, they were not consistently applied over the period and in any case export earnings and net capital inflows which together had kept balance of payments problems at bay, were no longer sufficient. External debt grew from 9 per cent of GDP in 1972, to 33 per cent in 1980.

In 1976 Jamaica's net international reserves became negative,[16] and the authorities were forced to direct their attention to the unsustainable external account. They had always been against borrowing from the upper-tranche facilities of the IMF, and instead tried to implement a self-imposed structural adjustment programme that included the following measures:[17] tight import and exchange controls; foreign exchange rationing; a dual exchange rate system; wage restraint and a suspension of external debt repayments. However, foreign capital failed to flow into the economy and Jamaica eventually concluded a two year Standby Agreement with the IMF in July 1977.

The Fund Agreement brought austerity without liberalisation.[18] A wholly inadequate sum of US$79.6 million was to be made available over two years, in return for which the

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[15] Boyd

[16] Boyd, p.26.

[17] Boyd, op. cit.

[18] Findlay and Wellisz, p.88

government deficit, domestic credit expansion and external borrowing were to be drastically reduced. However, the dual exchange rate, quantitative import restrictions, price controls, subsidies and the social programmes were to remain. It was a case of doing too little, too late, and of the IMF making available too few resources. The fiscal and monetary targets were not met, real growth was still negative, and the Agreement was abandoned in December 1977.

A more comprehensive Extended Fund Facility was negotiated in 1978 (and re-negotiated in 1979), under which US$250 million was made available. However, this time the conditions were more stringent and included: a single exchange rate; an immediate 15 per cent devaluation and a further 15 per cent devaluation over the succeeding 12 months; the removal of price controls and gradual reduction of subsidies; tax reform, the further reduction of the fiscal deficit and the curtailment of government borrowing and money creation by the Central Bank; limits of 15 per cent for the first two years on wage increases; a ceiling on commercial bank credit of 5 per cent above the level existing on the eve of the Agreement and an increase in the liquidity ratios of commercial banks to 40 per cent.

Once again, not all of the IMF targets were met and the Agreement was suspended in 1980. In general, the 1978 and 1979 IMF programmes resulted in a slight improvement between 1978 and 1980 in liquidity and the balance of payments, in part because of the inflow of official capital. However, the government deficit reached record levels in 1980, and real growth declined even faster (from 0.6 per cent in 1978 to minus 5.7 per cent in 1980).

The persistent negative growth rates and the erosion in economic welfare between 1973 and 1980, helped to undermine democracy and led to the 1980 "IMF" elections being fought in a virtual 'civil war' climate. Hundreds of people were killed in gun battles between supporters of the two main parties. Ironically, neither the social programmes of the government over the 1973-80 period, nor the IMF adjustment programmes had succeeded in improving the lot of Jamaica's poor. It can be argued that the IMF programme required more time and greater political will for it to be successful, but there is little doubt that it exacerbated the hardship being experienced, especially by the poor.

As for the huge fiscal expansion over the period, it failed to achieve its stated objectives of reducing unemployment and inequality. Unemployment in 1980 was 26.8 per cent, having peaked at 31.1 per cent in 1979, compared to 22.8 per cent in 1972.[19] Although accurate

[19] Findlay, op. cit. p.190

information on income distribution between 1973 and 1980 is hard to come by, Boyd (op. cit. Chapter 7) presents some evidence which suggests that inequality declined in the mid 1970s but that the trend was reversed during the latter half of the 1970's. The evidence indicates that the government's economic objectives were not achieved during the period of decline and that the social cost of the policies employed was high.

1.4.1 Money, Credit and Financial Policy, 1973-1980

Financial policy during the years of decline is inextricably bound up with the expansion of the government sector between 1973 and 1978 and with the various adjustment programmes implemented between 1978 and 1980. Indeed, as far as the latter sub-period is concerned, it is not at all an easy task to separate the effects of monetary and financial measures from other adjustment measures. Nevertheless, this section attempts to examine some important financial policy variables, changes in other variables, and possible links between them during the years of decline.[20]

The objectives of financial policy during the 1973-1980 period were essentially twofold: to stabilise the balance of payments, and to finance the government's economic and social programmes, the aims of which were to increase employment and reduce income inequality and poverty. Implicit in the latter objective was the financing of economic programmes ostensibly designed to increase domestic output, correspondingly reduce the dependence on imports and thereby stimulate economic growth.

As far as the financial sector is concerned, the policy responses of the authorities to the chronic balance of payments problems that arose during the 1970's and which have already been described, were directed at the capital and current accounts. Regarding the capital account, Bank Rate was raised from an average of 5.4 per cent between 1961 and 1972, to 8.9 per cent between 1973 and 1980, with a view to encouraging capital inflows and discouraging outflows. As private capital inflows were determined by the factors discussed earlier and not particularly by interest rates, capital inflows continued to decline, becoming negative for the five year period up to 1979.

The growing current account deficit in the first half of the 1970's was exacerbated by the high inflation caused by the 1973 oil shock and the multiple currency devaluations (see

[20] The actual behavioural relationships are analysed in subsequent chapters of the dissertation.

Table 1.1). The government sought to support its import licensing regime with controls on credit for a wide range of consumer and producer goods. That policy was successful in achieving its objective in so far as it was effectively implemented. The Imports/GDP ratio actually declined between 1974 and 1978, being in 1977 for example, just 76 per cent of its 1974 level.

The Reserve Requirement, that is, the ratio of liquid liabilities to demand liabilities of the Central Bank, was raised from 18.5 per cent in 1972, to 29.5 per cent in 1977,[21] at which level it remained for the rest of the period (see the Appendix to this chapter). This was an additional instrument used not only to dampen demand pressures, but to finance public sector expansion.

Despite high nominal interest rates, high inflation meant that real deposit interest rates were negative for the most part and the real liquidity of the banking system declined substantially (see Table 1.3)

The heavy-handed credit and import controls on intermediate goods created severe shortages of capital equipment for production, which had a serious effect on economic growth. In addition, the rapid expansion in government borrowing from the banking system was effected at the cost of private-sector borrowing. The government used the financial system to generate cheap credit (i.e. at negative real interest rates), which was often squandered on non-productive programmes. Stone and Wellisz (1993) have this to say:

> "Most of the government's new schemes proved to be expensive, ill-conceived, and mismanaged" (p.182).

As Table 1.3 shows, real credit to the government grew dramatically at the expense of credit to the private sector between 1973 and 1980. Real credit to the private sector declined by 52 per cent, while governemnt borrowing grew nearly three-fold. Investment as a per cent of GDP declined by 50 per cent (see Table 1.1), while the real economic growth rate was negative for virtually the entire 1974-80 period.

In general, the policies of high nominal interest rates and credit controls were reinforced under the IMF programmes adopted between 1977 and 1979. It is remarkable considering the

[21] Dawson, Christine E (1992).

usual approach of the IMF, that under the 1977 Agreement the fiscal expansion, wage indexation, and the regime of price controls and subsidies were allowed to remain largely intact. It is only after the abrogation of the 1977 Agreement that the IMF insisted on reversing those three sets of policies in the 1978 and 1979 Agreements. Yet Jamaica's economic performance continued to be poor and if anything worsened. It may be that more time was needed for positive results to begin to show, or that a more stable political climate was required to restore private-sector, worker and international confidence in the economy.

In addition, though little information is available on the size and influence of the informal currency and credit markets, their emergence and growth in response to financial and economic controls must have had some impact on economic performance. In particular, it is likely that they helped frustrate government policy by facilitating capital flight, the substitution of foreign currency (particularly US dollars) for domestic currency, hoarding of foreign exchange and exacerbation of foreign currency shortages. The performance tests relating to the 1979 Agreement were failed at the end of that year, the Agreement was suspended, and Jamaica descended into chaos and anarchy during the months leading up to the general election in October, 1980.

1.5 The Period Of Intermittent Recovery: 1981-1992

The period 1981-1992 was characterised by initial recovery lasting from 1981-1983, severe adjustment and stagflation between 1984 and 1986, and a second recovery from 1987 to 1992.[22] A pro-business and pro-IMF government was elected in 1980, and relations with the IMF improved. The decade is also characterised by the implementation of various IMF-supported adjustment programmes, but the policies followed by the authorities were not always in keeping with macro-economic objectives.

The main economic objectives over the 1981-1990 period were the restoration of balance of payments stability and the generation of economic growth after the long years of decline. During the 1970's the government expected growth to occur almost as a by-product of its employment and re-distribution programmes. After the spectacular deterioration of real output and general economic well-being, it was obvious that there had to be a re-orientation of priorities. Real growth had to be made a specific objective of economic policy.

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[22] Boyd, op.cit.

1.5.1 The Short-Lived Recovery of 1981-1983: Financial and Economic Developments

In the immediate aftermath of the elections in October 1980, the atmosphere of business insecurity was replaced by one of optimism. Private capital inflows were positive for the last quarter of 1980, and the shortage of food and consumer items was, to some extent, abated by the relaxation of some import controls. Yet because of the foreign exchange and balance of payments problems, a comprehensive liberalisation of imports could not be contemplated. The government's policy response to the balance of payments problem was to borrow from the IMF in 1981 (SDR 537 million over 3 years, of which SDR 237 million was made available in the first year), in order to finance the current account deficit. At the same time the partial relaxation of import controls, especially on capital goods, and the selling off of selected state enterprises to the private sector, were intended to boost domestic production and exports. It was also the government's aim to reduce the fiscal deficit by at least ten per cent in order to release financial resources for private sector growth.

In practice the current account deficit of the balance of payments actually worsened, in part because of the relaxation of import controls, and in part because export performance did not improve. Stimulating exports was not simply a matter of demand management but required the targeting of specific products and markets, incentives to encourage manufacturing, and restructuring of the real economy. Exports were still dominated by the bauxite sector which was still depressed.

Although the current account deficit widened, it was financed by capital inflows. However, the composition of those inflows had changed from the heady days of the 1960s. Nearly all were official flows generated by direct government borrowing or government guaranteed loans. In addition to the IMF loan, three Structural Adjustment Loans totalling us$191 million were obtained from the World Bank during the early 1980s. The IMF and World Bank applied cross conditionality to their lending programmes, so that IMF loans were not forthcoming without structural adjustment, while the World Bank loans were given subject to the IMFs stamp of approval on Jamaica's financial management.

The structural adjustment programme included the reduction of import and price controls, the removal of food subsidies and subsidised interest rates for farmers, government divestment of land and public enterprises, and more effective marketing of export crops. The Structural Adjustment Loans went to the government and not directly to farmers or the

agricultural sector. In practice the removal of subsidised interest rates discouraged agricultural production, while the export marketing effort became bogged down in bureaucracy and was not effective. There was no real structural adjustment, but the build-up of foreign debt was substantial. Although private inflows had improved immediately after the election, this situation did not last, as a 'wait and see' attitude descended upon the private sector which had been responsible for the earlier capital flight. In any case the huge bauxite related inflows were a thing of the past. Thus the IMF and World Bank loans while being a temporary salve, led to even greater long-term debt problems than those with which the country was already saddled. The percentage of debt to GDP grew from 84.6 per cent in 1980, to 130 per cent in 1983, while the external debt/exports ratio doubled from 33% to 66% over the same period. Chapter 5 of this thesis examines the effect of external debt on domestic savings, investment and economic growth in Jamaica.

The monetary and financial policies implemented in pursuance of the government's economic objectives included the relaxation of credit controls on some items of a capital nature in an attempt to stimulate both output (with some success) and exports (with, as has already been mentioned, limited success).

The IMF had not initially insisted on devaluation as is their wont, and wage increases were contained. Consequently, inflation averaged a relatively moderate 10.3 per cent between 1981 and 1983, compared with 30.4 per cent on average over the previous three years (see Table 1.1).

Bank rate was kept at its 1980 level and with moderate inflation, the real deposit rate became positive in 1982 and 1983. Liquidity increased and real credit to the private sector improved (see Table 1.3). The government's fiscal performance over the period improved substantially. However, the reserve ratio on the banking system, was increased from 29.5 per cent to 36.0 per cent in 1982 and 44.0 per cent in 1983. These increases probably helped to limit the impact on demand, of the relaxation of credit.

In general, this was a period of a certain degree of economic liberalisation and some fiscal discipline. The real growth rate was positive for the first time since 1973 (except for 1978 when it was less than 1 per cent), and was an average 2.1 per cent from 1981 to 1983. However, the recovery was evidently fragile and the prospects were not good. The current account of the balance of payments had worsened substantially, debt had risen, and real

growth though positive, was sluggish. Restructuring of the real sector had not taken place and inflation had actually begun to rise again in 1983. Net capital inflows were again negative in 1983, and the breaching of the IMF targets on international reserves and domestic financial assets led to the suspension of the IMF Programme.

1.5.2 Severe Adjustment and Stagflation, 1984-1986

The government called a snap election in December 1983 in order to seek a fresh mandate to take whatever action was necessary on the economic front. The election was not contested by the opposition and the new government immediately negotiated a rigid one year adjustment programme with the IMF supported by a Structural Adjustment Loan from the World Bank, which was followed by an equally austere two year programme in 1985. They were much less flexible than previous ones. The main economic objectives were balance of payments stabilisation, the containment of inflation which had begun to rise again and the generation of a higher level of savings in order to "lay the foundation for sustained economic growth".[23] The received wisdom from the IMF was that prior savings had to be generated to allow economic growth to take place.

In order to remove distortions affecting domestic economic activity and to stimulate real growth, the authorities removed all price controls and dismantled the system of import licensing under the terms of the World Bank loan. It was hoped that the latter measure would remove the constraint on the importation of capital goods for industry.

Financial measures included a 63 per cent rise in deposit interest rates between 1983 and 1985, in an effort to attract foreign capital and dampen domestic demand. There was a massive devaluation of the currency, of 184 per cent between the end of 1983 and 1986 in an attempt to improve the competitiveness of exports, discourage imports (apparently, no calculation was made of import elasticities to determine the likely impact on imports), and reduce the current account deficit. Further attempts were made to reduce the fiscal deficit and there were cuts in public sector employment, services and subsidies, and increases in taxes, duties, and levies.

Ceilings were imposed on commercial bank credit to the private sector and the government, and the reserve requirement was increased from 44 per cent in 1983 to 48 per cent

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[23] Boyd, op. cit., p.61.

in 1984. Even when the reserve requirement was lowered in subsequent years, it remained high at 38 per cent in 1985 and 35 per cent in 1986.[24] It was the standard IMF medicine of tight fiscal and monetary policy to contain inflation and generate savings, the liberalisation of price and quantity controls to restore free-market forces and stimulate growth, and devaluation to restore international competitiveness and stabilise the balance of payments.

The outcome however, was quite different. The removal of price controls and the massive devaluation resulted in high inflation, which was an average 23 per cent between 1984 and 1986, more than double the average over the previous three years. Export performance improved under targeted export promotion schemes financed by the World Bank, but was more than offset by the substantial increases in imports, and the current account deteriorated. High nominal interest rates did not stem the net outflow of private capital, and overall capital inflows were positive in 1984 and 1985 only because of heavy government borrowing from the IMF. In 1986, however, the heavy external debt burden came home to roost and overall net capital inflows were negative as repayments on official debt exceeded receipts.

The tight monetary and fiscal policies succeeded in reducing real credit somewhat, but the measures may have been too harsh and implemented over too short a time period. Business confidence was certainly adversely affected by the numerous multiple devaluations, while the atmosphere of austerity gave rise to widespread social unrest and great uncertainty about future economic prospects. The real growth rate of the economy again became negative in 1984 (-0.8 per cent), 1985 (-4.7 per cent), and 1986 (-2.1 per cent). The widespread feeling was that adjustment had been too rapid. Despite (perhaps because of) the strong measures, the criteria under the IMF programme were not met, leading to the termination of the Agreement in 1985. Yet there were signs in 1986 - improvement in the growth rate and the reduction in inflation from 25.7 per cent in 1985 to 15.1 per cent in 1986 - that recovery may have been imminent.

1.5.3 The Second Recovery: 1987-1992

During the years 1987-1992, the pace of adjustment was deliberately reduced, as the government opted for a strategy of "adjustment with a human face". The old concerns about the balance of payments and economic growth had not receded but, influenced by protests from

[24] Dawson, Christine (1992).

all strata of society as well as by the adverse impact of the severe austerity measures of 1984-1986, the new approach emphasised the need for a more moderate process.

The new Agreement reached with the IMF in January 1987, paid special attention to the need to reduce inflation and to restore not only business confidence, but worker confidence in the economy. Price controls on basic foods, medicines and agricultural imports were re-imposed to help check inflation, but retrenchment in the public service was reduced and wages raised. On the financial side the exchange rate was kept virtually stable until 1990, while Bank Rate was actually lowered in 1987 and 1988 in an attempt to keep costs facing firms from rising.

As a consequence of the above measures, inflation dropped in one year, 1987, by more than half to 6.7 per cent, and was just 8.3 per cent a year later. It rose again in 1989 to 14.3 per cent, probably because of a lagged effect due to the relaxation of the government's tight control on wages, as well as increasing business costs associated with rising interest rates and further currency devaluation. Interest rates were raised to increase liquidity and attract capital inflows. The Reserve Ratio on commercial banks was lowered, borrowing by the government drastically reduced, and credit by the banking system to the private sector significantly increased (see Table 1.3).

The financial policies were used to support other measures taken to stimulate real activity and improve the balance of payments. Numerous agricultural sector reforms, including the re-vitalisation of the banana industry, the provision of incentives and the subsidising of non-traditional agriculture, all helped to boost agricultural production and exports. The privatisation of much of the state owned tourism plant, the recovery of world demand and the increase in credit to the tourism sector, all increased export earnings from tourism. In addition, reductions in the bauxite levy, the negotiation of new agreements with US companies and recovery in international demand led to some recovery in the bauxite sector.

The improvements in export agriculture, tourism and the bauxite industry, contributed to the strong growth rates experienced during the period. Jamaica was devastated by hurricane Gilbert towards the end of 1988. Despite this, growth performance was strong in that year and in subsequent years (see Table 1.1), and was partly financed by private and public capital inflows earmarked for the re-construction of the physical infrastructure. However, one unhealthy aspect of the state of the government and external accounts was the high public

sector debt repayments caused by the heavy borrowing of previous years. Arrears of debt service amounted to J$200 million in 1990 and the government concluded a Standby Agreement for SDR 82 million in that year supported by an Agricultural Sector Adjustment Loan of us$25 million from the World Bank. The large currency devaluation of 25 per cent under the IMF agreement, and subsequent devaluations sent inflation soaring to 51 per cent in 1991. This, combined with the onerous public expenditure controls imposed by the IMF, provided a substantial shock to the economic system in 1991 and Jamaica experienced negative economic growth of -1.3 per cent. Strong positive growth resumed in 1992 as the onerous fiscal stance was eased, but inflation reached a staggering 77 per cent as the currency was devalued by a further 89 per cent.

A new government was elected in 1989, but it seemed unwilling to return to the days of high fiscal deficits and appeared more ready to embrace prudent economic management. Indeed both political parties appeared to have learned from their mistakes: the government of 1981-1989 realised somewhat belatedly, that people and their well-being must be the objects, not the incidental by-products of policy. For its part, the government in power during the 1973-80 period seemed to have been chastened by the unmitigated disaster of that period, and undertaken to target external stability and growth as objectives of policy, and to nurture private enterprise while relaxing government controls. Dealing effectively with poverty and inequality is a long-term process and sacrificing sound management in the short and medium term exacerbated the very inequality that the government had tried to reduce. Nevertheless, given the heavy debt burden and multiple currency devaluations under various IMF programmes between 1977 and 1990, it is difficult to see how Jamaica can service its foreign debt (particularly the multi-lateral debt denominated in foreign currency), and still grow at a sustainable pace without substantial debt forgiveness by the international community. Jamaica's external debt stood at around J$3.8 billion in 1990, while public sector debt service payments (mainly to the IMF and World Bank), exceeded the inflows of new loans. In addition, it is doubtful whether the high inflation rates of the 1990s are favourable to economic growth. The effect of inflation on growth is examined in Chapter 4.

1.6 Summary and Conclusions

This chapter has examined the structure and performance of the Jamaica economy between 1960 and 1992. Three distinct sub-periods were identified: the period of high growth and low inflation, 1960-1972; the period of high inflation and mainly negative growth, 1973-

1980 and the period of intermittent recovery in which growth performance and inflation were mixed, 1981-1992.

During the first sub-period, 1960-1972, government policy was aimed at encouraging private enterprise, attracting foreign capital and supporting the export sector. The government deficit was low over the period, growing from 1 per cent of GDP in 1960 to 4 per cent in 1972. Nominal interest rates were generally kept below 5 per cent and real interest rates were mainly positive. The balance of payments was generally in deficit on current account, but it was adequately financed by capital inflows.

However, the government failed to give attention to the lop-sided structure of production and exports, the high degree of openness of the economy and the significant inequalities in the distribution of income. The economy was dominated by bauxite and traditional agricultural production and little attempt was made to diversify output or exports. This was to prove costly in later years when both traditional agriculture and capital inflows declined.

The second sub-period, 1973-1980, was characterised by rapid expansion of the public sector, the use of high nominal interest rates in an effort to increase savings and curb inflation and the use of IMF loans towards the end of the period. The fiscal deficit grew from 5.3 per cent of GDP in 1973 to 21 per cent in 1980, as the government attempted to reduce income inequality by initiating a wide range of social programmes. As mentioned above, many contemporaneous commentators maintain that there was a great deal of government waste, inefficiency and corruption. As shown on Table 1.3, real government borrowing from the banking system grew nearly three-fold between 1973 and 1980, while private borrowing declined by around 52 per cent. Subsequent chapters of this study examine the question of whether or not government expansion crowds out private borrowing and private investment or has any impact on economic growth in Jamaica.

The policy of raising interest rates to contain inflation and generate economic growth did not seem to be effective in either of the two sub-periods, 1973-80 and 1981-92. The economy experiencced severe inflation throughout the sub-period 1973-80 and for much of the sub-period 1981-92.

The approach of the authorities in Jamaica to financial policy, particularly from 1973 onwards, followed conventional wisdom in its belief that raising the nominal interest rate increases saving and promotes growth. On the other hand, this policy was coupled by rapid and unbridled expansion of the public sector, certainly between 1973-1980. As argued above, it is doubtful whether this fiscal strategy or the financial policies achieved the stated objectives of high employment and growth, low inflation and a more equitable distribution of income. Heavy foreign borrowing and multiple currency devaluations under various IMF and World Bank programmes have inflicted a heavy debt burden on Jamaica, with the numerous devaluations contributing to the emergence of severe inflationary pressures at various times, but particularly during the early years of the 1990s. It is difficult to avoid the conclusion that IMF and World Bank policies in Jamaica have largely failed to bring about sustained growth, as have the policies of various administrations between 1972 and 1992. IMF and World Bank conditionality seems to have been too onerous in the late 1970s and during the 1980s, while the structural adjustment programmes of the Bank seem to have been inappropriate and less than successful. The experience of Jamaica is similar to that of many developing countries that have received balance of payments support from the IMF or structural adjustment loans from the World Bank (see Mosley et al, 1995)

Chapter 2 examines the financial liberalisation hypotheses on which many of the financial policies undertaken by developing countries were based, knowingly or unknowingly, and often under the influence of the IMF. Subsequent chapters analyse the behavioural relationships among financial variables and between financial and real sector variables. An assessment is then made of the efficacy of financial and economic policy and the extent to which the predictions of financial liberalisation models are appropriate for Jamaica.

APPENDIX 1.1

Statutory Reserve Requirement Imposed on Commercial Banks

(Liquid assets as a percentage of Demand Liabilities)

1961	5.0
1962	15.0
1963	15.0
1964	15.0
1965	15.0
1966	15.0
1967	15.0
1968	15.0
1969	17.5
1970	17.5
1971	17.5
1972	18.5
1973	21.0
1974	23.5
1975	24.5
1976	27.5
1977	29.5
1978	29.5
1979	29.5
1980	29.5
1981	29.5
1982	36.0
1983	44.0
1984	48.0
1985	38.0
1986	35.0
1987	20.0
1988	20.0
1989	32.5
1990	35.0

CHAPTER 2

THE FINANCIAL SYSTEM AND THE THEORY OF FINANCIAL LIBERALISATION

2.1 Introduction:

The importance of the institutional and structural arrangements of the financial system and the growth of the financial sector for economic development, have been emphasized in the economic literature since the 1950s. The role of finance in capital formation and development has, from the earliest days, been considered to be an important part of economic inquiry (e.g. Adam Smith 1776, Robertson 1926, Clark 1935, Keynes 1936, Schumpeter 1934 and 1939). However, the 1950's and 1960's brought renewed interest in the question of the linkages between the financial economy and economic growth.

There are two broad approaches to the analysis of the link between financial development and economic growth and development (Patrick, 1966). They are the prior-saving (supply-leading) and the investment-led (demand-following) approach. The former holds that prior savings are necessary for investment and growth, and that the development of the financial system increases loanable funds, facilitates credit expansion, generates more investment and brings about greater economic growth. The policy implications call for measures that increase savings with the presumption that such an increase leads automatically to more investment (see Thirlwall, 1989). In the investment-led approach, it is investment-generated growth in real output that causes the financial system to develop and respond to the demands placed upon it.

The two approaches to the analysis of financial development and growth have different policy implications. If it is believed that prior savings are required for investment and growth, then economic policy will be geared to improving the savings effort. On the other hand, if it is believed that it is investment that stimulates growth and savings, then the focus of policy will be on improving the amount and efficiency of investment.

Section 2.1.1 of this introduction provides an overview of some of the early contributions to the issue of the role of the financial sector in development. Virtually all the contributions implicitly or explicitly assume that prior savings are essential for investment.

Consequently, the financial system plays a key role in stimulating savings and making financial resources available for investment. It is perhaps natural if one holds this view, to go one step further as McKinnon and Shaw did independently in 1973 and argue that repressing the financial system is inimical to growth, and liberalising it promotes growth.

Section 2.2 of this chapter analyses the theories of financial liberalisation. Sub-section 2.2.1 clarifies the meaning of financial repression and financial liberalisation, while the original contributions of McKinnon (1973) and Shaw (1973) are analysed in Sub-section 2.2.2. Static, dynamic, and open-economy extensions of the McKinnon-Shaw framework developed by Kapur (1976, 1983), Mathieson (1979, 1980) and Galbis (1977), are examined in Sub-section 2.2.3 and the Neo-Structuralist position is considered in Sub-section 2.2.4. Neo-Structuralists (e.g. Taylor 1983, Van Wijnbergen 1983a and 1983b, and Buffie 1984), employ some Keynseian adjustment mechanisms in their models. For instance, adjustment in goods markets are brought about mainly by changes in income not prices. However, their analysis of the workings of financial markets, in particular the curb market which assumes great prominence in their models, is based on the premise that prior savings are needed for investment.

The Post-Keynesian position typified by the work of Burkett and Dutt (1991) and Dutt (1991) is dealt with in Section 2.3. Their view is that investment and effective demand determine output, income and savings through the multiplier or through the re-distribution of income among different classes with different saving propensities.

The chapter would be incomplete without considering some of the recent work on the limits to financial liberalisation in Section 2.4. Many of the arguments presented are of a different sort than those of the rest of the chapter, in that they address the 'micro' or institutional aspects of financial market failure and instability. In essence the argument is that financial liberalisation is rendered ineffective or is short-circuited by various forms of market failure, which impose limits on the extent to which liberalisation can be pursued. Indeed, the very notion of financial liberalisation is called into question. Sub-section 2.4.1 considers the limits to financial liberalisation and the extent to which controls on and rigidities in the financial system (for example credit rationing) can persist even in liberalised financial markets. Sub-section 2.4.2 looks at the limits that free competition and imperfect bank supervision can place on financial liberalisation by creating instability in financial markets. The overall summary and conclusions of the chapter are presented in Section 2.5.

2.1.1 The Financial System and Economic Development: A Brief Overview of Some Early Contributions

Abramovitz (1952) analyses the role of finance in capital formation and growth, although he considers the precise links between money and credit on the one hand, and growth on the other, to be unclear. For him, finance involves two kinds of activity: financial intermediation or the transfer of funds from savers to investors, and credit creation or the provision of credit to investors in excess of planned saving. In practice, economic growth is achieved by improving the effective productivity of capital (i.e. by increasing the net yield of additions to the capital stock), in which process financial intermediation and financial organisation have a key role to play.

Lewis (1955) stresses the importance of the organisation of the business environment in facilitating savings and investment, particularly limited liability and the easy marketability of assets which he refers to as the chief institutional requirements for an easy flow of savings from lenders to borrowers. He also places great emphasis on the need to tailor both saving and investment institutions to suit the respective economic agents at the local and community levels.

Lewis' (1955) vision of the intermediation process includes a strong role for government in creating adequate financial incentives for savings and investment. Interest rates are to be subsidised if necessary to make them more attractive to savers, while savers are to be sufficiently protected to encourage them to lend to investors. Governments are to create specialised institutions to channel funds into priority sectors, and they also have the prime responsibility of channelling forced savings (taxation) into public works, public utilities etc, which Lewis sees as being essential prerequisites of development.

In his study of thirteen "advanced" countries,[1] Goldsmith (1955) seeks to discover how differences in their financial structure are responsible for differences in their rate and character of economic growth. His conclusions regarding the direction of causation between financial development and growth are tentative and inconclusive. Nevertheless, he does conclude that growth and the development of the financial economy go hand-in-hand. In his later study of financial institutions in the American economy, he writes (Goldsmith 1968, p.155):

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[1] i.e. countries with high values of real per capita national product and fully developed financial systems.

> "The development of financial intermediaries over the past century is so closely intertwined with the growth of the entire American economy, ... with modifications of the structure of the economy, such as the declining share of agriculture and the hand trades, ... with the introduction of new forms of financial instruments, ... and last but not least with the technical and economic innovations in the field of financial intermediation. ..."

The contribution of Gurley and Shaw (1955, 1960) draws on the work of Goldsmith but develops the idea that development is associated with the creation and expansion of debt, and that the institutionalization of saving and investment (i.e. financial intermediation), quickens the growth rate of debt[2] relative to that of income and wealth. The very process of financial intermediation reconciles surplus and deficit spending in the economy, and acts as a stimulant to economic growth.

For Gurley and Shaw, it is a mistake to net out the non-bank financial sector and to assume that it is sufficient to concentrate on the monetary and banking systems. It is precisely the developing diversity of the financial system as a whole, that facilitates an ever-growing quantity and variety of financial assets and debt. This diversity generates greater choice, opens up a larger spectrum of channels for the flow of loanable funds (from ultimate surplus to ultimate deficit spending units), and provides the potential for greater economic growth.

As development takes place, there is a tendency for indirect financing to grow relative to both self-finance and direct finance. The deficits of economic units leave a residue: debt and a change in financial capacity, and Gurley and Shaw[3] insist that the theory of growth is incomplete without taking account of the financial sector. Specifically, changes in the terms of trading (including market prices) of loanable funds, debt accumulation and its relative distribution among economic units, and changes in financial capacity may affect growth.

In addition, Gurley and Shaw (1960) argue that in general countries go through three broad stages of financial development. The first stage is characterised by the predominance of outside money (i.e. money backed by non debt-creating assets), which, on account of the undeveloped nature of financial intermediation in the economy, retards growth. In the second

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[2] i.e. the borrowing of deficit spenders from surplus lenders in the economy, via the financial intermediaries.
[3] Op. Cit.

stage, inside money (i.e. money backed by debt-creating assets) and financial intermediation assume greater importance in the process of mobilising and providing loanable funds for investment. In the third stage, a wide variety of financial instruments is provided by both intermediaries and centralised financial markets, with the latter providing both a primary function of raising new money and the secondary one of facilitating the exchange of existing shares (the secondary function being predominant). The precise characteristics of the financial system depend on the particular stage of economic development of the country at some chosen point in time.

Tun Wai (1956) examines the size and structure of the organised money markets of a selection of developed and developing countries. He concludes that not only is the institutionalised money market larger relative to national income in developed countries, but that their level of interest rates is generally lower and the range of rates more narrow than for developing countries. Furthermore, in his later study of unorganised money markets of underdeveloped countries (Tun Wai, 1957), he finds that interest rates are generally very high relative to those in the organised money markets, as well as in relation to what is needed for capital accumulation and rapid economic development. All these characteristics reflect the smaller number and variety of financial institutions and the narrower range of financial instruments in developing countries which collectively give rise to relatively underdeveloped and inefficient financial systems. The link between the persistence of immature financial systems and low levels of economic development is, for Tun Wai, inescapable.

In his studies on the role of the money market in supplementing monetary policy (1967), and on the importance of household savings in development (1972), Tun Wai finds that although financial savings grow faster than overall savings in both developed and underdeveloped countries, the ratio of financial savings to national savings is smaller for the latter group. He argues that financial savings depend on the rate of interest, financial stability, and the growth of per capita income, and as a matter of policy the rate of interest should be kept high to increase domestic savings for development. This prescription and his previous findings that unsustainably high interest rates are a fact of life in underdeveloped countries (and somehow seemed to be tied up with economic backwardness), make strange bedfellows. His policy prescription seems to be a precursor of the liberalisation hypothesis of McKinnon-Shaw in the 1970s.

Cameron (1962, 1967, 1972), and Patrick (1967) attempt to discover the "operational linkage" between financial and industrial development. Financial innovation increases the degree of specialisation in the receipt and disposition of income, thereby improving the allocation of resources and generating higher productivity and economic growth. In addition to the role of intermediation and that of supplying the means of payment, financial institutions also supply initiative and enterprise for the creation, transformation, and expansion of industrial ventures. The role of the financial system is not passive or merely "demand following". The link between financial and economic development is two-way, with the financial sector being proactive rather than responsive to industrial development. The key is financial innovation which affects the demand for and supply of investable funds by: (a) improving the techniques of collection and distribution (of funds); (b) increasing security differentiation which appeals to the demand by surplus and deficit spenders for diversification of assets and liabilities, and (c) transforming the lending process via the spreading of risks, the passing on of economies of scale through cost reductions, accelerating the specialisation of intermediaries, and providing additional advisory and other services.

In Patrick's(1966) view, there is a strong connection between the financial system and the capital stock, and in turn a strong, direct, and monotonic link between the capital stock and real output. The financial system influences real growth via its influence on the capital stock. This is effected in three ways: (1) intermediation between various types of asset-holders changes the ownership and composition of tangible wealth, thereby making its allocation more efficient; (2) intermediation between savers and investors re-allocates new investment to more productive uses and (3) by inducing increases in the rate of capital accumulation, the financial system provides incentives to save, invest and work.

The contributions described so far as well as the majority examined later in this chapter (with some notable exceptions, in particular the Keynesian and Post Keynesian models), lie in the mainstream of the prior-savings approach - i.e. they assume that it is necessary to accumulate savings which are then more or less automatically transformed with the help of the financial system into investment and growth. This assumption leads the proponents of the prior savings approach to argue that savings must be encouraged by maintaining high yields on financial assets, and by removing any restrictions on their growth. Interest rates must be kept positive and high, the banking system must not be taxed by reserve requirements and the financial system must be free of other distortions like credit controls. As a result the savings effort will be greater, thereby leading to more investment and a higher rate of economic growth.

However, the early contributions reviewed so far were general in nature and did not provide an in-depth analysis of the links between perceived distortions in financial markets and economic growth. It was left to McKinnon (1973) and Shaw (1973) to systematically analyse the relationship between financial repression and growth, and to argue the case for financial liberalisation.

2.2 *Theories of Financial Liberalisation*

In their seminal work undertaken separately, McKinnon (1973) and Shaw (1973) go beyond the various approaches of their predecessors to examine the nature of financial repression in developing countries. The alternative strategy of financial liberalisation that each of the two authors argue in favour of, has formed the basis of financial and economic policy by many governments of developing countries and by regional and international organisations (e.g. the International Monetary Fund and the World Bank).

This section begins by clarifying the concepts of financial repression and financial liberalisation, and then proceeds to analyse the principal models of financial liberalisation to be found in the literature on financial development. The original models of McKinnon (1973) and Shaw (1973) are first analysed. An evaluation is then made of the main extensions (static, dynamic, and open-economy) of the McKinnon-Shaw model, followed by an examination of the Neo-Structuralist models with their emphasis on informal financial markets. Although the latter share some common assumptions and insights with Keynesian-type models, the justification for placing them together with the theories of financial liberalisation, is that ultimately they do not appear to be fundamentally opposed to the liberalisation hypothesis per se, but rather to the way in which it is often implemented and the sectors that are affected. In addition, the Neo-Structuralists are diametrically at odds with the Keynesian view that prior savings are not needed for investment.

2.2.1 *Financial Repression and Financial Liberalisation*

Before proceeding further, the terms 'financial repression' and 'financial liberalisation' need to be clarified. Financial repression generally refers to the existence of (often indiscriminate) "distortions of financial prices including interest rates and foreign exchange

rates and by other means" (Shaw).[4] In a financially repressed economy, the Monetary Authorities[5] distort the financial markets by imposing various regulations on them. These may include ceilings on deposit or loan interest rates (or both), compulsory credit allocations with or without subsidised interest rates and reserve requirements on commercial banks. The main argument is that financial repression discourages the growth of savings and investment, and in the words of Shaw (1973),[6] reduces "the real rate of growth and the real size of the financial system relative to nonfinancial magnitudes. In all cases this strategy has stopped or gravely retarded the development process."

McKinnon (1973)[7] argues that developing economies are generally fragmented, with access to bank credit and the formal banking sector being the "financial appendage of certain enclaves: exclusively licensed import activities, specialised large-scale mineral exports, highly protected manufacturing, large international corporations, and various government agencies." Consequently, financing of the rest of the economy must be met from the "meager resources of moneylenders, pawnbrokers, and co-operatives". It is this phenomenon, which McKinnon views as being bound up with the regulation of the financial sector and the poaching of its resources to finance the current account deficits of governments, that McKinnon calls financial repression. In such a situation, economic agents desirous of investing have to resort to a much greater degree of self-finance and the size of the financial sector is unduly constrained.

Financial liberalisation refers to the process of removing or significantly reducing the degree of repression of the financial sector. In practice this means unshackling interest rates and the allocation of credit from government controls, and reducing inflation in order to raise real interest rates. The argument is that higher real interest rates increase savings which, when coupled with a competitive financial system, raises both the quantity and quality of investment, thereby generating economic growth.

2.2.2 McKinnon and Shaw

The work of McKinnon (1973) and Shaw (1973) provides a theoretical framework for analysing the role of financial development in economic growth. Specifically, they argue that financial repression retards economic growth and they stress the need to liberalise the financial

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[4] Op. Cit., p.3
[5] Usually comprising the Central Bank and the Government.
[6] Op. Cit., pp.3-4.
[7] p.68.

system as an essential part of any growth-enhancing strategy. They challenge important assumptions in the monetary models of Keynes, Keynesians, Neo-Classical and Neo-Structuralists, in the context of developing countries. They argue that financial repression in such countries often manifests itself in nominal interest rate ceilings, high inflation, credit controls, high reserve requirements on banks and unbridled fiscal expansion which absorbs scarce financial savings.

In particular, nominal interest rate ceilings coupled with inflation, might give rise to negative real interest rates that serve to make consumption more attractive at the expense of savings. Low savings have an adverse effect on investment and capital accumulation. Conversely, higher real interest rates encourage savings and lead to a greater quantity and quality (by discouraging low-yield investment) of investment. Figure 2.1 (from Fry, 1988) and the ensuing analysis summarise the main common elements of the McKinnon-Shaw model.

Financial institutions intermediate between savers and investors, with saving being a positive function of the real interest rate at any given rate of economic growth. Financial repression which is shown by the line FF, is reflected in a fixed nominal interest rate and therefore a real interest rate of r_0 held below its equilibrium level. With the initial savings function at Sg_0, investment is limited to Io, the amount of savings evoked by the real interest rate r_0.

If the ceiling does not apply to the interest rate on loans, the borrower would have to pay the interest rate r_3, with the spread r_3-r_0 being spent on non-price competition by a more or less competitive (though regulated) banking system. Financial resources for investment would be limited to I_0, and would be expensive at interest rate r_3. Raising interest rates from FF to F^1F^1 increases saving along Sg_0 initially, and then shifts the saving function to Sg_1 as the rate of economic growth increases in response to more productive investments being undertaken. At the higher rate of interest r_1, investments with yields lower than r_1 are no longer profitable, so that borrowers undertake more productive investments. Raising the interest rate ceiling from FF to F^1F^1 increases both saving and investment to I_1. Removing financial repression as represented by a ceiling on the deposit interest rate, increases both saving and investment to their equilibrium level of I_2, with a lower cost to investors, a higher degree of productivity of investment projects and increased economic growth.

If there is a binding and effective ceiling on the loan rate of interest, risk-taking on the part of financial institutions may be discouraged and there is likely to be non-price rationing of loanable funds. There is a tendency for relatively low-yielding investments (represented by the rectangle r_0r_1pq in figure 2.1), to be financed in the presence of financial repression.

Also, with the other forms of financial repression such as credit controls, the loan rates are typically negative and encourage non-repayment, which further exacerbates the fragility of the financial system. In addition, reserve requirements on commercial banks represent a tax on the banking system. In the McKinnon-Shaw framework, financial repression manifests itself in various forms, but in the words of Fry (1988)[8], it is the real rate of interest that is the crucial factor:

> "Thus the real rate of interest as the return to savers is the key to a higher level of investment, and as a rationing device to greater investment efficiency. The increased quantity and quality of investment interact in their positive effects on the rate of economic growth. Growth in the financially repressed economy is constrained by saving; investment opportunities abound here."

The implication of the McKinnon-Shaw approach for financial policy, is that raising the

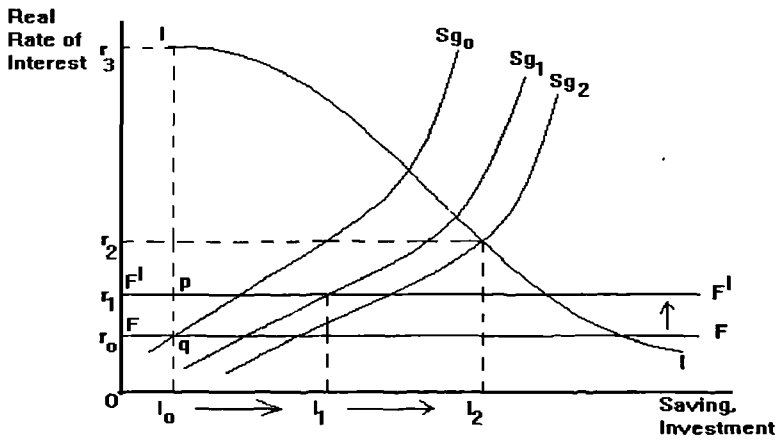


FIGURE 2.1

[8] p.19.

institutional interest rate or taking appropriate measures to reduce the rate of inflation will stimulate economic growth.

Although the models of McKinnon and Shaw are generally lumped together as illustrated in the foregoing analysis, there are noteworthy differences in their approaches. McKinnon assumes that: (1) economic agents are confined to self finance, and (2) there are substantial indivisibilities in investment, giving rise to investment expenditure that is more lumpy than consumption expenditure. The former assumption in his model derives from his observation that markets (including capital markets) in developing countries are fragmented. There is a wide divergence of technologies, resources, prices, and information confronting economic units, with little hope of a reduction in the disparities. Consequently, surplus units may be unable to find productive outlets while deficit units may exist in quiet desperation elsewhere. Resources are therefore not allocated efficiently and firms and households are largely constrained to self-finance. In effect, McKinnon's formal model is couched in terms of outside money, since economic agents are constrained to self-financing.

Because of the lumpiness of investment expenditure (assumption 2), potential investors must accumulate money balances prior to undertaking investment. Money and capital are complementary - this is McKinnon's Complementarity Hypothesis. The higher the real deposit rate of interest (or the lower the opportunity cost of accumulating real money balances), the greater is the incentive both to accumulate money (broadly defined) and to invest. There is the accompanying implication that the greater the proportion of investment in total expenditure, the greater the aggregate demand for money (because of the lumpiness of investment expenditures for which money must be accumulated).

Complementarity between money and capital is reflected in the demand for money function in which money is determined by income, the ratio of investment to income, and the real interest rate:

$$(M/P)^d = f(Y,\ I/Y,\ d - \pi^e) \qquad (2.1)$$

Where M is the stock of money (broadly defied), P is the price level, I/Y is the ratio of gross investment to GNP, and $(d - \pi^e)$ is the real deposit rate of interest (d is the nominal deposit rate and π^e is the expected inflation rate).

For McKinnon[9] complementarity works both ways: "The conditions of money supply have a first-order impact on decisions to save and invest ... In particular, if the real return on holding money increases, so will self-financed investment over a significant range of investment opportunities" (McKinnon's emphasis). Consequently, the complementarity hypothesis can also be described by the following investment function:

$$I/Y = f(\bar{r},\ d - \pi^e) \qquad (2.2)$$

where $\bar{r}$ is the average return to physical capital $\left[\frac{\delta(I/Y)}{\delta \bar{r}} > 0\right]$.

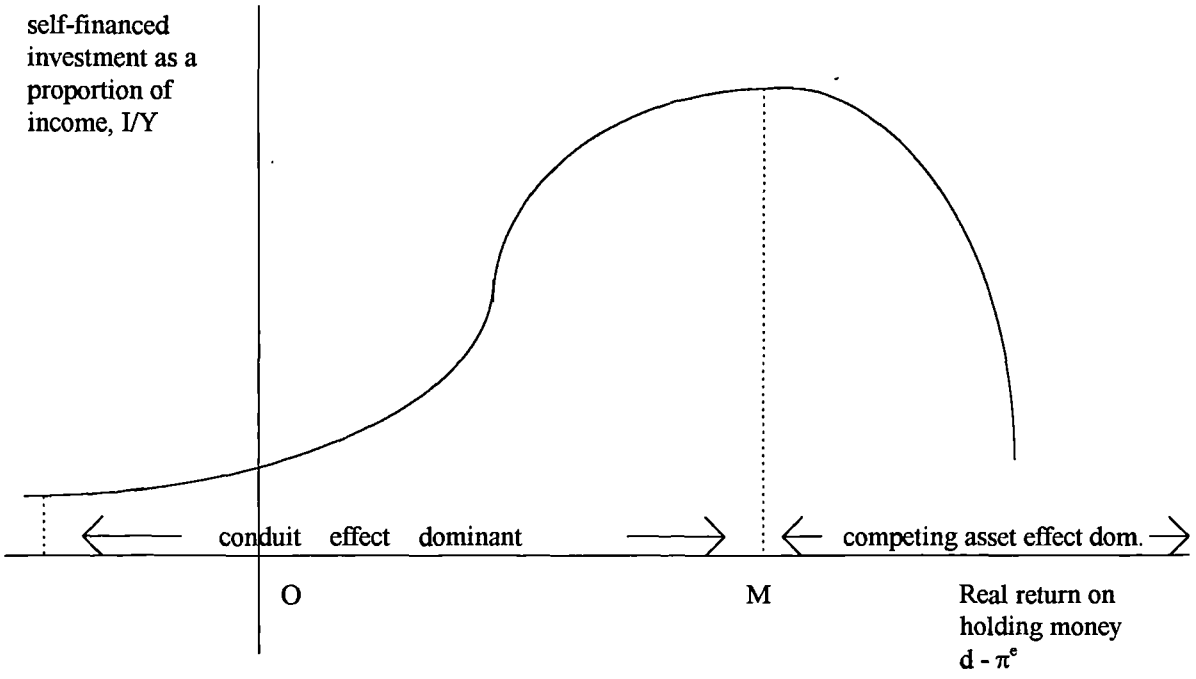
Complementarity is reflected in the partial derivatives of the demand for money function:

$$\frac{\delta(M/P)^d}{\delta(I/Y)} > 0 \text{ and } \frac{\delta(I/Y)}{\delta(d-\pi^e)} > 0 \text{ or } < 0 \qquad (2.3)$$

An increase in desired investment raises the real demand for money, while an increase in the real return on holding money raises the real demand for money and leads to more self-financed investment "over a significant range of investment opportunities" (McKinnon, op.cit). The direct relationship between the real deposit rate of interest and investment (the "conduit effect") works until the "competing asset effect" of money becomes dominant (in which case the partial derivative becomes negative). McKinnon summarises the two effects in the following diagram:

[9] Op. Cit., p.60.

FIGURE 2.2



In Figure 2.2, complementarity between money and capital exists up to a point such as M, where the real return on holding money is less than the real return on investment. Beyond point M where the real interest rate exceeds the real return on investment, it is more attractive to hold money for its own sake (i.e. for the return that it brings), rather than to accumulate it as a conduit for investment. Beyond point M money and capital become competing assets or substitutes in asset portfolios. McKinnon believes that the conduit effect exists over a significant range, and emphasises the need for high positive real interest rates to encourage self-financed investment. Even if real interest rates are in the "competing asset" range, there will in all likelihood be a positive effect on the productivity of capital, since capital with returns lower than the return on money will be weeded out.

Shaw's (1973) Debt Intermediation View utilizes a model based on inside money (i.e money backed by private sector debt). In his model investment is not primarily self-financed, and the banking system plays a crucial role in intermediating between savers and borrowers. Savings and investment are constrained in a repressed financial system, but if market forces are allowed to work, real interest rates allowed to find their equilibrium levels and financial

deepening occurs,[10] then the increased supply of financial resources in the banking system becomes available for productive investment. There is no room for complementarity as investment is not primarily self-financed, and it is financial intermediation that mobilises savings which are then ploughed into a greater quantity and quality of investment.

Shaw's demand for money function can be depicted as follows:

$$(M/P)^d = f(Y,\ v,\ d - \pi^e), \qquad (2.4)$$

where v is a vector of the real opportunity cost of holding money. In Shaw's framework, real yields on all forms of wealth (including money), have a positive effect on the savings rate, and he expects the substitution effect[11] of higher real yields to be dominant over any possible income effect.[12]

In the models of McKinnon and Shaw, a rise in the real return on holding money leads to an increase in savings which is then assumed to be a stimulus for investment and growth. McKinnon[13] goes on to argue that growth also influences savings. This is McKinnon's (1973) Virtuous Circle hypothesis which stresses the inter-dependence of savings and growth in the presence of monetary assets that possess positive yields. Not only does saving influence growth, but growth influences saving in a virtuous circle. "A healthy financial system seems necessary for 'reverse causation'[14] to be a significant economic phenomenon even though it is difficult to quantify econometrically" (McKinnon 1975).[15]

Firms and households keep their portfolios in balance by holding stocks of liquid monetary assets which have a "convenience" yield, in a balanced relationship with current income. When income grows, the propensity to save out of income increases in order to maintain the desired portfolio target or ratio of money to income. The higher the rate of economic growth and the higher the desired ratio of money to income, the more pronounced the "portfolio effect" (as McKinnon calls it) of growth on saving. McKinnon uses a modified version of the Harrod-Domar growth model to illustrate the portfolio effect, as follows:

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[10] i.e. the accumulation of financial wealth at a faster pace than non-financial wealth.
[11] i.e. of more wealth for less consumption now.
[12] i.e. of more consumption now.
[13] Op. Cit.
[14] i.e. for growth to influence saving.
[15] Op. Cit., p.129.

$$Y = \sigma k \qquad (2.5)$$

where Y is total real output and K is the stock of physical capital. Labour does not enter explicitly as a separate constraint on production, as it is assumed that technical change is sufficiently labour augmenting to maintain equilibrium. The output/capital ratio σ is therefore assumed to be constant.

$$I = \frac{\delta k}{\delta t} = sY \qquad (2.6)$$

where t is time and s is the propensity to save out of income. Differentiating (2.5) with respect to time and substituting into (2.6) gives the equilibrium growth equation:

$$\frac{\delta Y}{\delta t} = \sigma \frac{\delta k}{\delta t} = \sigma sY \qquad (2.7)$$

$$Y^* = \sigma s \qquad (2.8)$$

The rate of growth Y^*, is the product of the marginal output/capital ratio σ and the marginal propensity to save s. The propensity to save is in turn determined by Y^*, the growth rate of output, and ρ, various interacting variables (such as the real return on holding money), which influence the willingness of economic agents to hold financial (and other) assets in a "convenient" ratio to current income:

$$s = s(Y^*, \rho) \qquad (2.9)$$

where: $0 < s < 1$; $\delta s/\delta Y^* > 0$ and $\delta s/\delta \rho > 0$.
Substituting (2.9) into (2.8) gives :

$$Y^* = \sigma s\,(Y^*;\rho) \qquad (2.10)$$

The growth rate "now depends on the portfolio effect of *growth itself* operating on intended savings" (McKinnon's emphasis).[16] The virtuous circle describing the two-way interaction between growth and saving is represented by the following partial derivatives:

[16] McKinnon, Op.Cit., p.126.

$$\frac{\delta Y^*}{\delta s} > 0 \text{ and } \frac{\delta s}{\delta Y^*} > 0 \qquad (2.11)$$

Raising the real return on money increases the propensity to save directly, which in turn leads to growth (i.e. $\delta Y^*/\delta s > 0$). Higher growth then stimulates greater savings (i.e. $\delta s/\delta Y^* > 0$) this is McKinnon's "growth dividend", which occurs by virtue of the existence of organised financial markets. In the words of McKinnon (op.cit. p.129):

> "The rise in desired holdings of real money balances not only stimulates saving directly but, once growth begins, channels even more saving through "organised" financial processes."

2.2.3 Static, Dynamic and Open-Economy Extensions of the McKinnon-Shaw Model

This sub-section looks at various extensions of the McKinnon-Shaw model. Steady-State equilibrium models and dynamic extensions incorporating factors that affect the adjustment paths between equilibria, are examined. Open-economy extensions which consider the role of the exchange rate and the effects of capital flows are also considered.

The models of Kapur (1976, 1983) and Mathieson (1979, 1980) are, in the words of Fry (1988)[17] "by far the most impressive theoretical work on formal models of financially repressed developing economies". They focus on the effect of financial liberalisation on the quantity of investment, while Galbis (1977), focuses on the quality of investment. The following is an examination of the various extensions to the McKinnon-Shaw models, and of their contribution to the debate on financial intermediation and growth.

2.2.3.1 Kapur's Model of Price Stabilisation

Kapur (1976) argues that raising nominal interest rates on money holdings has a favourable effect on real output. His model of a labour-surplus developing economy has the following aggregate function:

$$\mathbf{Y = \sigma K} \qquad (2.12)$$

[17] p.28.

where Y is real output, K is total utilised fixed and working capital and σ is the output/capital ratio which is assumed to be constant. In effect, this assumption allows financial liberalisation to affect the quantity, but not the quality, of investment. The proportion of utilised fixed capital[18] to total utilised capital is α, so that the corresponding ratio of working capital to total utilised capital is $1-\alpha$. Since Kapur (1976) assumes that the developing economy is characterised by unused fixed capital, working capital provides the binding constraint on output.

The net increase in total utilised capital in real terms is given by:

$$\Delta K = \frac{1}{1-\alpha}\frac{[\Delta L - \Delta P\theta(1-\alpha)K]}{P} \qquad (2.13)$$

where θ is the fixed fraction of the cost of replacing working capital in real terms, and is provided only from bank credit. ΔP is the change in the price level, while ΔL is the nominal increase in bank loans. In the model, businessmen repay the fraction θ of bank loans used to finance working capital before borrowing afresh to finance more depleted working capital. If all working capital is used up in each time period, the additional nominal bank credit required to maintain working capital at a constant real level is given by the expression $[\Delta p\theta\ (1-\alpha)K]$.

The supply of bank credit can be linked to the stock of money in Kapur's model. Assuming a fixed required reserve ratio C/M (where C = high powered money), no excess reserves, and for simplicity, that the public hold only deposit money,[19] the ratio of bank credit to money L/M is q:

$$\mathbf{L = qM} \qquad (2.14)$$

The rates of growth of bank loans and deposit money are controlled by the Central Bank via the rate of growth of nominal reserve money, so that $\Delta C/C = \Delta L/L = \Delta M/M = \mu$ (Fry, 1988). If π is substituted for $\Delta P/P$, μ for $\Delta M/M$, qM for L, and since $\Delta K/K$ is equal to the rate of growth $\Delta Y/Y$ and σ equals Y/K, equation (2.13) can be rewritten as:

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[18] Which is combined with working capital in a constant ratio.
[19] See Fry (1988).

$$\gamma = \mu.\frac{M}{P.Y}.\frac{\sigma q}{(1-\alpha)} - \pi\theta \qquad (2.15)$$

In equation (2.15), monetary growth μ, the output/capital ratio σ, the ratio of loans to money q and the ratio of utilised fixed capital to working capital α all affect the rate of economic growth in a positive way. A higher required reserve ratio 1-q (which lowers q), the fraction of bank-financed replacement working capital θ, and the velocity of circulation P.Y/M, all affect the rate of economic growth negatively.

The critical aspect of Kapur's model is the real supply of bank credit that is available to finance net additions to working capital. The supply of bank credit is in turn dependent upon the financing proportion θ, the ratio of loans to money q, the rate of monetary growth and real demand for money. The real demand for money function is:

$$\frac{M^d}{P} = Y.e^{a(d-\pi^e)} \qquad (2.16)$$

Where M^d/P is desired real money balances, π^e is expected inflation, and d is the nominal deposit interest rate. With a constant velocity of circulation assumed by Kapur, and with $\pi^e = \pi$ in equilibrium, $\pi^e = \mu - \gamma$. Substituting this into equations (2.15) and (2.16) and then equation (2.16) into (2.15), gives an equation that depicts the relationship between monetary and economic growth:

$$\gamma = \mu.\frac{\sigma q}{(1-\alpha)}.e^{a(d-\mu+\gamma)} - \mu\theta + \gamma^{\theta} \qquad (2.17)$$

Money affects real growth via : (i) the effect of changes in the inflation rate on real money demand and real credit supply. Higher inflation reduces both, given fixed nominal deposit interest rates and also has an adverse effect on growth; (ii) the required reserve ratio which imposes a tax on financial intermediation which rises with inflation and which affects growth adversely; and (iii) the financing arrangements represented by θ[20] which imply that faster

[20] All net working-capital investment, but only a fraction of replacement working-capital are financed by banks.

monetary expansion (and inflation) places the burden of (inflation-induced) increases in the replacement cost of working-capital on the borrower, and increases the availability of bank resources to finance net working capital.

The policy implications of Kapur's model involve monetary measures aimed at enhancing economic growth. In particular, Kapur argues that a rise in the nominal deposit interest rate towards its competitive level can be expected to increase real money demand, the real supply of bank credit, real investment and growth. In addition, a reduction in or removal of the required reserve ratio lowers or removes the effective tax on the banking system and generates more resources for investment. Two shortcomings of Kapur's model are that (i) it does not have a savings function or constraints that prevent investment increasing indefinitely. "Kapur provides no indication of where the extra saving comes from to finance the extra investment" (Fry, 1988);[21] and (ii) the constant output/capital ratio prevents financial liberalisation from having an effect on the quality or efficiency of investment.

Kapur further extends his model of the basic McKinnon-Shaw hypothesis to incorporate dynamic adjustment (Kapur, 1976) and open-economy effects (Kapur, 1983). Kapur examines two sources of dynamic adjustment in the context of economic stabilisation programmes, since financial liberalisation is often pursued in such a setting (not uncommonly at the behest of the IMF). The two sources of dynamic adjustment are adaptive expectations of inflation where expected inflation is based on current inflation and money market disequilibrium which utilises an expectations-augmented Phillips curve. The strategy of reducing the rate of growth of the nominal money supply in order to control inflation, leads to a decline in the real money supply, an initial rise in the velocity of money and a fall in expected inflation. The supply of bank credit, the availability of working capital for businesses and real output all fall.

The alternative approach of raising the deposit interest rate has the effect in Kapur's model of raising the demand for money in real terms, lowering inflation by removing the excess supply of money, increasing the availability of credit for investment[22], and stimulating output. Raising the deposit rate lowers inflation and raises output, whereas reducing the money growth rate has an adverse impact on real growth.

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[21] p.36

[22] Since bank deposits increase.

Kapur's (1983) approach to financial liberalisation in the context of an open economy undergoing a programme of stabilisation, is to raise both the deposit rate of interest and, initially, the rate of growth of money providing inflation is not too high. Raising both encourages real growth while keeping inflation in check. [23] In addition, the open-economy extension of Kapur's model introduces the complexity of the exchange rate, but choosing its most appropriate level is not at all straightforward. The particular exchange rate chosen must not be incompatible with the interest rate policy, otherwise undesired capital flows may be the result. A policy of high deposit rates and exchange rate depreciation, often an aspect of stabilisation programmes, may give rise to capital inflows, particularly if the interest rate is above world levels, if the exchange rate depreciation serves to dampen expectations of a further depreciation, and if the productivity of capital is higher as a result of the financial liberalisation. Capital inflows could hinder efforts to control the money supply and inflation, so that the choice of exchange rate policy depends, inter-alia, on the initial and the target levels of inflation.

2.2.3.2 Mathieson's Model of Financial Reform and Economic Stabilisation

Like Kapur,[24] Mathieson (1980) assumes that the efficiency of investment and the currency/money ratio are constant, and that the ratio of working to total utilised capital is fixed. His production function is the same as Kapur's[25] but unlike Kapur, Mathieson assumes that fixed capital is fully utilised and that banks finance a fixed proportion θ of <u>all</u> investment - not just replacement capital. Consequently, the demand for loans in real terms is:

$$L^D/P = \theta K. \qquad (2.18)$$

The supply of loans in Mathieson's[25] model depends upon the demand for deposits and the required reserve ratio:

$$L^s/P = q(D/P), \qquad (2.19)$$

where D is the level of deposits, the real demand for which is determined positively by a multiplicative function of the real interest rate ($d-\pi^e$) and real output (Y).

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[23] Provided that the increase in the demand for money induced by the higher deposit rate, exceeds the increase in the money supply.
[24] Op. Cit.
[25] Op. Cit.

$$D/P = f(d-\pi^e)Y. \qquad (2.20)$$

In Mathieson's model, capital accumulation depends essentially upon the saving behaviour of firms, which in turn is determined by the fixed real return on capital r' and the real loan rate of interest ($l-\pi^e$):

$$\Delta K = s(r'-l+\pi^e)Y. \qquad (2.21)$$

Given the production function $Y=\sigma K$, equation (2.21) gives rise to the growth rate function:

$$\gamma = s(r'-l+\pi^e)\sigma, \qquad (2.22)$$

in which there is a positive relationship between growth on the one hand, and the real return on investment, expected inflation, and the output/capital ratio on the other, and a negative relationship between growth and the nominal interest rate on loans.

The equilibrium deposit rate in Mathieson's model is determined by the demand function of equation (2.18), and the supply functions of equations (2.19) and (2.20). If the deposit or loan rates are fixed below their free-market equilibrium levels or if there is a positive reserve requirement (without a competitive rate paid on it), then excess money or a higher inflation rate will cause $d-\pi^e$ and the real supply of loans to fall, and the real loan rate to rise. Both effects can be expected to lower investment and growth. The policy implication is that financial liberalisation in the from of abolishing interest rate ceilings to allow interest rates to find their free-market levels, and removing the reserve requirement or paying a competitive rate on reserves, will lead to an increase in investment and the rate of economic growth. Like Kapur's model, Mathieson's suffers from the shortcoming of not allowing for variations in the quality or efficiency of investment through which changes in monetary conditions can influence real growth. In addition, they both ignore the Keynesian argument to be examined later, that prior savings are not necessary for investment and growth and that savings, investment and growth are driven primarily by demand factors rather than by interest rates.

Mathieson[26] extends his equilibrium model to incorporate two sources of dynamic adjustment: adaptive expectations of inflation[27] and a declining supply of bank loans characterised by fixed interest rates for the duration of each loan. Financial liberalisation places great pressure on established financial institutions which are faced with greater competition from new entrants, but which are forced to maintain low interest rate loans for some time because the interest rates are fixed from the outset. Financial liberalisation could have an initial destabilising effect on the banking system and could even force some existing institutions into bankruptcy. Mathieson assumes that the loan rate lies initially below its free-market equilibrium level and that the economy is financially repressed with high inflation and low growth. Mathieson contends that in those circumstances, and bearing in mind the possible destabilising forces that may occur, the optional policy approach would probably be to increase the deposit and loan rates by manageable discrete amounts at a time.

In the open-economy extension to his model, Mathieson's (1979) approach to the possible destabilising effects of capital flows (see Kapur, 1983), is to argue that they may not be problematic if they are anticipated. Unlike Kapur (1983) who argues that both the deposit interest rate and the rate of money growth should be increased (initially), Mathieson's (1979) approach is to: (i) increase both loan and deposit rates in order to remove credit-rationing and increase output, but to do so moderately so as not to attract heavy capital inflows; (ii) reduce the rate of monetary growth to combat inflation; and (iii) over-depreciate the exchange rate to improve the current account and to prevent expectations of a further depreciation, thereby encouraging the moderate inflow of capital facilitated by the interest-rate policy. It is, of course, essential to co-ordinate the interest rate and exchange rate policies.

2.2.3.3 Galbis on the Efficiency of Investment

Galbis (1977) examines the effect of financial liberalisation on the efficiency of investment and consequently on economic growth, by modelling an economy of two sectors: a traditional sector with a constant but low return to capital r_1 and with investment completely self-financed; and a modern sector with a high constant return to capital. Total output is the sum of output in both sectors, while the output of each sector is generated by the capital and labour used in that sector and their respective returns:

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[26] Op. Cit.
[27] Like Kapur, Op. Cit.

$$Y = Y_1 + Y_2 = r_1K_1 + W_1N_1 + r_2k_2 + W_2N_2, \qquad (2.23)$$

where W_1 and W_2 are the respective returns (i.e wages) to labour, N. The crux of the argument is that because the return to capital in the modern sector, r_2, exceeds the return in the traditional sector, r_1, a reduction in K_1 and an increase in K_2 (with a constant total capital stock K), leads to a rise in the average output/capital ratio σ and a rise in Y.

Investment in the traditional sector is positively related to the return on capital in that sector and negatively to the real deposit interest rate, and is self-financed. The traditional sector cannot borrow from the banking system, but may acquire financial assets as part of its savings which then become available to the modern sector for investment at the higher rate of return for that sector. Thus, if the deposit interest rate were fixed by the government below its equilibrium level, a policy of financial liberalisation would raise the real deposit rate, thereby raising real money demand, reducing investment in the traditional sector and making more resources available for investment in the modern sector. Given the higher productivity of capital in the modern sector, the average productivity of investment and output for the economy as a whole would rise.

In Galbis' model where financial markets are liberalised, financial intermediation has the effect of channelling the savings of the traditional sector from less efficient investment in that sector, to more efficient investment in the modern sector. Galbis' model is not dynamic in the sense of tracing out the paths between equilibria, nor does he develop an open-economy model. Nevertheless his contribution regarding the possible effect of financial liberalisation on the quality of investment is an important one.

2.2.4 The Neo-Structuralists

The neo-structuralist models of developing economies specify what are essentially Keynesian adjustment mechanisms, and possess some of the features of the Post-Keynesian models to be examined later (see section 2.3). Adjustment in the goods market is typically effected through changes in income, while prices are determined by fixed markups on costs and wages are determined exogenously or through class conflict between capitalists and workers (see Taylor, 1983).

However, Neo-Structuralists part company with Keynesians in their analysis of the way that financial markets work. Adjustment in the money and credit markets takes place through changes in the nominal market-determined interest rate in the informal financial market. The informal market is itself of paramount importance, and financial liberalisation brought about for example by a restrictive monetary policy that increases interest rates, can lead to stagflation, especially if it is combined with a stabilisation programme that includes devaluation.

While Neo-structuralist models are critical of the efficacy of financial liberalisation and in some important respects are Keynesian in spirit, they share a fundamental similarity with the McKinnon-Shaw models in that they assume either implicitly or explicitly, that prior savings are needed for investment. In so doing, they are basically at odds with the Keynesian approach. In addition, Cho's (1990) view is that the Neo-Structuralist models are quite close to the McKinnon-Shaw models in a non-trivial way, in that they also advocate the removal of reserve requirements, and despite their misgivings about the financial liberalisation hypothesis, believe that liberalised financial markets are more efficient.[28]

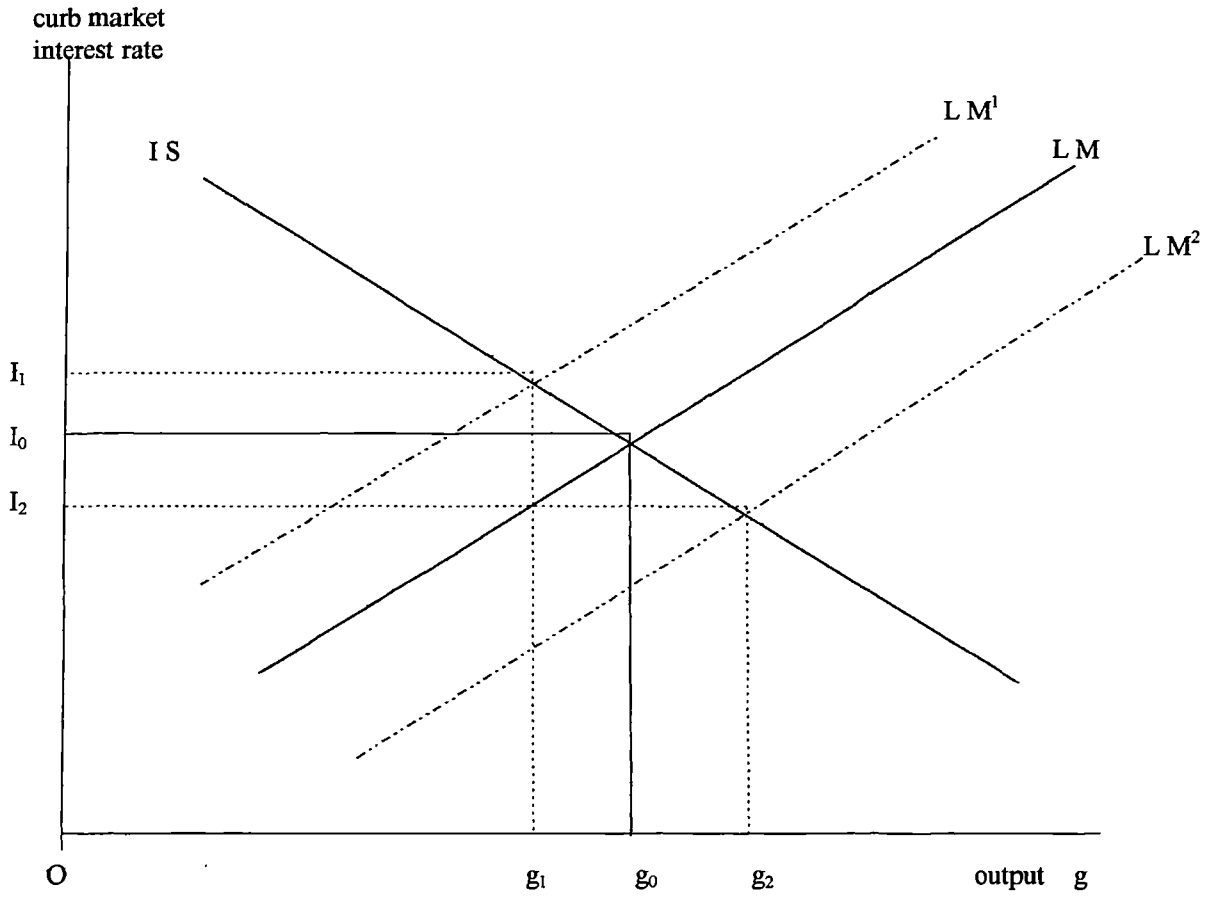
This section examines the contributions of three economists of the Neo-Structuralist 'school', namely, Taylor (1983), Van Wijnbergen (1983a and 1983b), and Buffie (1984).

In Taylor's (1983) model, households hold gold or other inflation hedges, bank deposits and curb-market loans in their portfolio of assets, compared to the two-asset portfolio (Inflation hedges and money) of the McKinnon-Shaw models. The increase in financial savings predicted by the McKinnon-Shaw models as a result of a rise in the real deposit interest rate may not mean that total credit increases. If the source of the rise in deposits is the stock of non productive assets, that is if households reduce their holdings of inflation hedges such as gold and increase their holdings of bank deposits, then the overall supply of credit to the business sector would in all likelihood increase. If, however, households increase their bank deposits at the expense of their curb-market assets then total credit would in all likelihood decline, given that there are reserve requirements on the banking system but not on the informal financial sector. In addition, a second argument of Taylor's is that increased saving lowers total demand and retards growth.

[28] However, Neo-structuralists place great emphasis on the importance of informal financial markets in economic development.

Van Wijnbergen (1983b) constructs an IS-LM model that makes use of the above argument. Households hold currency, time deposits and curb-market loans in their asset portfolios. The deposit interest rate in his model does not affect the IS schedule[29] but it does affect the LM schedule which shows money-market equilibrium. Asset holders can move freely between the formal and informal financial markets and the relative responsiveness of curb-market assets (i.e. curb-market loans) and money-market assets, determines whether the LM curve shifts up or down in Figure 2.3.

FIGURE 2.3



[29] Which depicts commodity-market equilibrium.

The demand (L^d) by households for curb-market loans is a function of the inflation rate π, the nominal curb-market interest rate i_c, the real time deposit interest rate i_{td}, and real income y:

$$L^d = f(\pi, i_c, i_{td}, y)W \quad (2.24)$$

where W is wealth. In particular, the demand for curb-market assets is related positively to the curb-market rate of interest and negatively to the bank deposit interest rate:

$$\frac{\delta f}{\delta i_c} > 0; \quad \frac{\delta f}{\delta i_{td}} < 0 \quad (2.25)$$

A rise in the bank deposit rate of interest has one of two effects. If households move into time-deposits at the expense of curb-market loans, the total supply of credit to the business sector falls (since banks are subject to reserve requirements, while the informal market is not), the LM curve shifts upwards to the left, and output declines to g_1. On the other hand, if households hold more deposits at the expense of currency, the supply of credit rises, the LM curve shifts downwards to the right, and output increases to g_2. Van Wijnbergen expects the former effect to be predominant and even to persist in the long run. Kohsaka (1984) arrives at similar conclusions. Even for an open economy undergoing a stabilisation programme that involves a tight monetary policy and depreciation of the exchange rate, growth is reduced if the effect of the depreciation on the current account of the balance of payments is outweighed by the tight monetary effect just described (Van Wijnbergen, 1983a).

Buffie (1984) argues along similar lines as Taylor and van Wijnbergen, but incorporates foreign bonds in asset portfolios which consist of currency, bank deposits, foreign bonds, and curb-market loans. Financial repression, particularly in the form of interest rate ceilings and reserve requirements, reduces the supply of credit and encourages the curb-market to expand to fill the breach. Financial liberalisation can lead to a decline in the availability of credit if curb loans constitute a sizable proportion of total loanable funds and are good substitutes for deposits. If, on the other hand, currency and foreign assets are better substitutes for deposits, then the growth in deposits arising from an increase in the deposit interest rate would not lead to a decline in credit, and financial liberalisation can be successfully pursued.

Informal credit markets are undoubtedly important in developing countries (Shaw 1973, Tun Wai 1957), but accurate information on their size and on their institutional and structural arrangements is scanty (apart from Korea. See Cho, 1989). The Neo-Structuralists implicitly or explicitly assume that credit supplied in the informal market is used overwhelmingly for capital purposes. However, that may not be so at all and if it is used mainly for consumption, then the neo-structuralist argument that liberalisation generates less resources for investment and growth, is weakened.[30]

In addition, the Neo-Structuralists do not seem to have taken account of the fact that the reserve requirement may well be used by governments for capital purposes. Indeed its use for such purposes is widespread in the developing world. If it is used for capital investment then it is not lost to investment as a whole, nor is there any 'a priori' reason to believe that it will be used any less efficiently than capital in the hands of the private sector. Its use by the government for capital purposes and the impact that it may have on growth need not be diminished.

2.3 The Post-Keynesians

This section examines the Post-Keynesian models which argue that prior-savings are not needed for investment, but that it is investment and effective demand that determine savings via the effect of the multiplier on output and on income (on which aggregate savings depends), or via the re-distribution of income among different classes with varying propensities to save. Growth can even be induced through inflation (Mundell 1965, Thirlwall 1974 and 1989), although such a policy is fraught with its own dangers and pitfalls. Inflation raises the nominal return on investment and lowers the real interest rate (and therefore the real yield on financial assets), thereby encouraging investment (Thirlwall, 1974). The high real interest rate policy advocated in the McKinnon-Shaw models might well discourage investment, effective demand, and real growth.

The model of Burkett and Dutt (1991) typifies the argument found in the Post-Keynesian literature on the effect of financial liberalisation on growth. In the credit market, the supply of credit (L^s) is determined by the proportion of free reserves lent to businesses by the banks (α), the market-determined interest rate on bank loans (i), the reserve ratio (q), and the amount of bank deposits held by households (D):

[30] See the argument in the previous two paragraphs.

$$L^s = \alpha(i)(1-q)D. \qquad (2.26)$$

Deposits are in turn determined by household wealth (W), and the real deposit interest rate (i_d), as follows:

$$D = b(i_d)W, \qquad \frac{\delta D}{\delta i_d} > 0. \qquad (2.27)$$

Raising the real interest rate increases deposits and the supply of credit. The demand for credit is constant in the short run, and is determined by the difference between the stock of physical capital (pK) and total business wealth (F):

$$L^d = pK - F = \bar{L}. \qquad (2.28)$$

In the short run the interest rate on loans does not affect the demand for credit directly, although it does affect investment through expectations and through its contribution to business costs:

$$I = I(r,i), \quad \frac{\delta I}{\delta r} > 0 \quad \frac{\delta I}{\delta i} < 0 \qquad (2.29)$$

Where I is planned investment, r is the rate of profit, and i is the interest rate on loans. Investment is not affected directly by changes in the supply of credit, but rather by the loan rate of interest.

Burkett and Dutt[31] consider the possible effect of consumption on demand (and therefore on real growth), and in their model consumption (C) depends upon income (Y) and the propensity to save ($s(i_d)$):

$$pC = [1 - s(i_d)]Y, \quad s'(i_d) > 0, \qquad (2.30)$$

[31] Op.Cit.

where P is the price level. They assume that the deposit interest rate has a positive effect on saving. Credit market equilibrium gives the following relationships:

$$\mathbf{L^s = L^d} \tag{2.31}$$

$$\mathbf{\alpha(i)(1-q)D = pK - F = \bar{L}} \tag{2.32}$$

where $\bar{L}$ is the fixed demand for credit. Substituting equation (2.27) into equation (2.32) gives:

$$\mathbf{\alpha(i)(1-q)\ b(i_d)W = \bar{L}} \tag{2.33}$$

which gives the equilibrium interest rate, i^e:

$$i^e = \frac{i}{\alpha}.\left[\frac{\bar{L}}{(1-q)b(i_d)w}\right] \tag{2.34}$$

There is a positive relationship between the equilibrium rate of interest and both the demand for credit and the reserve ratio (q in this model), and a negative relationship between the equilibrium interest rate and the deposit rate, wealth, and the proportion of free reserves loaned to businesses. These relationships feed through into the commodity market and impact on effective demand. Output (X) in the commodity market is the sum of consumption and investment:

$$\mathbf{X = C + I.} \tag{2.35}$$

Substituting equations (2.30) and (2.29) into (2.35) gives:

$$\mathbf{X = [1-s(i_d)]Y + I(r,i).} \tag{2.36}$$

In the model, income Y is divided into wage income and interest income from bank deposits:

$$Y = waX + i_dD, \qquad (2.37)$$

where w is the given money wage and a is the technologically fixed labour/output ratio. Burkett and Dutt also assume that prices are set by firms as an exogenously given markup on prime costs (z):

$$p = (1+z)wa \qquad (2.38)$$

Combining (2.36), (2.37), and (2.38), and treating income as real income gives a revised equation for equilibrium output:

$$X = [1-s(i_d)][X/(1+z) + i_d(D/P)] + I(r,i). \qquad (2.39)$$

Equilibrium in the commodity market is determined by effective demand, given the equilibrium interest rate:

$$X^e = [1-s(i_d)][X/(1-z) + i_d(D/P)] + I(r,i^e). \qquad (2.40)$$

The impact of raising the deposit interest rate on effective demand and real growth is then analysed. The actual relationship between finance (i.e. credit) and growth is complex in the Post-Keynesian approach, and depends on the actual structural and institutional arrangements of the economy concerned.

A rise in the interest rate on deposits has two possible effects in the Burkett and Dutt model. On the one hand, there is a positive effect as the supply of deposits (from equation 2.27) and credit (from equation 2.26) are increased. The equilibrium loan interest rate falls (equation 2.34), investment rises as a result of lower costs and more optimistic expectations of higher net returns on capital (equation 2.29) and output rises (equation 2.40). A positive income effect on consumption also comes into play and causes output to grow as the rise in the deposit rate increases income (from equation 2.37), consumption (equation 2.30), and output (equations 2.35-2.40).

On the other hand, a rise in the deposit rate of interest has a substitution effect that increases the propensity to save and reduces consumption (equation 2.30), which in turn reduces aggregate demand and output (equations 2.35-2.40). As a result, the rate of profit and

investment are likely to decline (equation 2.29), and as Gibson and Tsakalotos (1994) have pointed out, if as a result entrepreneurs become more pessimistic about future profits the fall in investment could be quite substantial. In addition, they stress that the inclusion in the model of accelerator effects on investment could cause the impact of financial liberalisation on investment to be strongly negative.

The ultimate effect of a rise in the deposit rate on output and growth depends on the relative strengths of the opposing effects discussed above. On the one hand, the positive effect on output depends on the responsiveness of financial savings to the deposit rate of interest, and of investment to the loan interest rate and the net profit rate. On the other hand, the negative effect on output depends on the responsiveness to the deposit rate of the propensity to save which then affects consumption and aggregate demand, and on the sensitivity of expectations to the decline in the net rate of profit.

The Post-Keynesian approach is the antithesis of models that assume that prior savings are necessary for investment. In addition, Post-Keynesian models stress the role that the propensity to save plays in the contraction of effective demand (via a reduction in consumption), in response to higher deposit interest rates. The Burkett and Dutt (op.cit) model focusses on the short-run as is typical of Keynesian models, assumes that excess capacity exists in the economy and does not make use of any accelerator effects.

Dutt (1991) extends the Burkett and Dutt (1991) model for an economy at full capacity. Financial liberalisation may lead to higher growth because of higher saving, and lower inflation because of lower excess demand. However, an increase in the rate of growth is by no means guaranteed, as increasing costs over time may undermine net returns to capital and desired investment. Also, the incorporation of an accelerator effect exacerbates the negative effects of liberalisation on growth in the presence of excess capacity. In addition, in the long run the negative effects of liberalisation are aggravated as increasing costs lead to higher prices and lower real wages, smaller aggregate demand and even lower capacity utilisation, with its concomitant negative effect on growth.

Dutt (1991) also argues that in an open economy liberalisation is often accompanied by an over-valuation of the real exchange rate, which puts pressure on the current account of the balance of payments and reinforces the negative effect of liberalisation on aggregate demand.

Gibson and Tsakalotos (1994) point out that there may be other forces at work on effective demand that exacerbate the Post-Keynesian influences and that may lead to financial instability. For instance, if banks engage in positive maturity transformation (i.e borrow short and lend long), then a rise in the deposit rate could lead to large losses if they are unable to increase the loan rate in the short run. This may well be the case if past repression subjected the banks to perverse credit controls and forced them to have a substantial proportion of their loans on a fixed interest rate basis.

Another possible adverse influence comes from the effect that higher interest rates have on increasing the public sector debt burden and therefore its deficit, if the size of the government debt is large. Liberalisation may have an even greater negative impact if taxes on the financial sector[32] are reduced, if financial institutions no longer have to hold government bonds and if the government is forced to reduce its spending.[33] However, it is noteworthy that the recent financial development literature (McKinnon 1989, the World Bank 1989) stresses the importance of bringing the public sector finances under control as a pre-requisite for successful financial liberalisation.

Beckerman (1988) argues that the equilibrium real interest rate may be very low, zero or negative, and that increasing nominal rates above the inflation rate may have adverse effects. Equilibrium rates may be low or non-positive because of low expectations or a high degree of uncertainty which depresses investment demand, but those rates may still elicit savings because individuals who may not have access to credit may wish to accumulate funds for an uncertain future or to make large purchases. Whatever the reason, depositors may be willing to accept low or even negative real interest rates. A policy of forcing them up, or 'upward financial repression',[34] may lead to instability in the banking system. If the resulting additional liquidity is not lent out then bank profitability may be affected, and if it is lent out, the probability of default is likely to be high since excessive liquidity in itself implies that insufficient profitable investment opportunities exist at the going rate.

The role of commercial banks in the actual creation of credit adds to the veracity of the Post-Keynesian approach, although the models examined thus far do not incorporate such a function. The argument that investment is not constrained by savings but by liquidity, is in the

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[32] e.g. reserve requirements.
[33] See Dutt, (1991).
[34] Which in certain situations can be used to advantage - for example, to discourage capital flight.

spirit of the Post-Keynesian approach. Asimakopoulos (1986), Davidson (1986), and Thirlwall (1989) all emphasise the role of the financial sector in creating credit irrespective of planned saving though its effectiveness in that role may well depend upon the maturity of the banking system.

2.4 *Institutional Aspects of Financial Markets: Market Failure and Instability*

The financial liberalisation models are firmly part of the Neo-Classical tradition, in which the market is sacrosanct and should be allowed to function freely under liberal institutional arrangements. Savings and investment will balance if the credit market is left alone, but the market will not clear if governments fix interest rates, impose credit controls or otherwise 'repress' it. However, the free market solution may simply not be viable and credit rationing may persist even in the absence of "deliberate" financial repression. Financial intermediaries play a key role in gathering information and reducing uncertainty (Gibson and Tsakalotos, 1994), and are important for developing high quality, long-term relations among market participants (Soskice, 1991). Consequently, they may use information gathered in the normal course of business to ration credit in their own long-term self-interest.

This section examines the role of information asymmetries and market failure in causing credit rationing to persist (even in the absence of financial repression), and in effectively defining the limits to 'financial liberalisation'. In addition, the argument that the existence of externalities and economies of scale and scope may produce allocative inefficiency, render the free market solution untenable, promote instability and retard growth, is examined. The case for some degree of government intervention in the market (through adequate bank supervision) is considered. Gibson and Tsakalotos (1994) point out that all government intervention cannot be reasonably seen as being repressive, and the very definition of the term 'financial repression' is called into question.

2.4.1 *Credit Rationing and the Limits to Financial Liberalisation*

The view that financial liberalisation leads to the disappearance of credit rationing has been challenged by Stiglitz and Weiss (1981). Market failure in the form of information asymmetries may cause credit rationing to persist, even in the absence of interest rate ceilings or other forms of governmental control.

As Stiglitz (1989) has pointed out, credit markets are not homogeneous and it is likely that borrowers may know considerably more about their individual projects than lenders. Although banks can draw up general profiles of classes of borrowers, they cannot know exactly which borrowers have high default probabilities and cannot monitor their actions (which might affect their ability to repay) perfectly. As interest rates rise the return on projects falls, and the overall riskiness of the banks' asset portfolios increases. If banks use the interest rate as a means of selecting borrowers then they may attract high-risk borrowers who may be willing to pay high rates, who know more about their projects than the bank, and who may not be too concerned about the probability of default. Consequently, when the demand for credit is buoyant a profit-maximising bank will be reluctant to raise interest rates and will ration credit.

If, as intimated above, banks are able to distinguish between classes or categories of borrowers but not between borrowers within a particular group, then it is possible that some categories may be wholly excluded from borrowing even though the projects of some borrowers within the group may have excellent potential returns. Thus the effect of credit rationing behaviour by lenders may have even more perverse effects than expected, despite the absence of official control of the financial sector. Indeed, the failure of the market mechanism or its inadequate functioning, may provide a case for appropriate government intervention.

Cho (1986) argues that the effect of imperfect information may discourage bank financing of innovative projects which are often more risky, and may therefore affect the allocative efficiency of capital[35] and economic growth adversely. Cho's[36] solution is to develop the equity markets so that they play a bigger role in financing economic development. However, equity markets are slow to get going in developing countries and their contribution to the financing of development is usually very low. Even in developed countries they generally account for less than five per cent of new net finance (Mayer, 1990), with the exception of the USA and Canada where the figure is around ten to twelve per cent.

In addition, the development along Western lines of equity and financial markets in developing countries, has been called into question (Hughes 1986, Soskice 1991, Gibson and Tsakalotos 1994). Such markets and their related institutions as found in the USA and UK, have been accused of focussing too much on short-term profits and dividends than on long-term

[35] Since industries may not have sufficient financing to enable them to take advantage of changing opportunities in a rapidly developing economy.
[36] Op. Cit.

finance,competitiveness and profitability funds for innovation and technology, and on building long-lasting relationship among institutions and businesses built on trust and dependability (as, for example, obtains in Japan and Germany). Gibson and Tsakalotos (1994), as well as practically all the early contributions covered in section 2.1.1 of this chapter, stress the importance of tailoring financial institutions to the particular needs and traditions of developing countries, and of developing appropriate relations among all the participants in the financial markets in each specific cultural context.

2.4.2 Competition, Efficiency and Bank Supervision

The financial liberalisation hypothesis constitutes part of the Neo-Classical tradition, in its implicit assumption that the magic hand of the market will restore imbalances and facilitate growth if the market is left alone by governments. As Fry (1988)[37] puts it:

> "The policy implications of these models are that economic growth can be increased by abolishing institutional interest rate ceilings, by abandoning selective or directed credit programs, by eliminating the reserve requirement tax, and by ensuring that the financial system operates competitively under conditions of free entry."

The deposit rate of interest will find its own level and increased savings, investment, and growth will ensue. Free competition among banks will reduce spreads between deposit and loan rates thereby improving "functional efficiency" (Gibson and Tsakalotos, 1994)[38] while allowing free entry into the market will help promote further competition which is seen as not just desirable, but essential for development.

Gibson and Tsakalotos (1994) argue that not only may a competitive financial system not produce allocative efficiency because of information asymmetries[39] but that possible problems related to externalities and economies of scale and scope, may promote instability and adversely affect growth and development. The free-market solution may well mean that some banks will be squeezed out - ie will fail. However, the negative externality of such failure is the social cost amplified by the fact that banks are inter-linked with other banks and financial institutions and with the real sector. The multiplier effect caused by a bank failure could be quite widespread and cause

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[37] p.420.
[38] p.615.
[39] As discussed in section 2.4.1.

untold damage and loss of confidence, especially in small economies where there are only a few banks and the bank that fails is a major one. A stable banking system really is a public good. Gibson and Tsakalotos also point out that even though there are positive externalities arising from bank financing (eg in the from of greater employment and higher aggregate demand), the free market solution may still be sub-optimal, as investment may in a sense, be 'underproduced'.

In addition, in a highly competitive banking system where banks are relatively small, neither functional nor allocative efficiency may occur: the former because it may be cheaper but beyond the capacity of the bank to provide a wide variety of services to the same customer; the latter because a small bank would be hard-pressed to simultaneously reap the benefits of diversification and of economies of scale or scope through specialisation. Banks of larger size in a less competitive environment may be able to do both.

The general point is that the competitive system underlying the financial liberalisation models may not be at all appropriate in the presence of externalities and economies of scale or scope, and may lead instead to instability and loss of confidence in the system, as some banks come under pressure from which they may not recover. A highly competitive environment forces banks to become more adventurous and take more chances, so that credit limits may be loosened, the prudential risk-return relationship compromised, speculative activity become more entrenched and profits undermined. The net result may well be a reduction in the flow of resources for investment and growth as funds are re-directed into what are perceived to be more profitable short-term ventures.

The reform of the financial system inherent in financial liberalisation policies may, for the reasons advanced above and also because of an unstable macroeconomic environment (McKinnon, 1989), lead to financial crises. Several countries that have experienced financial crises after implementing financial liberalisation policies include Chile, Uruguay, Argentina and the Philippines. There is a strong case for adequate bank supervision because of the potential external costs of such instability in the financial sector. This is even more the case where moral hazard (see Diaz-Alejandro, 1985) exacerbates the problem, that is where banks become even more irresponsible if there is a commitment from the government to intervene to prevent bank failures (there may even be formal deposit insurance schemes in operation).

Vigilant supervision of the financial system, proper bank regulation, and sound financial polices are essential co-requirements for financial reform but not all developing countries have the

resources, the knowledge, or the political will to provide them. Inadequate bank supervision would seem to have been a contributing factor in many financial crises that followed liberalisation, and the effects of such crises on the further development of the financial system itself and on economic development have been profound (see Diaz-Alejandro, 1985).

2.5 *Summary and Conclusions*

This chapter has reviewed the literature on the role of the financial system in growth and development, with special reference to the theory of financial liberalisation. Several hypotheses were analysed.

One central hypothesis is that high real interest rates increase savings, credit, investment and economic growth. Even if high interest rates might increase financial savings,[40] actual credit given by the financial system might not increase. Credit rationing might still take place even in the presence of financial liberalisation, because of institutional rigidities and market failure (see Section 2.4). In addition, if the post-Keynesians are right, then credit and investment might be driven by demand rather than by the supply of financial savings. High interest rates increase business costs and might deter investment. In addition, banks are able to create credit irrespective of the availability of financial savings. On the other hand, it is possible that high interest rates might improve the efficiency of investment by encouraging high-yield projects, which might in turn be a stimulus to economic growth (see Galbis, 1977).

The very notion that financial liberalisation is necessarily superior to government intervention in the financial markets has been questioned (see Section 2.4.2). Where the free reign of the market is, or is likely to be disruptive,[41] government involvement might be necessary to restore or maintain stability. Concerning the argument that reserve requirements deprive the banking system of resources that could be loaned out for investment, if the government uses those reserves for public investment[42] then economic growth could actually be stimulated.

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[40] One weaknes of most financial liberalisation models is that they do not distinguish between total savings and financial savings.

[41] For example competition might force the closure of small banks which in turn might have severe repercussions on business and consumer confidence in the financial system.

[42] and does so more efficiently than private investors would,

Chapters Three and Four examine the empirical evidence for Jamaica, on various aspects of the financial liberalisation hypotheses. In particular, the effect of financial liberalisation on savings, investment, growth and inflation is considered, and the validity of the postulates of the financial liberalisation theories is evaluated.

CHAPTER 3

SAVING, INVESTMENT, GROWTH AND FINANCIAL LIBERALISATION

3.1 Introduction

The thrust of this chapter is three-fold. Firstly, recent empirical evidence concerning the basic hypotheses on financial liberalisation is described in this introductory section. The international evidence on the effect of financial liberalisation on savings rates, the quantity and efficiency of investment and the rate of economic growth are considered in sub-sections (3.1.1), (3.1.2) and (3.1.3) respectively. Secondly, empirical evidence on financial liberalisation, saving, investment and growth in Jamaica is analysed in section (3.2). Sub-section (3.2.1) examines financial saving and its determinants, sub-section (3.2.2) considers the effects of financial liberalisation on total domestic savings and on private savings, sub-section (3.2.3) considers financial liberalisation and investment and sub-section (3.2.4) examines financial liberalisation and economic growth. Thirdly, our conclusions are presented and the financial and economic policy of the government of Jamaica are evaluated in section (3.3).

This section examines some of the empirical evidence on the relationship between financial liberalisation and economic growth. The evidence comprises econometric studies that purportedly analyse or explain the links among key variables and the experience of countries that have undergone liberalisation programmes (often as part of macro-economic stabilisation programmes).

The various econometric studies focus on one or more of the components of the transmission mechanism embodied in the McKinnon-Shaw models: the link between financial conditions, in particular the real deposit rate of interest and the volume of savings; the link between the availability of credit from increased savings and the quantity and efficiency of investment; and the link between the effects of liberalisation on real economic growth. Quantitative measures of financial conditions that are frequently used include the real deposit rate of interest, the density of commercial banking as measured by the population per bank branch, and some financial intermediation ratio.

The econometric evidence on the relationship between liberalisation and growth is quite mixed. There is no general consensus, and Fry's (1988)[1] view is that much of the disagreement springs from the employment of different measures for the variables used. Gibson and Tsakalotos (1994),[2] argue that, even after taking account of differences in the sample specifications (size, period, etc), the differences in the results are such that "it is difficult not to conclude that the wide variety of results reflects problems with the data. [For instance] savings are notoriously difficult to measure even in the most advanced industrial countries."

3.1.1 Financial Liberalisation and Savings Rates

Several studies look at the determinants of savings and the link between the real deposit rate of interest and the savings rate. Boskin (1978) tests a savings function for the United States and finds a positive and significant interest rate coefficient. Fry (1978) finds a positive relationship between real interest rates and savings in seven less developed Asian countries. Fry (1988) examines fourteen Asian developing countries for the period 1961-1983 using two-stage least squares on pooled time series data. He finds that on average an increase in the real deposit rate of interest by one percentage point, raises the national savings rate by about 0.1 percentage point. The result is statistically significant, but Fry acknowledges that it is not sufficiently large to use as the basis for financial policy.

Giovannini (1983), re-estimates the savings function in Fry (1978) for seven Asian countries using different periods, but finds no significant real interest rate effect on savings, as do Cho and Khatkhate (1989) for a sample of five Asian countries. De Melo and Tybout (1986), find that savings responded positively to real interest rates in Uruguay during the pre-reform period (1962-73), but not after financial liberalisation took place (post 1973). They admit, however, that their findings are not free of measurement problems. Warman (1993) and Warman and Thirlwall (1994) make the important distinction between total savings and financial savings in their empirical studies of Mexico from 1960 to 1990. They find that the rate of interest has a strong and positive effect on financial savings, but little effect on total or private savings. Warman and Thirlwall (op. cit.) offer two possible explanations. Firstly substitution between assets takes place as real interest rates change, so that a higher rate attracts into the financial sector, non-financial savings or capital held abroad. Secondly, the transfer of resources from the public to the private sector as the government pays a higher level

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[1] p.132.
[2] p.594.

of interest on its domestic private sector debt, allows the private sector to purchase financial assets.

The experience of South Korea has been invoked by researchers on both sides of the financial liberalisation debate to support their views. During the first attempt at financial liberalisation in 1965 interest rates were doubled, with the result that financial savings grew rapidly over the next five years. Cho (1989) estimates that the ratio of broad money to GNP grew from ten per cent in 1964 to thirty-five per cent in 1970. Both McKinnon (1973) and Shaw (1973) point to Korea as an example of successful financial liberalisation. Harris (1988) and Cho[3] on the other hand, argue that the extensive control of the financial sector by the government in fact created a greatly augmented pool of savings for the government to use (more or less successfully) for industrial development. In this case it was the intervention of the government in the financial markets (albeit employing the strategy of raising deposit rates), not the liberalisation of the financial markets as a whole, that seemed to have provided the impetus for growth (Gibson and Tsakalotos, 1994). The effective control of interest rates and financial markets also seems to have been effective in raising savings in Taiwan and Japan right after the Second World War.

The impact of financial liberalisation on Chile (mid 1970s to mid 1980s) seems on the whole to have been disastrous (see Gibson and Tsakalotos, 1994), with the effect of high real interest rates on savings being negligible. Despite the rapid expansion in financial intermediation and the substantial rise in real interest rates (Edwards and Edwards, 1991, and Diaz-Alejandro, 1985), the savings rate seemed to have been roughly the same as it had been during the preceding decade. McKinnon (1989) attributes the root causes of Chile's problems to an unstable macroeconomic environment reflected in poorly co-ordinated interest and exchange rate policies, an overvalued currency, and an unsustainable labour-market policy. Diaz-Alejandro points to the paucity of supervision and control of the financial system by the monetary authorities as major contributing factors. Financial liberalisation in Argentina and Uruguay in the 1970s seems to have had a similar negligible effect on savings (Diaz-Alejandro, 1985). In general, the financial liberalisation hypothesis that high interest rates increase savings seems to have little empirical support.

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[3] Op. Cit.

3.1.2 The Quantity and Efficiency of Investment

Fry's (1981) study of twelve developing Asian countries as well as Fry (1980), finds that the second component of the relationship between financial liberalisation and growth holds: that is, that a rise in the deposit interest rate towards its market-determined equilibrium level, first increases real domestic credit and then stimulates investment (Fry, 1988). The positive relationship between the deposit rate and credit availability is supported by Fry (1980, 1981), while the positive relationship between credit availability and investment is again supported by Fry (op. cit.) and Leff and Sato (1980).

The actual mechanism through which financial liberalisation is meant to affect investment (Fry, 1988)[4] is either via McKinnon's complementarity hypothesis[5] or through a savings response. Fry (1978) finds that support for the complementarity hypothesis is weak, but supports the savings-response effect (Fry, 1988). In the case of South Korea (discussed above under section 3.1.1), the strong savings response to higher interest rates in the 1960s and 1970s elicited a vigorous investment drive (led by the public sector). Post-war Japan and Taiwan had similar experiences. The situation was somewhat different in Chile. Diaz-Alejandro (1985) and Burkett and Dutt (1991) show that investment did not increase significantly. Increases in private investment were more than offset by reductions in public investment, as the latter sector brought its finances under control.

In addition, Fry finds that raising interest rates improves the efficiency of investment in Turkey (Fry, 1979) and in twelve Asian developing countries (Fry, 1981). The Asian Development Bank (1985) finds a similar relationship for eleven Asian developing countries.[6] It is found that for Turkey and for the Asian countries that an increase in the real deposit rate of interest raises the incremental output capital ratio.[7]

Warman and Thirlwall (1994) examine the possible positive effects of the rate of interest on investment via financial savings and the supply of credit to the private sector, and via the release of the constraint that savings places on investment if the real interest rate is below its equilibrium level (in a classical sense). They also consider the possible negative effect of the interest rate on investment (holding the supply of credit constant), if the rate of

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[4] p.147.
[5] i.e. that money balances must be accumulated prior to undertaking investment.
[6] Reported in Fry (1988).
[7] Provided that the average efficiency of investment is monotonically related to the incremental output-capital ratio.

interest is above its equilibrium level and is a proxy for the price of credit. They find that the net effect of the real interest rate on investment appears to be negative for Mexico: a one percentage point increase in the interest rate leads to a decline of 2.6 billion pesos in investment. They therefore conclude that the financial liberalisation hypothesis is not supported by the evidence for Mexico, but that the results are more in keeping with the Keynesian view stressing the negative net effect described above combined with a positive and significant lagged accelerator affect of growth on investment. Indeed, high real interest rates deter investment by raising the cost of capital and adversely affecting the willingness to invest by reducing expected yields. The possibility of an improvement in the productivity of investment remains, but it was not tested in the study.

3.1.3 Financial Liberalisation and the Rate of Economic Growth

The third component of the transmission mechanism in the McKinnon-Shaw hypothesis is the link between financial liberalisation and the rate of economic growth in both the short and medium term. Fry (1978, 1979, 1980, and 1981) finds that for the various Asian Developing Countries covered, a one percentage point increase in the real deposit rate of interest is associated with a rise in the rate of economic growth of about 1/2 percentage point on average (Fry, 1988).[8] He does note that 'association' does not mean 'causality', especially as there may be a myriad of other factors at work. Nevertheless, his analysis and findings lie explicitly within the McKinnon-Shaw approach, and the link that his results purport to make between financial liberalisation and growth is inescapable. The World Bank (1989) too, finds a positive link between financial liberalisation and growth for 33 developing countries over the period 1965-1985.

Jung (1986), using Granger-causality[9] tests on 56 countries, finds that financial development leads to economic growth in seven of the eight high-growth developing economies considered. Ortiz and Solis (1979) and Horiuchi (1984), conclude that there is a positive relationship between financial deepening and high interest rates on the one hand, and economic growth on the other, for Mexico and Japan (1953-78) respectively. Roubini and Sala-i-Martin (1992) find that their somewhat more elaborate model which takes into account such factors as human capital and political stability in addition to measures of financial repression, lends

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[8] p.152

[9] variable x Granger causes variable y if current and past information on x help improve the forecasts of y. This is based on predictability and is not true causation.

support to the financial liberalisation hypothesis when applied to a cross-section of developing countries.

Warman and Thirlwall (1994) test McKinnon's (1973) virtuous circle of growth model and in particular, his 'portfolio' effect of growth on the propensity to save. They find that there is no empirical support for the portfolio effect in Mexico (its coefficient in their equation turns out to be negative and close to zero), and that the real rate of interest has no effect on growth. The World Bank (1989) study of 33 countries which finds a positive relationship between real interest rates and growth, has been challenged by Dornbusch,[10] who finds that there is no such relationship when the extreme observations in the sample (ie countries with 'vastly negative real interest rates') are removed.

Gibson and Tsakalotos (1994) point out that a general criticism of empirical studies on the links between financial liberalisation and growth, is that they often suffer from omitted variables and mis-specification. In addition, financial liberalisation is often accompanied by other measures in a package of macroeconomic measures, and it is often difficult to isolate the effect of financial conditions or to establish causation.

3.2 Jamaica: The Empirical Evidence

This section tests the basic hypothesis underlying the financial liberalisation models for Jamaica: that raising the real rate of interest leads to greater saving, stimulates investment and generates economic growth. The determinants of financial saving, total domestic saving, private saving, domestic investment and economic growth for Jamaica are examined. The effect of the real interest rate on those variables is given particular attention.

In addition, three related hypotheses of the financial liberalisation school are examined. The first is Shaw's (1973) proposition that financial deepening, or the growth in financial relative to non financial assets, leads to higher real saving. The second one tested is the hypothesis held by both the McKinnon-Shaw school (Kapur 1976, Mathieson 1979 & 1980) and the Neo-Structuralists (Taylor 1983, Van Wijnbergen 1983a and 1983b, Buffie 1984) that required reserve ratios on deposit liabilities tax the banking system and reduce saving and investment. The third hypothesis analysed is the proposition that higher real interest rates lead to higher investment by improving the availability and cost of credit. In that regard,

[10] See Gibson and Tsakalotos, (1994).

McKinnon's (1973) complementarity hypothesis that money and capital complement one another, ie that prior savings must be accumulated to finance investment and that higher interest rates increase savings and investment, is considered. The alternative Keynesian proposition that investment is demand determined is examined.

The years of steady economic growth in Jamaica, 1960-1972, were followed by eight years of crisis. In its aftermath and also in the wake of the oil shocks of the 1970's, the authorities turned their attention to the mobilisation of domestic finance for development. With the assistance of the IMF and also because of growing social unrest, various attempts were made to liberalise the economy and generate greater savings. Chapter One analysed these policies, but their efficacy is again briefly considered in section 3.3, in the light of the evidence of this section on financial liberalisation in Jamaica. The balance of this section provides an empirical analysis of the determinants of financial saving, total saving, private saving, domestic investment and economic growth in Jamaica.

Unless otherwise specified, all variables are measured in real terms using annual observations for the period 1960 to 1992, or such lesser period as is allowed by the availability of data.[11] The appropriate deflator, such as the CPI or the relevant implicit GDP deflator is used. In general, the Ordinary Least Squares approach is used to estimate the models, and the adjusted R^2, t-ratios, F-statistics and Durbin-Watson statistics are reported, along with the relevant diagnostic tests for higher order serial correlation, functional form, normality, heteroscedasticity and parameter stability. The statistical software used is Microfit 386[12], and other techniques are reported when used.

3.2.1 Financial Saving And Its Determinants

Financial saving may be defined as the change in the real stock of liquid liabilities (LL)[13] net of coin, currency and demand deposits (M1). M1 is excluded because it is not expected to respond to changes in the real interest rate. Therefore, financial saving is:

$$FS_t = (LL\text{-}M1)_t - (LL\text{-}M1)_{t-1} \qquad (3.1)$$

[11] Coverage is very rarely smaller than the period 1963-1989.

[12] Version 3.22 by Pesaran, B & M H Pesaran, Oxford Univ. Press, 1991

[13] LL is defined as money and quasi money in the banking system plus demand, time and saving deposits held with the non-bank financial intermediaries.

where LL is the stock of nominal liquid liabilities deflated by the CPI and where the stock of M1 is also deflated by the CPI. FS measures the flow of savings into the financial system.

FIGURE 3.1

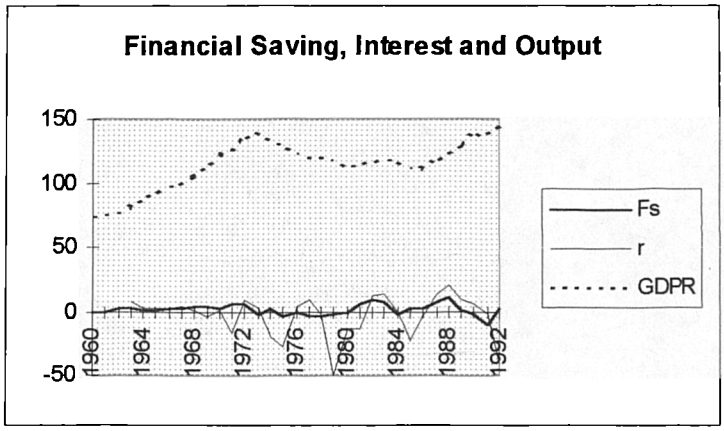


Figure 3.1 shows real financial savings (FS), real output (GDPR) and the real deposit rate of interest (r) in Jamaica over the period 1960-1992. A visual inspection indicates that the real interest rate is both negative and volatile for much of the period, particularly during the years of negative growth and high (and volatile) inflation. Consequently, it is difficult to identify any apparent relationship between the rate of interest and financial savings from the diagram. This needs to be tested in a formal way, as does any link between real output and financial savings predicted by Keynesian analysis.

The sensitivity of financial saving to the real domestic deposit interest rate (r) and to real gross domestic product (GDPR), is tested in this subsection. The real interest rate (r) is obtained from the World Bank's (1989) formula in which the nominal deposit interest rate (id) is adjusted by the rate of inflation ($\dot{p}$):

$$r = \left[\frac{1 + id}{1 + \dot{p}}\right] - 1 \qquad (3.2)$$

In order to test the attractiveness of saving at home relative to holding foreign financial assets, financial saving is also regressed on the differential between the real domestic interest rate and the real yield on foreign financial assets (rdiff) = r - r_{us} - e.[14] The variable r_{us} is the real deposit interest rate in the USA, calculated in a manner analoguous to that for the real domestic interest rate (r). The variable (e) represents the predicted rate of change of the real exchange rate (Jamaica dollars per US dollar), calculated by regressing the growth of the real exchange rate on the lagged dependent variable and taking the predicted values. The predicted exchange rate is a proxy for the expected real exchange rate.

The relationship between (r) and financial saving (fs) is expected to be positive, since the allocation of saving is expected to be influenced by the yield on various forms of financial assets. Similarly, the relationship between (rdiff) and financial saving is expected to be positive. In theory, an increase in real yields abroad makes the relative return on domestic financial assets less attractive, encourages capital flight and reduces real financial saving.

The last explanatory variable included is (PSURP), which is a proxy for uncertainty. High inflation rates and volatile exchange rates are likely to have an adverse effect on financial stability, private sector confidence, and domestic financial saving. The variable (PSURP) is generated from the residuals of the following equation (3.2), and represents the surprise (or volatility) element of inflation:

$$\underset{(-0.12)\quad(6.00)\qquad(2.33)\qquad(5.68)}{\mathbf{pcpi = -0.23 + 0.66\ (pcpi)_{t-1} + 0.15\ (m1g) + 0.28\ (eg)}} \qquad (3.3)$$

$$\mathbf{R^2 = 0.87,\quad \bar{R}^2 = 0.85,\quad F_{(3,27)} = 59.02,\quad S.E. = 6.23}$$

$$\mathbf{D.W = 1.86,\qquad n = 31}$$

Serial Correlation	$\chi^2(1)$	=	*0.01*
Functional Form	$\chi^2(1)$	=	*3.41*
Normality	$\chi^2(2)$	=	*0.57*
Heteroscedasticity	$\chi^2(1)$	=	*1.80*
Chow (Stability)	$\chi^2(4)$	=	*8.76*

[14] rdiff = r - real yield on US financial assets = r - (i_{us} - p_{us} + e) = r - (r_{us} + e) = r - r_{us} - e. The real yield on US financial assets is based on interest rates on 3-month US treasury bills.

where (pcpi) is the inflation rate based on the consumer price index, (m1g) is the growth rate of the money supply[15] and (eg) is the rate of change of the nominal bilateral exchange rate (Jamaica dollars per US dollar). The t-statistics are in brackets beneath the respective coefficients. All the variables have the expected positive signs. The coefficient on the lagged dependent variable suggests that 34 per cent of the adjustment to long-run equilibrium inflation occurs within one year. In addition, there is a positive association between the narrow money supply and inflation. An insignificant relationship was found between broader measures of money supply and inflation, suggesting that it is money as a medium of exchange rather than the asset value function of money, which is linked to inflation. The exchange rate is also significant and captures the effect of currency changes on domestic inflationary impulses. Chapter Four examines in greater detail, the determinants of inflation and its effects on the macro-economy. For present purposes equation (3.2) is used to generate the inflation surprise variable (PSURP) from the equation's residuals, for use in subsequent estimation. Equation (3.2) has stable parameters (as suggested by the Chow stability test), and is well determined as indicated by its diagnostic above.

Returning to the estimation of financial savings, the coefficient of (PSURP) is expected to be negative, since greater uncertainty is expected to have an adverse effect on financial saving. The results of the estimation of financial saving are as follows:

$$\mathbf{FSR = -9.79 + 0.11\ (GDPR) + 0.68\ (r) + 0.66(rdiff)} \qquad \mathbf{(3.4)}$$
$$\mathbf{(-2.10)\ (2.75)\qquad (2.91)\qquad (3.09)}$$

$$\mathbf{-0.24\ (PSURP)}$$
$$\mathbf{(-2.24)}$$

$$\mathbf{R^2 = 0.50,\qquad \bar{R}^2 = 0.41,\quad F_{(4,22)} = 5.58,\qquad S.E. = 2.83}$$
$$\mathbf{D.W = 2.21,\qquad n = 27}$$

Serial Correlation	$\chi^2(1)$	=	*0.51*
Functional Form	$\chi^2(1)$	=	*1.60*
Normality	$\chi^2(2)$	=	*1.11*
Heteroscedasticity	$\chi^2(1)$	=	*0.85*
Chow (Stability)	$\chi^2(4)$	=	*2.01*

[15] Defined as currency and demand deposits.

where: (FSR) represents real financial saving in millions of Jamaica dollars; (r) is the real domestic rate of interest on deposits; (GDPR) is real GDP in millions of Jamaica dollars and (PSURP) is the uncertainty variable from equation (3.3). Although the values on R^2 and $\bar{R}^2$ are not particularly high, the equation satisfies the various diagnostic tests, including those for serial correlation and parameter stability, and is well determined.

The estimation results shown in equation (3.4) indicate that all the explanatory variables are significant and have the expected signs. The real interest rate (r) exerts a positive and significant effect on real financial savings (FSR), as expected. A one percentage point increase in the interest raté (r) increases financial savings (FSR) by 0.68 million Jamaica dollars. The interest rate differential (rdiff) also exerts a significant positive effect on financial savings. An increase of one percentage point in (rdiff) increases real financial saving by J$0.66 million. This means that a rise in the foreign interest rate would encourage capital flight and lower financial savings. Financial savings are also determined by income as represented by real gross domestic product (GDPR), which was found to have a positive and significant effect. In addition, uncertainty, represented by the statistically significant variable (PSURP), discourages financial savings. When faced with uncertainty, economic agents probably hold more money for transactions purposes, given the higher cost of transactions and given the erosion in the value of financial assets.

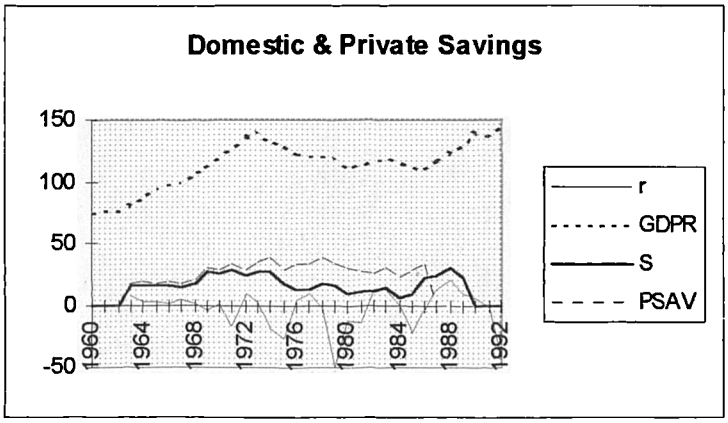
A dynamic specification of the model was tested but the lagged dependent variable was not significant, indicating a fairly rapid adjustment of real financial saving to changes in the interest rate, income, and uncertainty. In general, the real interest rate would seem to have been an important tool for increasing financial saving in Jamaica. The next sub-section examines the importance of the interest rate in stimulating total domestic saving and private saving.

3.2.2 Domestic Saving and Private Saving

This Sub-section examines the determinants of real saving and real private saving in Jamaica overe the three decades of our study. Their trends over the period are shown on Figure3.2, along with the real interest rate and real output. The shapes of the output (GDPR), total saving (S) and private saving (PSAV) graphs are broadly similar, but it is interesting that private saving exceeds total saving, particularly between 1973 and 1985. Those years incorporated the period of massive government expansion and the large public sector deficits

referred to in Chapter 1, were evidence of the substantial government dissaving which occurred.

FIGURE 3.2



One of the fundamental assumptions underlying financial liberalisation theory is that the real interest rate exerts a positive effect on savings. As described in sub-section 3.1.1, the evidence that there is any significant positive effect of interest rates on saving is weak. The hypothesis tested in this sub-section is that the real interest rate and the level of real income determine the level of real domestic saving in Jamaica.

In addition, Shaw's (1973) financial deepening hypothesis that the increase of financial relative to non-financial wealth has a positive effect on real saving, is tested. The ratio of liquid liabilities to GDP, (LLY), is used to measure the size of the financial system and the extent to which financial deepening is taking place. However, Gupta (1987) suggests that while the sign on the coefficient may indicate whether or not the financial deepening hypothesis holds, given the complexities of the financial and real economy, the size of the coefficient is meaningless in trying to determine the magnitude of the responsiveness of saving to financial deepening.

The surprise variable (PSURP), is also included in order to test its effect on saving. The results of estimating the static model are as follows[16]:

$$S = -18.34 + 0.29\,(GDPR) + 0.12\,(r) - 28.62\,(LLY) \qquad (3.5)$$
$$(-1.45)\quad (2.50)\qquad (1.34)\qquad (-1.59)$$

$$+4.28\,(er) + 0.31\,(PSURP)$$
$$(2.11)\qquad (1.34)$$

$R^2 = 47.50,\quad \bar{R}^2 = 42.62,\quad F_{(5,21)} = 2.52,\quad S.E. = 5.99$

$D.W = 1.70,\quad n = 27$

Serial Correlation	$\chi^2(1)$	=	*0.85*
Functional Form	$\chi^2(1)$	=	*0.25*
Normality	$\chi^2(2)$	=	*0.05*
Heteroscedasticity	$\chi^2(1)$	=	*0.03*
Chow (Stability)	$\chi^2(4)$	=	*6.09*

where: (S) is real total domestic saving in millions of Jamaica dollars; (GDPR) is real gross domestic product, (r) is the real interest rate , and (LLY) is the ratio of liquid liabilities to GDP and represents the financial deepening variable.

The results indicate that savings are determined by income, in keeping with Keynesian analysis. The (GDPR) coefficient is positive and statistically significant, and a one million dollar rise in real GDP increases savings by 290 thousand dollars. The propensity to save out of income seems to be a stable relationship as indicated by the Chow tests on the static equation (3.5). In addition, the rate of interest has no significant effect on total savings. This is not incompatible with our finding in the previous sub-section that the real interest rate has a positive and significant effect on financial saving, which is a subset of total saving. Higher real interest rates can lead to increased financial saving if savers substitute domestic financial for non-financial assets or for assets held abroad. Alternatively, savers might increase their holdings of financial assets held in the banking system for financial assets held in the informal financial sector. Higher interest rates might give rise to substitution among different kinds of assets rather than generating higher overall savings.

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[16] A dynamic model with the lagged dependent variable was not well-determined and failed some of the diagnostics.

The coefficient on the financial deepening variable (LLY), is negative and insignificant. This suggests that Shaw's (1973) hypothesis that financial deepening increases saving, does not hold for Jamaica. In addition, Inflationary surprises do not affect saving significantly.

A similar effect of the real interest rate (r) on private saving is obtained from the following equation:

$$\begin{aligned} \mathbf{PSAV} &= \mathbf{-6.04 + 0.23\ (GDPR) - 0.12\ (r) + 24.01\ (LLY)} \qquad \mathbf{(3.6)} \\ &\quad\ \mathbf{(0.70)\quad (3.10)\qquad (-1.94)\qquad (1.92)} \\ &\quad\ \mathbf{-0.59\ (er) + 0.39\ (PSURP)} \\ &\quad\ \mathbf{(0.43)\qquad (2.36)} \end{aligned}$$

$$\mathbf{R^2 = 0.74,\ \bar{R}^2 = 0.67,\qquad F_{(5,18)} = 10.39,\qquad S.E. = 3.84}$$

$$\mathbf{D.W = 1.47,\quad n = 24}$$

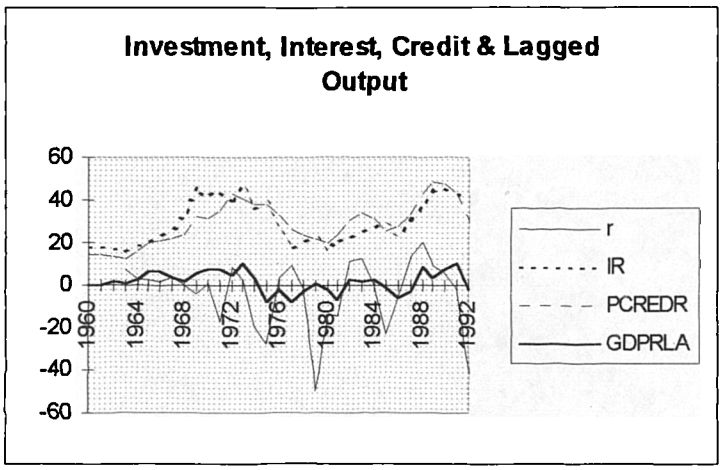
Serial Correlation	$\chi^2(1)$	=	*1.38*
Functional Form	$\chi^2(1)$	=	*1.91*
Normality	$\chi^2(2)$	=	*2.56*
Heteroscedasticity	$\chi^2(1)$	=	*0.23*
Chow (Stability)	$\chi^2(4)$	=	*4.24*

where (PSAV) represents real private sector savings and the other variables are as before. Like total savings, private savings are driven by real gross domestic product (GDPR), the coefficient of which is positive and significant. As with total saving, the rate of interest (r) and financial deepening (LLY) have no significant effect on private savings at the 5% confidence level. However, (LLY) only just fails the test of statistical significance, and at the less stringent 10% confidence level, financial deepening does have a significant effect on private savings. The growth of monetary assets relative to income does seem to encourage private savings (when the weaker test is applied). In addition, the positive effect of the uncertainty variable (PSURP) on private savings in equation (3.6), combined with the negative effect on financial savings in equation (3.3), suggests that uncertainty encourages private savings in real assets to restore savers' wealth positions, but discourages savings held as financial assets.

3.2.3 Domestic Investment

Real domestic investment (IR) experienced a rising trend during the years of steady economic growth, 1960-1972. Thereafter investment declined and remained relatively depressed for a decade and a half before recovering in the late 1980s. This is shown on Figure 3.3 along with real private sector credit (PCREDR) which supplies resources for investment in financial liberalisation analysis, and lagged changes in output (GDPRLA) which stimulate investment in Keynesian analysis. Both (PCREDR) and (GDPRLA) seem to move in the same direction as investment over the period.

FIGURE 3.3



In this sub-section the hypothesis of the financial liberalisation school that the real interest rate has a positive effect on real investment, is examined. In addition, the alternative Keynesian hypothesis that investment is largely determined by demand rather than supply (i.e. saving), is also tested. In order to test the second hypothesis, the lagged change in real output, ie the lagged accelerator (GDPRLA)[17] is included in the regression equation for investment, as an explanatory variable. The lagged accelerator is used on the assumption that it takes investors some time to adjust the capital stock to the new level of demand. If investment in Jamaica is demand sensitive, the coefficient on gdpla is expected to be positive and significant.

[17] $GDPRLA = GDPR_{t-1} - GDPR_{t-2}$

With regard to the first hypothesis of a positive correlation between the real interest rate and investment, there are two purported effects. The first one is the positive effect of the interest rate on the availability of credit, via financial saving. The higher the real deposit rate of interest, the greater the amount of saving and the greater the amount of credit available for investment. This in turn reduces the price of credit, lowers the market clearing rate of interest, and increases investment.

The second effect depends on the level of the real interest rate in relation to its equilibrium level (in a Classical sense). The real interest rate is positively correlated with investment if the former is below its equilibrium level, since investment is constrained by saving. Raising the real rate of interest increases the quantity of saving and investment.[18] However, if the interest rate lies above its equilibrium level, the rate of return on investment becomes less attractive than the yield on financial assets. Investment is then negatively correlated with the interest rate, and lowering the rate would then elicit more investment.

The overall effect of the real interest rate on investment is tested in stages. Our earlier equation (3.3) showed that the real deposit interest rate has a positive and significant effect on financial saving. Financial saving is the change in the stock of liabilities (net of M1) that largely comprise the counterpart to credit in the financial system's balance sheet. Therefore, financial saving in turn is expected to have a positive effect on credit availability. This is tested by regressing the change in the stock of real credit (DPCREDR) on financial saving. We also test the financial liberalisation contention that a higher reserve requirement taxes the banking system and reduces the availability of credit to the private sector. The regression results are as follows:

$$\mathbf{DPCREDR = -15.65 - 0.50\ (PCREDR)_{t-1} + 0.43\ (FSR) + 0.30\ (GDPR)} \qquad \mathbf{(3.7)}$$

$$\mathbf{(-2.90)\quad (-4.89)\qquad\qquad (3.45)\qquad (4.97)}$$

$$\mathbf{-0.32\ (GDEFR) - 113.07\ (RR) - 0.09\ (PSURP)}$$

$$\mathbf{(-3.28)\qquad\qquad (-0.74)\qquad (-1.31)}$$

[18] The lower the rate, the smaller the amount of saving and the higher the market clearing loan rate of interest. Blejer and Khan (1984) and Fry (1988) argue that the real deposit rate could then act as an inverse proxy for the real loan interest rate and should have a positive impact on investment.

$R^2 = 0.84$, $\bar{R}^2 = 0.78$, $F_{(6,18)} = 15.40$, S.E. = 1.84

D.W = 2.36, n = 25

Serial Correlation	$\chi^2(1)$	=	*1.09*
Functional Form	$\chi^2(1)$	=	*0.90*
Normality	$\chi^2(2)$	=	*1.57*
Heteroscedasticity	$\chi^2(1)$	=	*1.42*
Chow (Stability)	$\chi^2(4)$	=	*2.34*

where (DPCREDR) is the change in real private sector credit (PCREDR), (GDEFR) is the real government deficit and the other variables are as before. As expected, financial savings (FSR) have a positive and significant effect on the change in real credit to the private sector. Required reserves (rr) have no significant effect on changes in private credit. Required reserves do not seem to tax the banking system as argued by financial liberalisation theory and in particular, banks may be able to create credit irrespective of the level of the reserve requirement (see Asimakopoulos 1986, Davidson 1986 and Thirlwall 1989). Demand conditions embodied in real gross domestic product (GDPR) have a significant positive impact on private credit, while the coefficient on private credit lagged one period $(PCREDR)_{t-1}$ indicates that 50 per cent of the adjustment to long-run equilibrium takes place within one year. The real government deficit (GDEFR) has a significant negative effect on private credit possibly because the government may compete with the private sector for financial resources. Chapter Four analyses in greater detail the role of the public deficit and the possible crowding out of private credit and private investment by the public sector.

Having found a significant positive relationship between financial savings and real credit changes, investment is then regressed on real credit to the private sector, the real interest rate, and the lagged accelerator. The objective is to test the extent to which investment is determined by the availability of credit, the price of credit with the real deposit interest rate acting as an inverse proxy for the loan rate, and demand conditions represented by the lagged accelerator. The results are as follows:

$$IR = 2.54 + 0.36\,(IR)_{t-1} - 0.15(r) + 0.54(PCREDR) - 0.05(pcpi) \qquad (3.8)$$
$$(0.85)\quad (2.44)\qquad (-2.06)\quad (3.48)\qquad\qquad (-0.71)$$

$$+ 0.56\,(GDPRLA)$$

(2.96)

$R^2 = 0.85$, $\bar{R}^2 = 0.81$, $F_{(5,24)} = 26.51$, S.E. = 4.50

Durbin-h = 0.55, n = 30

Serial Correlation	$\chi^2(1)$	=	*0.02*
Functional Form	$\chi^2(1)$	=	*0.38*
Normality	$\chi^2(2)$	=	*0.69*
Heteroscedasticity	$\chi^2(1)$	=	*0.45*
Chow (Stability)	$\chi^2(4)$	=	*4.53*

where: (IR) is real gross domestic investment in millions of Jamaica dollars; (GDPRLA) is the lagged accelerator; (pcpi) is the inflation rate and the other variables are as before.

The results show that the availability of real credit to the private sector (PCREDR) has a significant positive effect on real investment (IR). On the other hand, the real interest rate has a negative and significant effect on investment, holding constant the supply of credit (which is positively related to the interest rate). Relating this result to the classical argument discussed earlier, either the rate of interest has been consistently above its equilibrium level, or saving is not determined by the real interest rate. Equation (3.5) above found that the interest rate is not significant in the determination of saving. With regard to investment, a rise of one per cent in the rate of interest in equation (3.8), reduces investment by J$0.150 million. Higher real interest rates in Jamaica deter investment by raising the cost of capital and reducing the willingness of economic agents to invest by lowering expected yields.

In addition, the results show that the lagged accelerator (GDPRLA) has a significant positive effect on investment. Supply conditions have a significant impact on investment via the availability of credit, but it is demand conditions via the lagged accelerator that have the most significant positive impact on investment. A one million dollar increase in the lagged flow of income leads to an increase in investment of five hundred and sixty thousand Jamaica dollars, ceteris paribus. Inflation does not seem to have any significant effect on investment. The effect of inflation on investment and growth is examined in greater detail in Chapter Four.

The negative effect of the real interest rate on investment does not support McKinnon's Complementarity Hypothesis that money and capital are complementary. According to that

hypothesis, money balances have to be accumulated (via saving) to finance investment, because of the lumpiness of investment. Therefore the real interest rate should have a positive impact on both money and capital. Our results indicate that the real interest rate exerts a positive effect on financial saving, but a negative effect on investment, so that money and capital in Jamaica are substitutes not complements.

3.2.3.1 Financial Liberalisation and the Productivity of Investment

Our findings above do not support the financial liberalisation hypothesis that higher interest rates stimulate investment. On the contrary, as demonstrated by the result in equation (3.8), raising the interest rate has a negative effect on investment in Jamaica for the reasons cited above. However, the question of whether or not financial liberalisation improves the quality of investment remains to be tested. The work of McKinnon(1973), Shaw(1973) and Galbis(1977) suggests that raising the interest rate to its equilibrium level in their models has the effect of weeding out investment projects with lower returns, thereby ensuring that those with higher returns receive financing. Raising the real interest rate to its competitive free market level improves the average efficiency of investment in financial liberalisation models.

Fry (1979) finds a negative relationship between the real deposit interest rate and the incremental capital-output ratio (iocr) for Turkey for the period 1950-1977, which suggests that raising the real interest rate improves the output-capital ratio and therefore the efficiency of investment. The incremental output capital ratio is used as a proxy for the average efficiency of investment to which it is assumed to be monotonically related. Fry (1995) obtains a similar relationship between interest rates and investment productivity for 10 Asian countries over the period 1961-1988, as does the Asian Development Bank[19] for a sample of 11 Asian countries.

This sub-section tests the hypothesis that raising the real interest rate improves the productivity of investment in Jamaica. In addition, Fry(1995) argues that financial intermediaries may allocate funds more efficiently than other allocative mechanisms, so that the development of the financial sector or financial deepening may also improve the efficiency of investment.The assumption is that financial intermediaries are good at channelling investible funds to the most efficient investors and to projects with superior returns. The effect of financial deepening on the productivity of investment is also tested in this sub-section, by

[19] reported in Fry (1995)

regressing the incremental output-capital ratio on our financial deepening variable, the ratio of liquid liabilities to gross domestic product (defined earlier).

In addition, the incremental output-capital ratio (measured by dividing the annual change in output by current investment for each year of the time series), is regressed on the rate of growth of output in order to test Leibenstein's (1966) contention that the growth rate has a positive effect on the productivity of investment. Leibenstein argues that the rate of investment is more stable than that of output, because public investment is not dependent on output growth and may change more slowly. Also, private investors are cautious and take account of the behaviour of their competitors, and this also helps to make the investment rate relatively stable. Consequently, in a growing economy output changes by more than investment, so that growth has a positive effect on the productivity of investment.

The results of testing the effects of the real deposit interest rate (r), the financial deepening ratio (LLY) and the real growth rate (gdprg) on the output-capital ratio are as follows:

$$\underset{(-0.79)\ (-0.27)\ (0.13)\qquad (15.65)\qquad (-1.85)}{\mathbf{IOCR = -0.04 - 0.22\,(r) + 0.01(LLY) + 0.04(gdprg) - 0.01(PSURP)}} \qquad \textbf{(3.8a)}$$

$$\mathbf{R^2 = 0.94,} \qquad \mathbf{\bar{R}^2 = 0.93,} \qquad \mathbf{F_{(4,\,23)} = 85.97,} \qquad \mathbf{S.E. = 0.05}$$

$$\mathbf{D.\,W. = 1.66,} \qquad \mathbf{n = 28}$$

Serial Correlation	$\chi^2(1)$	=	*0.62*
Functional Form	$\chi^2(1)$	=	*3.76*
Normality	$\chi^2(2)$	=	*0.99*
Heteroscedasticity	$\chi^2(1)$	=	*3.33*
Chow (Stability)	$\chi^2(4)$	=	*2.77*

Where all the diagnostic criteria are satisfied. The coefficient on the rate of interest (r) is not significant and has a sign opposite to that predicted by financial liberalisation theory. Raising the real interest rate does not improve the productivity of investment. Similarly, the coefficient on (LLY) is insignificant, implying that financial deepening has no significant effect on investment productivity in Jamaica. This finding is consistent with the view of Stiglitz (1989)

reviewed in Chapter 2, that credit markets in developing countries are quite heterogenous and banks may not possess adequate knowledge about particular projects or investors they appraise for financing. Consequently, they may be unable to allocate investible funds efficiently. It would seem, at least for Jamaica, that financial deepening does not improve the productivity of investment. On the other hand, the coefficient on real growth (gdprg) is positive and significant, which supports Leibenstein's [20] contention that growth improves the productivity of investment. In short, investment productivity in Jamaica does not seem to be determined by financial variables (the rate of interest and the financial deepening rartio), but the evidence suggests that it is significantly and positively influenced by the real growth rate.

3.2.4 The Determinants of Economic Growth

In this sub-section, an endogenous saving model adapted from McKinnon's (1973) Virtuous Circle model is used to examine the determinants of economic growth. The adapted model follows Warman (1993) and Warman and Thirlwall (1994), which in turn make use of McKinnon's model of interdependence between saving and growth.

In McKinnon's model, not only does saving influence growth, but growth influences saving in a virtuous circle. McKinnon emphasises the importance of the financial system in enabling growth to influence saving. He calls this the Portfolio Effect:

> "a healthy financial system seems necessary for 'reverse causation' (for growth to influence saving) to be a significant economic phenomenon even though it is difficult to quantify econometrically" (McKinnon 1973, p.129).

McKinnon uses a modified version of the Harrod-Domar growth model, as follows:

$$\mathbf{Y = \sigma K} \qquad \textbf{(3.9)}$$

where Y is total real output and K is the stock of physical capital. Labour does not enter explicitly as a separate constraint on production, as it is assumed that technical change is sufficiently "labour augmenting" to maintain equilibrium. The output/capital ratio s is therefore assumed to be constant. Saving S, is a fixed proportion of real income (sY) and is equal to investment I. Therefore:

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[20] Op.Cit

$$I = \frac{dk}{dt} = sY = S \tag{3.10}$$

where t is time and s is the propensity to save out of income. Differentiating (3.9) with respect to time and substituting into (3.10) gives the equilibrium growth equation:

$$\frac{dY}{dt} = \sigma \frac{dk}{dt} = \sigma sY \tag{3.11}$$

$$\Rightarrow g = \sigma s \tag{3.12}$$

The rate of growth g, is the product of the marginal output/capital ratio σ and the marginal propensity to save s. The propensity to save is in turn determined by g, the growth rate of output, and ρ, various interacting variables (such as the real return on holding money) which influence the willingness of economic agents to hold financial and other assets in a "convenient" ratio to current income:

$$s = s(g, \rho) \tag{3.13}$$

where $0 < s < 1$ and $ds/dg > 0$.
Substituting (3.13) into (3.12) gives :

$$g = \sigma s (g,\rho) \tag{3.14}$$

For our purposes, the real rate of interest may be uncoupled from the composite variable ρ, so that equations (3.13) and (3.14) become respectively:

$$s = s(g, r, \rho) \tag{3.15}$$

$$g = \sigma s(g, r, \rho) \tag{3.16}.$$

The growth rate "now depends on the portfolio effect of *growth itself* operating on intended savings" (McKinnon, op.cit. p.126)[21]. The virtuous circle describing the two-way interaction between growth and saving is represented by the following partial derivatives:

$$\frac{dg}{ds} > 0 \text{ and } \frac{ds}{dg} > 0 \qquad \textbf{(3.17), (3.18)}$$

Economic agents keep their portfolios in balance by holding stocks of liquid monetary assets which have a "convenience" yield, in a balanced relationship with current income. In order to satisfy this condition, higher growth rates require higher savings rates. The Portfolio Effect, i.e. the effect of growth on the propensity to save, is influenced positively by the state of development of the financial system. The more developed it is, including the existence of positive real deposit interest rates, the more attractive is the inducement to hold financial assets relative to income, and the higher the propensity to save, s. Equilibrium growth is attained when the actual growth rate generates desired saving sufficient to support the investment necessary for that rate of growth. To prevent explosive growth in the model and to ensure a stable equilibrium, the portfolio effect of growth on saving $\frac{ds}{dg}$ is constrained to be less than unity or less than the capital/output ratio ($1/\sigma$).

The variable ρ in equation (3.15) can be further expanded to include the rate of growth of real exports x, and the ratio of foreign savings to GDP, (fsy):

$$\mathbf{S = s(g, r, x, fsy, \rho)} \qquad \textbf{(3.19)}$$

The growth rate of both exports and foreign saving can be expected to relieve the foreign exchange and saving constraints on growth experienced by many developing countries (McKinnon 1973, Papanek 1973, Thirlwall 1982, and Thirlwall and Hussain (1982). The reduced form growth equation to be estimated with the expanded number of variables, makes use of the national accounting identities and is obtained as follows:

$$\mathbf{PS = sY} \qquad \textbf{(3.20)}$$

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[21] McKinnon's emphasis.

where PS is private saving, s the propensity to save from equation (3.19), and Y is real income. Substituting s from equation (3.19) gives

$$\mathbf{PS} = (\alpha_1 \mathbf{g} + \alpha_2 \mathbf{x} + \alpha_3 \mathbf{r} + \alpha_4 \mathbf{fsy} + \alpha_5 \rho)\mathbf{Y} \qquad \textbf{(3.21)}$$

Since Y = C + I + X - M from the national accounts identity[22] and Saving S equals Y - C,

$$\mathbf{S} = \mathbf{I} + (\mathbf{X} - \mathbf{M}) = \mathbf{PS} + \mathbf{GS} = \mathbf{PS} + (\mathbf{T} - \mathbf{G}) \qquad \textbf{(3.22)}$$

where GS is government saving, T represents government revenue and G government expenditure. From equation (3.22)

$$\mathbf{PS} = \mathbf{I} + (\mathbf{X} - \mathbf{M}) - (\mathbf{T} - \mathbf{G}) \qquad \textbf{(3.23)}$$

$$\mathbf{I} = \mathbf{PS} + (\mathbf{M} - \mathbf{X}) + (\mathbf{T} - \mathbf{G}) \qquad \textbf{(3.24)}$$

That is, private saving, foreign saving and government saving comprise the sources of finance for investment. Substituting (3.20) into (3.24) gives:

$$\mathbf{I} = \mathbf{sY} + (\mathbf{M} - \mathbf{X}) + (\mathbf{T} - \mathbf{G}) \qquad \textbf{(3.25)}$$

Substituting $I = \frac{dk}{dt}$ from (3.10) into equation (3.11) gives

$$\frac{dy}{dt} = \sigma I \qquad \textbf{(3.26)}$$

Substituting (3.25) into (3.26) gives:

$$\frac{dy}{dt} = g = \sigma\left[sY + (M - X) + (T - G)\right] \qquad \textbf{(3.27)}$$

---

[22] where C and I are aggregate consumption and investment respectively, and X and M represent exports and imports respectively.

$$g = \sigma s + \sigma (fsy) + \sigma g s \quad (3.28)$$

where g is the real (percentage) growth rate of output; (fsy) is the foreign saving ratio; and (gs) the government saving ratio. From equation (3.21), $s = (\alpha_1 g + \alpha_2 x + \alpha_3 r + \alpha_4 (fsy) + \alpha_5 \rho)$ which gives:

$$g = \beta_1 x + \beta_2 r + \beta_3 gs + \beta_4 fsy + \beta_5 (\rho) \quad (3.29)$$

where :

$$\beta_1 = \frac{\sigma\alpha_2}{(1-\alpha_1\sigma)} \quad (3.30)$$

$$\beta_2 = \frac{\sigma\alpha_3}{(1-\alpha_1\sigma)} \quad (3.31)$$

$$\beta_3 = \frac{\sigma}{(1-\alpha_1\sigma)} \quad (3.32)$$

$$\beta_4 = \frac{(1+\alpha_4)}{(1-\alpha_1\sigma)} \quad (3.33)$$

$$\beta_5 = \frac{\sigma\alpha_5}{(1-\alpha_1\sigma)} \quad (3.34)$$

The alphas are the structural parameters and σ is the productivity of investment. Predicted inflation[23] (ppred) as a proxy for expected inflation, may be used to capture the influence of the "other" factors ρ that influence the willingness of economic agents to hold financial and non-financial assets relative to income. Equation (3.29) may then be written as (3.29a): $g = \beta_1 x + \beta_2 r + \beta_3 gs + \beta_4 fsy + \beta_5 (ppred)$. The estimation results of the growth equation (3.29a) are as follows:

[23] Predicted inflation is obtained from the forecasts of inflation in equation (3.2).

$$g = 5.49 + 0.10\,(x) - 0.02\,(r) + 0.38\,(gs) + 0.31\,(fsy) - 0.24\,(ppred) \qquad (3.35)$$
$$(4.82)\ (2.39)\quad (-0.25)\quad (3.71)\quad (2.46)\quad (-2.87)$$

$R^2 = 0.71$, $\bar{R}^2 = 0.64$, $F_{(5,21)} = 10.13$, S.E. = 2.63

D.W = 1.56, n = 27

Serial Correlation	$\chi^2(1)$	=	*1.17*
Functional Form	$\chi^2(1)$	=	*0.03*
Normality	$\chi^2(2)$	=	*1.10*
Heteroscedasticity	$\chi^2(1)$	=	*1.71*
Chow (Stability)	$\chi^2(4)$	=	*6.81*

where: (g) is the rate of growth of real output in percentage terms; (x) is the rate of growth of real exports; (gs) is the ratio of government saving to GDP; (fsy) is the foreign saving ratio approximated by the negative of the balance of payments current account balance over GDP; r is the real deposit rate of interest; and ppred is the predicted inflation rate.

All the variables apart from the real interest rate are significant and have the expected signs. The rate of growth of exports is positive and significant, reflecting its importance in financing imports of intermediate and capital goods used as inputs in domestic production. In addition, Thirlwall (1982) and Thirlwall and Hussain (1982) have shown that a virtuous circle can exist between exports and growth as investment in export industries increases both productivity and diversification and leads to a rise in the income elasticity of demand for exports.

Some researchers (McKinnnon 1973, Warman 1993), have found that foreign saving exerts a much stronger influence on growth than domestic saving. The impact of both foreign and government saving on growth in Jamaica is positive and significant, but the results indicate that the impact of the latter is stronger. An adverse effect on growth can be expected if there is significant dis-saving by the government. Chapter Four analyses the effect of the government deficit (or negative savings) on growth in greater detail.

The coefficient on the real interest rate is negative and insignificant, and does not support the financial liberalisation hypothesis that higher real interest rates stimulate growth.

McKinnon's Portfolio Effect of growth on the propensity to save is tested below. The coefficients of equation (3.21) on the propensity to save are calculated using equations (3.30) to (3.34). The incremental capital/output ratio is obtained from equation (3.8), amended by the replacement of the lagged accelerator by the change in output. The results and diagnostic tests are summarised as follows:

$$\mathbf{IR = -0.01 + 0.49\ (IR)_{t-1} - 0.12(r) + 11.24\ (DGDPR) + 0.46\ (PCREDR)} \qquad \mathbf{(3.36)}$$

$$\mathbf{(-0.01)\quad (4.03)\quad (-2.42)\quad (5.12)\quad (3.54)}$$

$$\mathbf{+ 0.10\ (PSURP)}$$

$$\mathbf{(0.81)}$$

$$\mathbf{R^2 = 0.90,\ \bar{R}^2 = 0.88,\qquad F_{(5,24)} = 41.88,\qquad S.E. = 3.69}$$

$$\mathbf{Durbin\text{-}h = -0.25,\qquad n = 30}$$

Serial Correlation	$\chi^2(1)$	=	*0.11*
Functional Form	$\chi^2(1)$	=	*3.82*
Normality	$\chi^2(2)$	=	*2.33*
Heteroscedasticity	$\chi^2(1)$	=	*2.16*
Chow (Stability)	$\chi^2(4)$	=	*2.89*

where (DGDPR) is the change in real output and the other variables are as before. The model is well determined and satisfies the diagnostic tests as indicated above. The estimated capital productivity ratio σ is 0.09.

From equation (3.35), $\beta_1 = 0.10$, $\beta_2 = -0.02$, $\beta_3 = 0.38$, $\beta_4 = 0.31$ and $\beta_5 = -0.24$. Using equations (3.30) to (3.34), the estimated coefficients of equation (3.21) are therefore:

$$\hat{\alpha}_1 = \frac{1}{\sigma} - \frac{1}{\hat{\beta}_3} = 8.480 \qquad \mathbf{(3.36)}$$

$$\hat{\alpha}_2 = \frac{\hat{\beta}_1}{\hat{\beta}_3} = 0.263 \qquad \mathbf{(3.37)}$$

$$\hat{\alpha}_3 = \frac{\hat{\beta}_2}{\hat{\beta}_3} = -0.053 \qquad (3.38)$$

$$\hat{\alpha}_4 = \frac{\hat{\beta}_4}{\hat{\beta}_3} = 0.816 \qquad (3.39)$$

$$\hat{\alpha}_5 = \frac{\hat{\beta}_5}{\hat{\beta}_3} = -0.632 \qquad (3.40)$$

Substituting the above results into equation (3.21) gives the equation for the propensity to save:

$$s = 8.480\,(g) + 0.263\,(x) - 0.053\,(r) + 0.816\,(fsy) - 0.632\,(ppred) \qquad (3.41)$$

The results indicate that there may be a Portfolio Effect of growth on the propensity to save in Jamaica, since the coefficient on g is positive. This is consistent with our earlier finding that saving is positively related to output and is therefore demand determined. The rate of interest does not have a positive effect on the saving rate, this being in keeping with our previous findings. However, the rates of growth of exports and foreign saving have positive effects on the saving rate, while expected inflation has a negative effect. The absence of a positive relationship between the interest rate and savings therefore seems to unequivocally confirm our earlier findings. There is some instability in the other coefficients when viewed from the point of view of McKinnon's model[24], and care must be taken in interpreting their magnitudes. However, the coefficient on growth is particularly strong and the sign is consistent with earlier findings that saving is demand determined. Only the coefficients on predicted inflation and the interest rate in equation (3.41) satisfy McKinnon's stability condition that they must not exceed the value of the capital/output ratio.

3.3 Summary and Conclusions

Several hypotheses underlying the various models of financial liberalisation were tested in this chapter, using data on the economy of Jamaica for the period 1960-1992. In the course of the analysis the determinants of real saving, financial saving, investment and economic

[24] where the coefficients are constrained to be less than one or σ to prevent explosive growth in the model

growth were explored, with special attention being given to the effects on them of financial variables. The rate of interest in particular plays a key role in the theories of financial liberalisation.

One of the central propositions of the theories of financial liberalisation is that raising the real deposit rate of interest increases the level of domestic saving. It was found that the real rate of interest in Jamaica was insignificant in the determination of both total and private saving. Saving and private sector saving were instead determined by real income, in keeping with the Keynesian school of thought. The real deposit rate of interest and real income were both found to be positively correlated to, and significant in explaining real financial saving.

The positive and significant relationship between the interest rate and financial saving and the insignificance of the interest rate in explaining total saving can be reconciled. While higher interest rates had no effect on total saving, their positive effect on financial saving meant that savers substituted financial for non-financial domestic assets or assets held abroad, or increased their holdings of financial assets in the banking system at the expense of assets held in the informal financial sector.

Shaw's (1973) hypothesis that financial deepening, the accumulation of financial assets relative to real wealth, increases real saving, does not hold for Jamaica. However, there is some evidence that financial deepening may encourage private saving. Also, a higher required reserves ratio on deposit liabilities of the banking system was found to have no significant effect on credit and therefore did not support the view of the financial liberalisation "school" that reserve requirements reduce credit availability.

Investment in Jamaica was found to be determined partly by supply and partly by demand factors. In line with Keynesian thinking, the most significant determinant of investment is the lagged accelerator, implying that investors take time to respond to changes in demand. Supply conditions were also found to be significant. Credit availability which in turn is positively correlated with financial saving was found to be important in generating investment. However, although the rate of interest was found to have a positive impact on investment via financial saving and credit, it was found to have a significant direct negative effect on investment, probably because higher rates raise the cost of financing investment and have an adverse effect on the willingness of economic agents to invest, by lowering expected yields. In addition, no support was found for the contention of financial liberalisation analysis (Galbis

1977, McKinnon 1973, Shaw 1973), that financial variables such as the real rate of interest and the financial deepening ratio improve the productivity of investment. Instead, the empirical evidence supports Leibenstein's (1966) argument that the real growth rate has a positive effect on the productivity of investment.

Additionally, McKinnon's (1973) Complementarity Hypothesis that money and capital are complementary since money balances have to be accumulated to finance investment, is not supported by the evidence. In the case of Jamaica the real interest rate has a positive effect on financial saving but a negative effect on investment. Money and capital are substitutes rather than being complementary to one another.

The rate of economic growth in Jamaica is found to be positively related to the rate of growth of exports and the ratio of foreign savings to GDP. Exports and foreign saving reduce the foreign exchange constraint on growth, with the former possibly having the additional benefit of increasing productivity and diversity in the export sector. Public sector saving had the highest (positive) impact on growth, implying that the poor growth performance experienced by Jamaica during the 1970s and 1980s, was strongly influenced by the large government deficits, wasteful expenditure and public sector inefficiency of the period.

The rate of interest is not significant in determining growth, while there is some evidence that McKinnon's (positive) Portfolio Effect of growth on the propensity to save holds for Jamaica. These findings are consistent with the earlier one that the real interest rate is insignificant in determining saving and that saving is demand determined. The inflation surprise factor or uncertainty was found to have had a negative effect on financial saving (with economic agents probably requiring more money for transactions), but seemed to increase private saving, perhaps via the acquisition of real assets in preference to financial assets as hedges against uncertainty.

In general, our empirical findings appear to support the approach of the government to economic policy between 1960 and 1972 when foreign savings and exports were encouraged. Real growth rates were high, and both savings and investment rose rapidly.

Between 1973 and 1980 a new government adopted inward looking policies: import substitution, national ownership and self-reliance. Foreign saving declined markedly, government saving rates fell drastically and export performance became erratic. As a result real

growth rates were zero or negative throughout the decade, and saving and investment fell sharply. These results are consistent with our findings that the real growth rate is strongly and positively influenced by government saving, exports and capital inflows.

Given our empirical results, attempts under various IMF supported programs during the 1980's to stimulate growth by raising the real interest rate, appear to have been ill-conceived. Such attempts contributed to the economic stagnation experienced by Jamaica during that period. The issue of financial liberalisation is still topical in the 1990's. However, policy makers in Jamaica may well be frustrated in their efforts to implement a program of financial liberalisation in the future, if the structural and institutional features of Jamaica's economy are not taken into account.

CHAPTER IV

Inflation, Interest Rates and Growth

4.1 *Introduction*

This chapter examines the role of inflation in financial liberalisation models and its impact on financial variables, the government deficit and economic growth. In addition, the effect on growth of public and private investment and their respective productivities, as well as the issue of the crowding out of private investment by public investment, are considered. These effects are examined in the context of public and private sector responses to inflationary pressures.

Section 4.1.1 examines the relevant theoretical and empirical literature on inflation in financial liberalisation models, focusing on the impact of real interest rates on inflation, inflation on real growth, and the government deficit on growth. Section 4.1.1 deals with the question of public and private sector productivity and the financial crowding out of private by public investment. Section 4.1.2 of this introduction identifies explicitly the various hypotheses to be tested in this chapter, while section 4.2 examines the empirical evidence for Jamaica. The first part of section 4.2 (i.e. 4.2.1) examines the link between inflation and the real interest rate, and the effect of inflation on financial savings and total credit availability. Section 4.2.2 considers the effect of inflation on the government deficit and private sector credit, while section 4.2.3 analyses the impact of inflation on investment and economic growth. The issues of public and private investment productivity and the effect of the former on the latter are analysed in section 4.2.4. The chapter summary and conclusions are presented in section 4.3.

4.1.1 *Inflation in Financial Liberalisation Models*

In the models of Kapur (1976, 1983) and Mathieson (1979, 1980) reviewed in Chapter (2), financial liberalisation lowers inflation by raising the demand for money relative to the money supply. Inflation is determined by the difference in the growth rates of money supply and money demand, with excess money supply growth being inflationary. High interest rates raise the demand for money (broadly defined) and dampen inflation.

The financial liberalisation models identify monetary expansion (or excess money supply) as the main cause of inflation. In contrast, structuralist/post-Keynesian inflation theory views the money supply as a propagator of inflation rather than its prime cause. Inflation is generated by changes in relative prices and cost-push factors engendered by institutional rigidities in the agricultural, government, foreign and financial sectors. Those rigidities are themselves manifestations of distributional conflicts between the public and private sectors and the struggle for income shares between unions, firms and other classes (Taylor, 1983, 1991, 1992). Such conflicts result in demands for higher money wages, rising producer margins, larger budget deficits and exchange rate depreciation. It is the resulting changes in production costs and relative prices that induce changes in the level of aggregate demand and the general price level,[1] via the money supply which necessarily adapts to the demands placed upon it (see Rousseas 1986, Palley 1991 and Howells 1995). In general, the observed positive relationship between the money supply and inflation found for many countries, does not mean that excess money causes inflation. Money is simply a mechanism through which other factors work.

One's view of the causes of inflation matters because of the implications for economic policy. In effect, the structuralist/post-Keynesian approach sees the fundamental cause of inflation as the pressure of economic growth on an immature institutional/economic structure. Therefore, restrictive monetary and fiscal policies will have no lasting effect on inflation without structural change to facilitate smooth economic growth.

Fry's (1995) model of inflation is typical of the financial liberalisation models (eg those of Kapur[2] and Mathieson[3]), in that inflation is determined as the difference between the growth rates of money supply and money demand. Money market equilibrium is expressed as:

$$\mathbf{M^s = M^d} \qquad \textbf{(4.1)}$$

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[1] Relative price changes (ie imbalances in sub-markets) may cause general inflation because the inflationary effects of excess demand may exceed the deflationary effects of an equivalent amount of excess supply (Thirlwall, 1974). Prices in markets with excess supply may be affected by non-linearities in a downward direction, while overall inflation is determined by price and market conditions in the most buoyant economic sectors. (Rajapakse, 1994). Given aggregate demand, general inflation will be higher, the greater the dispersion of demand among markets (Thirlwall, 1969).

[2] Op. cit.

[3] Op. cit.

or

$$M^s = P.N._m{}^d \qquad (4.2)$$

where M^s is the nominal money supply broadly defined, M^d is nominal money demand, P is the price level, N is the population and m^d is the per capita real money demand $(M^d/p)/N$. Expressing equation (4.2) in first difference logarithmic form gives:

$$\Delta \log(M^s) = \Delta \log(P) + \Delta \log(N) + \Delta \log(m_d) \qquad (4.3)$$

which upon re-arranging gives:

$$\pi = \Delta \log (M^s/N) - \Delta \log (m^d) \qquad (4.4)$$

where π is the rate of inflation.

Fry argues that the prevalence of auction markets in developing countries ensures the money market clears and that the equilibrium condition holds in the short run[4]. Fry[5] contends that inflation can be explained by the rate of change of nominal money supply and the determinants of the rate of change of real money demand, providing the money market clears within the time period under consideration. In addition, he argues that changes in the money supply can be treated as exogenous provided that any feedback from inflation to money supply growth occurs with a lag. This allows him to treat equation (4.4) as a causal relationship, with the inflation rate (π) being the dependent variable. In practice, the inefficiency of markets including auction markets in developing countries gives no guarantee that the money market will clear in the short run. Also, as argued by the structuralists/post-Keynesians (see above), the money supply may not be exogenous.

The demand for real money is specified as a function of a price variable and a budget constraint. The former is represented by the real interest rate $(d-\pi^e)$[6] and the latter by per capita or expected real income (y_p). Fry specifies the long-run or desired money demand function as:

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[4] i.e. for models based on annual data.

[5] Op. Cit.

[6] where d is the nominal deposit interest rate and π^e is the expected rate of inflation.

$$m^* = cy_p^b \; e^{a(d - \pi^e)} \qquad (4.5)$$

where m^* is the desired level of real money balances and a, b, and c are constants. The short-run or actual money demand function allows for a lagged adjustment to the determinants of desired money holdings:

$$\log(m^d) = \log(m_{t-1}) + \theta\left[\log(m^*) - \log(m_{t-1})\right] \qquad (4.6)$$

Equation (4.6) implies that some fraction (θ) of the gap between desired money balances and money balances held in the previous time period is eliminated in the current time period. Combining equations (4.5) and (4.6) and expressing the result in first difference logarithmic form gives:

$$\Delta \log (m^d) = b\,\Delta \log (y_p) + \theta a(d - \pi^e) + (1-\theta)\,\Delta \log (m_{t-1}) \qquad (4.7)$$

Letting γ^e represent the growth rate of per capita[7] permanent income D log (yp), and substituting equation (4.7) into equation (4.4) gives:

$$\pi = \Delta \log(M^s / N) - \theta b \gamma^e - \theta a \Delta(d - \pi^e) - (1-\theta)\,\Delta \log(m_{t-1}) \qquad (4.8)$$

Equation (4.8) incorporates a stock adjustment lag for real money balances, Δ log (M^s/N). In addition, it includes similar sources of dynamic adjustment embodied in the Kapur[8] and Mathieson[8] models, ie adaptive expectations of inflation and permanent income growth, and an expectations-augmented Phillips curve.[9] Adaptive expectations of inflation and per capita income growth are, respectively:

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[7] Expected income growth is expressed in per capita terms. However, aggregate domestic or national income can be used.

[8] Op. Cit.

[9] It should be noted however, that Kapur's dynamic mechanism is partially based on money market disequilibrium (at least initially), while Mathieson's assumes immediate and sustained money market equilibrium

$$\pi^{e} = \sum_{i=0}^{m} \alpha_i \pi_{(t-1)} \qquad (4.9)$$

and

$$\gamma^{e} = \sum_{j=0}^{n} \beta_j \gamma^{pc}_{(t-j)} \qquad (4.10)$$

where γ^{pc} is actual per capita income growth and γ^{e} is expected (or permanent) per capita income growth. The lag coefficients α_i and β_j are constrained to add to 1 and to decline monotonically (or to exhibit an inverted U pattern).

Equation (4.8) may be simplified as follows:

$$INF = a_{10} + a_{11}MNG + a_{12}YNGE + a_{13}DRD \quad . \qquad (4.11)$$

where INF is the rate of inflation, MNG is the growth rate of the per capita money stock, YNGE is expected growth in per capita income, and DRD is the change in the real deposit interest rate. Equation (4.11) is derived from the equilibrium condition in the money market: demand equals supply [equations (4.1) and (4.2)].

The financial liberalisation theorists would argue that monetary expansion (MNG in equation (4.11)) raises the inflation rate which in turn leads to a rise in expected inflation via the adaptive expectations equation (4.9). Higher expected inflation lowers the real interest rate and therefore lowers (DRD) in equation (4.11) if the nominal deposit rate is fixed. A lower real deposit interest rate lowers money demand which in turn implies higher excess money supply and higher inflation. Money supply growth (MNG) is positively related to inflation, while real interest rate changes (DRD) and inflation are negatively related. Faster money supply growth is inflationary, while higher real interest rates can be expected to dampen inflation. Post-Keynesians would concede that a positive relationship may exist between inflation and the money supply, but as argued above, would question the direction of causation. Also, higher interest rates might be inflationary rather than deflationary, given that the interest rate affects the cost of finance that might be used for investment.

Fry[10] goes on to argue that higher real interest rates increase the availability of credit for investment and generate higher economic growth. This argument neglects the possibility that greater financial savings engendered by higher interest rates might come at the expense of non-financial savings. As Chapter 3 has shown, high real interest rates do not in themselves lead to higher overall savings or higher economic growth in Jamaica. Fry[10] expects a positive relationship between the real rate of interest (RD) and short-run growth (YG) in his growth equation:

$$YG = a_{20} + a_{21}YGNA + a_{22}(\pi - \pi^e) + a_{23}RD \qquad (4.12)$$

where (π - π^e) is the difference between actual and expected inflation, and (YGNA) is long-run growth (to which short-run growth is positively related).

The relationship between inflation and growth is more complex. Fry[11] argues that there are two opposing processes at work. On the one hand, if actual inflation exceeds expected inflation, entrepreneurs interpret the difference to mean that real demand for their products has risen. They then respond by raising capacity utilisation in the short run and increasing investment to raise capacity in the long run. The higher is (π - π^e), the better the investment outlook and the higher the rate of economic growth.

On the other hand, expected inflation affects growth through the real deposit rate of interest (d-π^e). As domestic credit is the primary asset backing the monetary liabilities of the banking system, the demand for real money determines to a large extent the supply of real credit. Inflation in previous periods causes expected inflation to rise, the real interest rate to fall, and financial savings to decline. As a result real domestic credit declines, squeezing both working and fixed capital and ultimately lowering the growth rate of output. In addition, inflation widens the gap between the government's revenue and expenditure, and the ensuing growth in the fiscal deficit is typically financed by greater reliance on seignorage or the inflation tax. Seignorage is extracted as the government increases its proportion of credit from the banking system at the expense of the private sector. In effect, inflation has a double adverse effect on growth: firstly by

[10] Op. Cit.

[11] Op. Cit.

reducing the overall availability of credit and secondly by the effect of higher public sector borrowing on the private sector. The inflation tax rises as more money than the public wishes to hold is created[12].

The overall effect of inflation on growth depends on the relative strengths of the two effects described above: the reaction of entrepreneurs to the gap between inflation and expected inflation ($\pi - \pi^e$) and the effects of expected inflation on the real interest rate ($d - \pi^e$), credit availability and crowding out of private bank borrowing by government borrowing. Considering equations (4.11) and (4.12) together, Fry argues that monetary expansion (MNG) leads to a rise in inflation (equation 4.11), which is in turn associated with a higher rate of economic growth [$\pi - \pi^e$ and YG in equation (4.12)]. The relationship between ($\pi - \pi^e$) and (YG) is the short-run expectations augmented Phillips curve trade-off. In the long-run where $\pi^e = \pi$, inflation has a negative effect on growth via the real deposit interest rate ($d - \pi^e$), if (d) is held constant and below its equilibrium level. The contention is that in a financially repressed economy the long-run Phillips curve produces a negative relationship between inflation and growth.

The empirical evidence on the relationship between inflation and growth is mixed. Van Wijnbergen's (1982) time series study of Korea between 1966 and 1979 shows an initial negative relationship between inflation and growth. In a study using panel data for twenty-seven developing countries across latin America, Africa, Asia and the Pacific Basin (plus Greece and Portugal), Fry (1995) finds a significant negative relationship between inflation and growth for the period 1960-1988. Langoni and Kogut (1977) also find a negative relationship for Brazil for the years between 1962 and 1975.

On the other hand, Langoni and Kogul[13] find a positive relationship between growth and inflation for Brazil, over the period 1957-1961. In two studies on Turkey, Fry (1980 and 1995) also finds a positive and significant relationship between inflation and growth for the periods 1950-1977 and 1951-1985 respectively. The work of Thirlwall and Barton (1971) and Thirlwall (1974) on various countries, seems to suggest that low rates of inflation might be positively related to growth, while high rates (perhaps in excess of ten per cent) [14]might be negatively related to growth. Sarel (1996), Bruno and Easterly (1995), and Stanners (1993) also find that inflation and growth may be related in a non-linear manner. High

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[12] The contention explicit or implicit in the work of Fry, Kapur and Mathieson (Op. Cit) that inflation affects government income and the public sector deficit, and that the latter has a direct impact on credit, growth and presumably the money supply is curious. The argument is remarkably close to the structuralist/post-Keynesian view of the inflation process and money creation reviewed earlier.

[13] Op. Cit.

[14] See Ghatak (1981).

inflation might discourage voluntary savings and have an adverse effect on the structure of investment favourable to growth. Also, if the structuralist view of the world is valid, it is the underlying structural characteristics of economies that give rise to both inflation and growth. Inflation itself does not "cause" or "retard" growth, so that both a positive and negative relationship between the two might be observed for the same economy at different times, depending on what is happening to fundamental economic and social structures. Inflation might well be a necessary by-product of the growth process.

Returning to the argument that inflation-induced government deficits might crowd out private bank borrowing and retard growth, financial liberalisation models implicitly assume that government loans from the banking system are consumed rather than invested, or that public sector investment is less productive than private sector investment. If the productivity of the former is greater than that of the latter, then a rise in the proportion of bank credit to the public sector at the expense of the private sector might stimulate growth. Khan and Reinhart's (1990) approach to analysing the productivity of public and private sector investment is examined in the next sub-section.

4.1.1.1 The Productivity of Public and Private Sector Investment

Productivity in the context of aggregate investment refers to the effectiveness with which investment leads to increases in output (marginal productivity of capital), or the output generated by one unit of capital (average productivity). Productivity is the relationship between inputs (e.g of capital) and output (e.g GDP or aggregate income), and is related to the broader and more complex concept of efficiency which refers to the best utilisation of resources in the production process.

This sub-section develops the framework within which the productivity of public and private investment in relation to output growth, will be measured for Jamaica later on in this chapter. Interpreting the relationship between public and private investment on the one hand and growth on the other, has to be done with care because of the possible influence of public investment on private investment. This effect must be taken into account in measuring and evaluating the productivity of private investment relative to that of public investment.

The World Bank and International Monetary Fund have generally taken it for granted that public investment is constrained by bureaucracy and political considerations and is therefore less productive than private investment (see for example, World Bank, 1989). Both institutions consistently encourage their

member countries to privatise public enterprises in order to stimulate growth. There are, however, few studies on the productivity of public and private investment and their effect on growth. Khan and Reinhart (1990) develop a model to measure the productivity of public and private investment for twenty-four developing countries for the period 1970-1979. the model utilises an aggregate production function in which output (y) is a function of the capital stock (k), the labour force (L) and other variables (Z), with (A) representing total factor productivity:

$$y = A\gamma(K, L, Z) \tag{4.13}$$

Equation (4.13) can be written in growth form as:

$$\frac{\delta y}{y} = \left(A.\frac{\delta y}{\delta k}\right)\frac{\delta k}{y} + \left(A.\frac{\delta y}{\delta L}.\frac{L}{y}\right)\frac{\delta L}{L} + \left(A.\frac{\delta y}{\delta Z}.\frac{Z}{y}\right)\frac{\delta Z}{Z} + \frac{\delta A}{A} \tag{4.14}$$

or alternatively:

$$\frac{\Delta y}{y(t-1)} = \alpha_0 + \alpha_1 \frac{I}{y(t-1)} + \alpha_2 \frac{\Delta L}{L(t-1)} + \alpha_3 \frac{\Delta Z}{Z(t-1)} \tag{4.15}$$

where $\alpha_0 = A.\frac{\delta A}{A}$, $\alpha_1 = A.\frac{\delta y}{\delta K}$, $\alpha_2 = A.\frac{\delta y}{\delta L}.\frac{L}{y}$,

$\alpha_3 = A.\frac{\delta y}{\delta Z}.\frac{Z}{y}$, $I = \delta K$ **(4.16)**

The term (α_1) is the marginal productivity of capital (which is assumed to be constant across the countries in the study), (α_2) is the elasticity of output with respect to labour, (α_3) is the elasticity of output with respect to the "Other" variables, and (α_0) represents the growth in total factor productivity. The actual incremental output-capital ratio (IOCR) is α_1 if $\alpha_0 = \alpha_2 = \alpha_3 = 0$, or alternatively the incremental capital-output ratio (ICOR) is $\frac{1}{\alpha_1}$. If $\alpha_0 \neq 0$, $\alpha_2 \neq 0$, and $\alpha_3 \neq 0$, then $\frac{1}{\alpha_1}$ would be the net (ICOR), which is an estimate of the (partial) productivity of investment with the variables (L) and (Z) being held constant.

Khan and Reinhart then divide aggregate investment into its public (Ipbl) and private (Iprv) components:

$$\frac{\Delta y}{y_{(t-1)}} = \beta_0 + \beta_1 \frac{Ipbl}{y_{(t-1)}} + \beta_2 \frac{Iprv}{y_{(t-1)}} + \beta_3 \frac{\Delta L}{L_{(t-1)}} + \beta_4 \frac{\Delta Z}{Z_{(t-1)}} \qquad \textbf{(4.17)}$$

If $\beta_2 > \beta_1$ then the marginal productivity of private investment exceeds that of public investment, and vice versa if $\beta_1 > \beta_2$. Two versions of equation (4.17) are tested. One replaces the "other" variable term $\left(\beta_4 \frac{\Delta Z}{Z_{(t-1)}}\right)$ with the growth rate of exports $\left(\beta_4 \frac{\Delta X}{X_{(t-1)}}\right)$, while the other replaces it with the growth rate of imports $\left(\beta_4 \frac{\Delta M}{M_{(t-1)}}\right)$.

The estimated marginal productivity of private investment is positive and more significant in both versions of equation (4.17) (i.e. 0.158 and 0.209) than the estimated marginal productivity of public investment which turns out to be negative and statistically insignificant (-0.108 and -0.182). Khan and Reinhart[15] conclude that the productivity of public investment is insignificant and that public sector investment has no significant direct effect on real growth. Sarmad (1990)[16] confirms the findings of Khan and Reinhart for a subset of fifteen developing countries for the same period (1970-79). However, when the model is tested for the twenty-four countries for the 1980-87 period, the productivity of public investment is found to be positive, statistically significant and higher than that of private investment (which is also positive and significant). Sarmad argues that the role of public investment in growth is at least as important as that of private investment, but that capital projects in earlier years (e.g. the 1970-79 period) had longer gestation periods and were often more unproductive than later projects.

Khan and Reinhart[17] caution against interpreting their results too literally, as their model does not allow for any indirect effects (whether positive or negative) of public investment on private investment. Public and private investment are complementary if increases in the former stimulate the latter. On the other hand there may be a substitution effect if an increase in public investment crowds out or reduces private investment. Both effects might occur at the same time, making the net effect difficult to predict.

Public and private investment might complement one another because of the positive impact that public infrastructural projects might have on the profitability and efficiency of private investment. In

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[15] Op. Cit.
[16] Reported in Warman (1993)
[17] Op. Cit.

addition, in the absence of full employment, public investment may increase aggregate demand and increase the size of the market for private sector output, thereby stimulating private investment. On the other hand, if public output competes with private output then the latter may be crowded out, particularly at full employment. In addition to physical crowding out, financial crowding out might also occur if government borrowing from the financial system reduces the availability of credit to the private sector.

A recursive model developed by U. Tun Wai and Wong (1982) measures the net effect of public on private investment. Private investment (Ip_t) is determined in their model by public investment (Ig_t), the change in credit to the private sector (Fp_t), and the stock of private sector capital lagged by one period (Kp_{t-1}):

$$\mathbf{Ip_t = c_0 + c_1 IG_t + c_2 FP_t + c_3 KP_{(t-1)}} \qquad \textbf{(4.18)}$$

The coefficient (c_1) represents the complementary effect of public investment on private investment[18]. Credit to the private sector is defined as total credit[19] (F_t) minus credit to the public sector (Fg_t):

$$\mathbf{Fp_t = F_t - Fg_t} \qquad \textbf{(4.19)}$$

Public sector credit is in turn determined by public investment Ig_t:

$$\mathbf{FG = g_0 + g_1 Ig_t} \qquad \textbf{(4.20)}$$

Substituting equation (4.20) into (4.19) and then (4.19) into (4.18) gives

$$\mathbf{Ip_t = k_0 + k_1 Ig_t + k_2 F_t + k_3 KP_{(t-1)}} \qquad \textbf{(4.21)}$$

where the public investment coefficient $k_1 = c_1 - c_2 g_1$ represents the financial crowding out effect (or lack thereof).

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[18] Note however, that it is somewhat misleading to call this the "complementary effect" as it may be negative (i.e. private investment might be substituted by public investment. It might be better to refer to it as the "direct effect". Similarly, the crowding-out effect might best be described as the "indirect financial effect".

[19] Domestic credit plus net foreign capital inflows.

The empirical evidence on crowding out is mixed and there is no set pattern. Nor can a reliable conclusion on the existence or otherwise of crowding out be made on a-priori or theoretical grounds. As Galbis (1979a) has pointed out, it all depends on the institutional structures of particular economies. The Tun Wai and Wong (1982) model is used in section 4.2 to measure the net effect of public investment on private investment.

4.1.2 Identification of the Financial Liberalisation Hypotheses on Inflation, Interest Rates, Growth and Investment for Empirical Testing.

This sub-section identifies the various hypotheses, explicit and implicit, to be tested in the next section. Several issues are examined:

(1) Fry's[20] hypothesis that higher real interest rates lower the rate of inflation.

(2) The contention of the financial liberalisation "school" that inflation lowers the amount of credit available for investment by reducing the amount of financial savings in the banking system.

(3) The hypothesis that inflation leads to a re-distribution of bank credit from the private to the public sector. The argument is that inflation increases the budget deficit and leads to an increase in government borrowing from the banking system at the expense of private sector borrowing.

(4) Fry's[21] argument that the difference between actual and expected inflation may have a positive effect on investment by acting as a signal that demand conditions have improved. Higher inflation stimulates investment and may generate higher economic growth.

(5) The assumption implicit in the various financial liberalisation models that the productivity of private investment is higher than that of public investment.

(6) The hypothesis that private sector investment is physically crowded out by public sector investment,as well as financially crowded out of the credit market by public borrowing, which causes private investment to decline even further.

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[20] Op. Cit.
[21] Op. Cit.

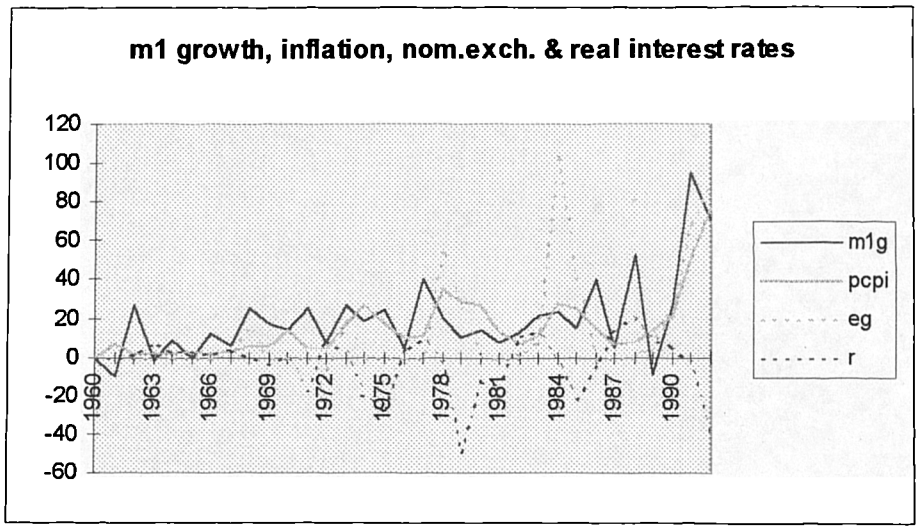
The next section examines the empirical evidence for Jamaica.

4.2 *JAMAICA: THE EMPIRICAL EVIDENCE*

4.2.1 *Real Interest Rates, Inflation, Financial Savings and Total Credit*

The First issue to be examined is Fry's contention that higher real interest rates lead to lower inflation[22]. Chart (4.1) shows the rate of inflation (pcpi), the growth rate of the nominal money supply (mlg), the rate of change of the nominal exchange rate (eg) and the real interest rate (r).

Chart 4.1



Source: IMF Electronic Databank

International Fin. Stats.(IMF), 1960-1992

World Tables (World Bank), various years over period 1960 1992

The average rate of inflation between 1960 and 1990 was 12.44 per cent. Inflation during the years of high economic growth (see Chapter 2) was an average 4.65 per cent per annum, while it rose to an annual average of 21.8 per cent and 15.07 per cent during the crises years (1973-1980) and the period

[22] It should be noted that high inflation may itself lower the real interest rate before the nominal interest rate has adjusted.

of intermittent recovery (1981-1990) respectively. The real interest rate fell from 7.57 per cent in 1963[23] to 5.6 per cent in 1990. It was mainly positive up to 1972, and thereafter fluctuated widely between positive 2.85 per cent in 1973 and negative 49.77 per cent in 1979 in response to the monetary and fiscal policies of the government (see Chapter 1). Neither a positive nor negative relationship between inflation and the real interest rate is obvious from a visual inspection of chart (4.1).

Fry's (1995) money equilibrium model of inflation, equation (4.11) may be specified as follows:

$$\mathbf{pcpi = a_0 + a_1 m1g + a_2 gdpeg + a_3 dr + a_4 eg} \qquad \textbf{(4.22)}$$

where pcpi is the inflation rate as represented by continuously compounded changes in the consumer price index, m1g is the growth in the nominal money supply, gdpeg is growth in expected gdp, dr is the change in the real deposit interest rate, and eg is the percentage change in the nominal bilateral exchange rate (where e represents Jamaica dollars per US dollar).

Equation (4.22) is similar to equation (4.11) except for the additional explanatory variable (eg), and except that (4.11) is expressed in per capita terms[24]. Also, the narrow definition of the money supply[25] is used in preference to broader definitions which were statistically insignificant in the equation. It seems that the link between money as the medium of exchange and inflation is more significant than the role that broader measures of money as an asset play in influencing inflation in Jamaica. Expected gross domestic product is obtained by adjusting actual GDP in the previous period by its change over the period before. ($GDP^e = GDP_{t-1} + (GDP_{t-1} - GDP_{t-2})$. Expectations in this simple adaptive model are based on the previous year's GDP and the changes in previous year's GDP. The real deposit interest rate used to calculate (dr), takes account of inflation. The World Bank's (1989)[26] formula is used:

$$r = \left[\frac{1+id}{1+\dot{p}}\right] - 1 \qquad \textbf{(4.23)}$$

where id is the nominal deposit interest rate, $\dot{p}$ is the rate of inflation, and r is the real interest rate.

---

[23] Reliable data are unavailable for the period 1960-62.

[24] Equation (4.22) gave better statistical results than its per capita equivalent

[25] Currency in the hands of the public plus demand deposits.

[26] World Development Report (1989).

Equations *: Inflation* ***(PCPI)****, Financial Savings* ***(FSR)*** *& Tot. Credit Availability* ***(TCREDR)***

	{1} - PCPI			{2} - PCPI			{3} - FSR			{4} - TCREDR		
Vbls.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.
CONST.	-0.27	-0.11	0.915	-0.14	-0.05	0.960	-10.3	-1.99	0.060	-22.3	-1.50	0.148
FSR										1.67	2.59	0.017
GDPR							0.11	2.52	0.019	0.40	2.73	0.012
R				-0.03	-0.19	0.85	0.78	2.94	0.008			
INFDIFF							-0.03	-0.57	0.573			
GDEFR										2.36	6.62	0.000
RDIFF							0.73	3.07	0.006			
$PCPI_{(t-1)}$	0.60	4.44	0.000	0.58	3.09	0.005						
GDPRLA												
DR	-0.03	-0.39	0.703									
M1G	0.16	2.34	0.029	0.16	2.26	0.033						
GDPEG	0.06	0.41	0.689	0.07	0.14	0.519						
EG	0.25	4.19	0.000	0.26	4.58	0.000						
ERG												
R-sqrd		0.87			0.87			0.40			0.81	
R bar-sqd		0.84			0.85			0.30			0.78	
D.W.					1.96			1.82			1.79	
Durbin-h		-0.17	0.87		none							
F	(5,23)	30.55	0.00	(5,24)	32.73	0.00	(4,22)	3.66	0.02	(3,22)	30.5	0.00
S.E.		6.521			6.407			3.11			11.1	
n		29			30			27			26	
ser.corr	chi-sq	[1]	0.15	chi-sq	[1]	0.01	chi-sq	[1]	0.21	chi-sq	[1]	0.14
func.form	chi-sq	[1]	3.44	chi-sq	[1]	3.65	chi-sq	[1]	2.20	chi-sq	[1]	1.11
normality	chi-sq	[2]	0.97	chi-sq	[2]	0.75	chi-sq	[2]	0.32	chi-sq	[2]	4.86
heterosc.	chi-sq	[1]	1.96	chi-sq	[1]	2.66	chi-sq	[1]	0.80	chi-sq	[1]	3.64
chow	chi-sq	[4]	7.17	chi-sq	[4]	8.23	chi-sq	[4]	1.61	chi-sq	[4]	2.25

The regression on equation (4.22) uses Ordinary Least Squares and the results are as follows:

$$\underset{\quad}{\mathbf{pcpi = -0.27 + 0.60pcpi_{(t-1)} + 0.16m1g + 0.06gdpeg - 0.03dr + 0.25eg}}$$
$$\mathbf{(-0.11)\ (4.44)\qquad (2.34)\qquad (0.41)\qquad (-0.39)\quad (4.19)\qquad\qquad (4.24)}$$

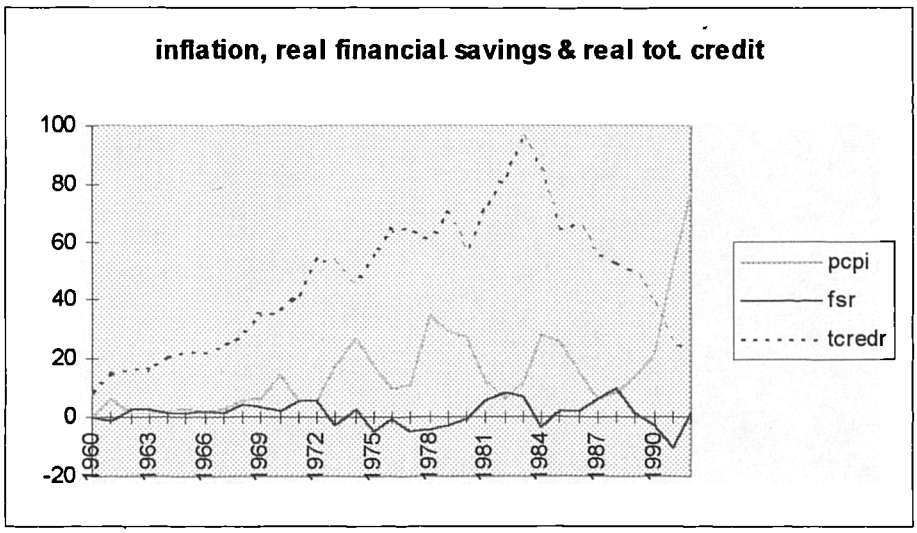
where the t- values are below the coefficients. The equation satisfies the diagnostic tests for auto-correlation, functional form, normality, heteroscedasticity and Chow's test of the stability of the parameters, and the results are summarised as equation {1} of Table (4.1). The equation is well determined. The results indicate that changes in the real interest rate (dr) are not significant in the determination of inflation in Jamaica. The regression was re-run using the real interest rate (r) instead of (dr), with similar results (see equation {2} of Table (4.1)). The hypothesis that higher real interest rates reduce inflation is not supported in the case of Jamaica.

In addition, about 40 per cent of the adjustment to long run inflation takes place in one year, ceteris paribus. This would seem to indicate that the information systems that signal price movements to economic agents are somewhat slow to take effect or are not accurately perceived. The other main variables positively associated with inflation (as expected), are changes in the exchange rate of the Jamaica dollar (eg) and money supply growth (m1g). Depreciation of the Jamaica dollar by ten per cent generates inflation of two and a half per cent, while a ten per cent increase in the money supply is associated with an increase in inflation of 1.6 per cent, ceteris paribus.

The second issue to be examined is the contention of the financial liberalisation "school" that inflation lowers the total amount of credit available for investment. According to this view, the difference between inflation and expected inflation has a negative effect on financial savings by lowering the real deposit rate of interest. Reduced financial savings give rise to a smaller amount of total bank credit.

Chart (4.2) indicates that in general, inflation (pcpi) moved in a direction opposite to that of real financial savings (fsr) and real bank credit (tcredr) throughout the 1960-92 period, except for the years 1962-1967 when inflation and financial savings were very low and bank credit grew steadily.

Chart 4.2



Source: IMF Electronic Databank

International Fin. Stats.(IMF), 1960-1992

World Tables (World Bank), various years over period 1960 1992

Equations {3} and {4} of Table (4.1) are used to test the effect of inflation on the total credit of the banking system. The effect of inflation on financial savings is first tested using equation {3}, followed by equation {4} which examines the link between financial savings and credit.

Real financial savings[27] (FSR) are regressed on the real deposit interest rate[28] (r), real GDP (GDPR), the interest rate differential (rdiff) [29] and the difference between actual inflation and expected inflation (INFDIFF). As in Chapter 3, the real interest rate, the interest rate differential and real GDP (GDPR) are expected to have a positive impact on real financial savings. If the financial liberalisation contention is correct, inflation is expected to have a negative effect on financial savings. The results are as follows:

$$\mathbf{FSR = -10.30 + 0.11\ GDPR + 0.78\ r + 0.73\ rdiff - 0.03\ INFDIFF} \qquad (4.25)$$

$$\mathbf{(-1.99)\quad (2.52)\qquad (2.94)\quad (3.07)\quad (-0.57)}$$

[27] As defined in Chapter 3

[28] Previously defined in this chapter and in Chapter 3.

[29] As defined in Chapter 3

where the t-statistics are in brackets beneath the coefficients. The equation is well determined and passes the various diagnostic tests performed upon it, including Chow's test of parameter stability (see Table 4.1).

Holding the influence of other variables constant, inflation relative to expected inflation seems to have had a negative but insignificant impact on real financial savings over the period. It seems that increases in the inflation differential per se do not discourage financial saving in Jamaica, though inflation volatility or surprise does have a negative effect on financial savings (see Chapter 3). Equation 4.25 was re-run using inflation instead of the inflation differential, with similar results, though the diagnostics were weaker than those for the above equation when the differential was used. As expected, the real deposit interest rate (r), the interest rate differential (rdiff) and real GDP (GDPR) are significant positive determinants of financial savings. This re-enforces similar results obtained in chapter three.

Equation {4} of Table (4.1) measures the effect of financial savings on total real credit (tcredr). In addition, the influences of real GDP (GDPR) and the real government deficit (GDEFR) on total credit are examined. All three are expected to be positive (the effect of the government deficit will be examined in greater detail later on in this section). The results are as follows:

$$\mathbf{TCREDR = -22.3 + 1.67FSR + 0.40GDPR + 2.36GDEFR}$$
$$\mathbf{(-1.50)\ \ (2.59)\qquad (2.73)\qquad (6.62)} \qquad\qquad \mathbf{(4.26)}$$

All the variables are positive and significant[30]. In particular, higher financial savings give rise to more credit. However, given the insignificant effect of inflation on financial ssavings in equation (4.25), the financial liberalisation hypothesis that inflation relative to expected inflation reduces total credit availability, is not borne out for Jamaica.

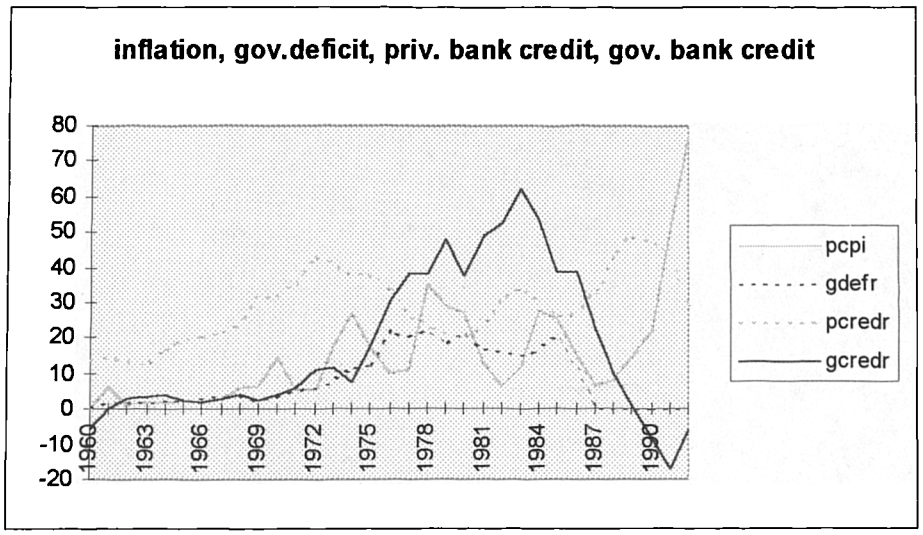
4.2.2 The Government Deficit and Private Sector Credit.

The third hypothesis to be examined is that inflation widens the budget deficit and leads to higher government borrowing from the banking system at the expense of private sector borrowing. Government

[30] The biggest positive influence on total credit is the government deficit. The higher the deficit, the larger is the total amount of bank credit in the economy. The role of the government has important implications for private sector borrowing and for economic growth, as will be seen later in this chapter.

expenditure outpaces revenue when there is high inflation, and governments often finance growing deficits by printing money or by borrowing from the banking system. Here we examine whether bank credit to Jamaica's private sector is reduced in the process.

Chart 4.3



Sources: IMF Electronic Databank, Manchester Univ.
International Fin. Stats.(IMF), 1960-1992

Chart (4.3) gives a visual impression of the movement of inflation (PCPI), the government deficit (GDEFR) and credit to the government (GCREDR), which seems to move in roughly the same direction. Credit to the private sector (PCREDR) moves in the opposite direction, particularly during the crisis years (1973-1980), and the period of intermittent recovery (1981-1990).

Table (4.2) summarises the equations used to test the third hypothesis described above, and presents the respective regression results. In equation {5} of the table, inflation (PCPI) and the lagged change in real GDP (GDPRLA) are used as explanatory variables for the real government deficit

Equations**: Gov't Deficit **(GDEFR)**, Bank Credit to Gov't **(GCREDR)**, Bank Credit to Gov't/Tot. Credit **(GCREDRT)**, Bank Cred. to Priv.Sector **(PCREDR)**, Bank Cred. to Priv.Sector/Tot. Credit **(PCREDRT)

	{5} - GDEFR			{6} - GCREDR			{7} - GCREDRT			{8} - PCREDR			{9} - PCREDRT		
Vbls.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.
CONST.	5.46	2.95	0.008	-6.35	-1.62	0.119	0.02	0.55	0.586	-14.1	-3.82	0.001	0.32	2.39	0.026
FSR	0.25	0.86	0.4	1.38	2.31	0.030	0.01	1.60	0.123	0.46	3.85	0.001	0.00	-0.37	0.715
GDPR										0.26	4.57	0.000	0.003	2.71	0.013
GDEFR				2.53	8.79	0.000	0.03	10.26	0.000	-0.25	-4.00	0.001	-0.02	-5.57	0.000
PCPI	0.46	4.48	0.000												
GDPRLA	-0.72	-3.79	0.001												
$PCREDR_{(t-1)}$										0.54	5.12	0.000			
$PCREDRT_{(t-1)}$													0.37	4.57	0.000
R-sqrd		0.71			0.77			0.82			0.96			0.92	
R bar-sqd		0.67			0.75			0.81			0.95			0.91	
D.W.		1.56			1.77			1.49							
Durbin-h											-0.69			0.06	
F	(3,21)	17.13	0.00	(2,23)	38.73	0.00	(2,23)	54.14	0.00	(4,21)	117.7	0.00	(4,21)	64.37	0.00
S.E.		4.314			10.29			0.11			1.94			0.07	
n		25			26			26			26			26	
ser.corr	chi-sq	[1]	0.88	chi-sq	[1]	0.18	chi-sq	[1]	1.09	chi-sq	[1]	0.96	chi-sq	[1]	0.33
func.form	chi-sq	[1]	0.86	chi-sq	[1]	0.87	chi-sq	[1]	0.74	chi-sq	[1]	0.71	chi-sq	[1]	2.21
normality	chi-sq	[2]	4.01	chi-sq	[2]	0.95	chi-sq	[2]	0.26	chi-sq	[2]	2.12	chi-sq	[2]	1.00
heterosc.	chi-sq	[1]	0.03	chi-sq	[1]	3.77	chi-sq	[1]	1.20	chi-sq	[1]	1.31	chi-sq	[1]	0.04
chow	chi-sq	[4]	2.62	chi-sq	[4]	23.84	chi-sq	[4]	8.76	chi-sq	[4]	3.18	chi-sq	[4]	6.57

(GDEFR)[31]. The GDP variable is expected to be negatively related to the government deficit, since increases in real GDP can be expected to increase tax revenue and lower the deficit. The results are as follows:

$$\mathbf{GDEFR = 6.34 + 0.42PCPI - 0.69GDPRLA}$$
$$\mathbf{(4.13)\quad (4.65)\qquad (-3.72)} \qquad \mathbf{(4.26)}$$

Both explanatory variables are statistically significant and have the expected signs. In addition, the equation passes all the diagnostic tests summarised in Table (4.2). The effect of the government deficit on bank credit to the government (GCREDR) is then tested in equation {6} of Table (4.2). The real financial savings variable (FSR) is also used as an additional explanatory variable, since bank credit to the government can be expected to be positively affected by the availability of financial savings. The results are:

$$\mathbf{GCREDR = -6.35 + 1.38FSR + 2.53GDEFR}$$
$$\mathbf{(-1.62)\quad (2.31)\qquad (8.79)} \qquad \mathbf{(4.27)}$$

Once again both explanatory variables are statistically significant and in particular the government deficit has a strong positive impact on government borrowing from the financial system. Considering equations (4.26) and (4.27) together, a 10 per cent rise in inflation is associated with an 11 per cent rise in government borrowing from the financial system.

In addition, the effect of the government deficit on the proportion of credit to the government out of total credit (GCREDRT), is tested in equation {7}, Table (4.2). A ten per cent increase in the government deficit increases the ratio of government to total bank credit by 0.3 per cent. In effect, a 10 per cent rise in inflation (from equation 4.26), increases the share of a credit going to the government by 0.1 per cent. This must imply that the share of credit to the private sector is reduced by an equivalent amount. It does seem that inflation in Jamaica widens the budget deficit and increases bank credit to the government at the expense of the private sector. However, this is tested more directly in equations {8} and {9} of Table (4.2).

---

[31]The revenue and expenditure of the consolidated central government are used to calculate the nominal government deficit, which is then deflated by the consumer price index to obtain the real deficit.

It should be noted that the Chow test of parameter instability indicates that the coefficients in equation {6} of Table (4.2) are unstable. In particular, government borrowing from the financial system in Jamaica does not appear to be a stable function of the government deficit. Other factors such as political considerations and the credit worthiness of the government might well play an important role in the desire of the government to borrow on the one hand, and the desire of the banks to lend on the other. Therefore the magnitudes of the coefficients obtained from equation {5} may not be very reliable, despite the reliability of the underlying long-run relationship (i.e the statistical significance and the positive or negative sign). If we consider equation {7}, Chow's test indicates that the parameters are stable. Therefore we can be reasonably confident in the veracity of our above result that a 10 per cent rise in inflation from equation (4.26), increases the proportion of government credit by about 0.1 per cent considering equation {7}. However, we cannot have the same degree of confidence in our earlier finding that a 10 per cent rise in inflation leads to a rise of 11 per cent in government borrowing in absolute terms (using equation {6} rather than {7}).

We now examine the effect of the government deficit on bank credit to the private sector (PCREDR) more directly in equation {8} of Table 4.2):

$$\mathbf{PCREDR = -14.1 + 0.54PCREDR_{(t-1)} + 0.46FSR + 0.26GDPR - 0.25GDEFR}$$
$$\mathbf{(-3.82)\ \ (5.12)\qquad\qquad (3.85)\qquad (4.57)\qquad (-4.00)\qquad\qquad (4.28)}$$

where (PCREDR) is real bank credit to the private sector, and the other variables are as before. The equation is well determined and satisfies the diagnostic tests, including that of parameter stability. As expected, real financial savings (FSR) and real GDP (GDPR) have a positive and significant effect on private sector credit (PCREDR). In addition, the coefficient on the lagged dependent variable is positive and significant, indicating that some private borrowing finances capital or project-related needs for periods in excess of one year. Also, if the private sector in Jamaica is efficient in its use of financial resources and its ventures are profitable, credit in subsequent periods might well be more forthcoming.

The government deficit (GDEFR) has a statistically significant negative effect on private sector bank credit (PCREDR). A 10 per cent increase in the deficit reduces private sector credit by 2.5 per cent. In addition, equation {9} of Table (4.2) which is well-determined and satisfies all the tests carried out on it, shows that the government deficit reduces the proportion of credit to the private sector (PCREDRT). A 10 per cent rise in the deficit reduces the ratio of private to total credit by 0.2 per cent. Considering

equations (4.26) and {9} in Table (4.2) together, a 10 per cent rise in inflation reduces private sector credit by 0.08 per cent. This is close to our previous conclusion from equations (4.26) and {7} that the same rise in the inflation rate increased the proportion of government credit by 0.1 per cent. The slightly lower figure of 0.08 per cent is perhaps more accurate, given the superiority of equation {9} from the point of view of satisfying the stability tests. In general, the hypothesis that inflation widens the government deficit and crowds out private sector borrowing from the banking system seems to be borne out for Jamaica However, the effect, though statistically significant, is small and care should be taken not to overstate its importance given the limitations of the data for Jamaica (see the Introductory Chapter of this dissertation). The Data Appendix at the end of this chapter shows the amount of bank credit to the private sector and the government over the three decades.

4.2.3 Inflation, Investment and Growth.

The fourth hypothesis to be tested is Fry's (1995) contention that inflation may stimulate investment and economic growth. According to this argument, a rise in the inflation rate relative to expected inflation provides a signal to businesses that demand conditions are improving. Businesses respond by utilising spare capacity and subsequently expanding capacity. Both investment and economic growth are thereby stimulated.

In order to test this hypothesis, we first make use of the investment equation (3.8) used in Chapter 3. The variable (INFDIFF), equal to the difference between actual inflation and expected inflation $(\pi-\pi^e)$[32] is added as an explanatory variable. The results are summarised as equation {10} in Table (4.3) and are as follows:

$$\mathbf{IR = 2.61 + 0.37IR_{(t-1)} - 0.07R - 0.09INFDIFF + 0.52PCREDR + 0.58GDPRLA}$$
$$\mathbf{(0.88)\ (2.50)\qquad (-0.87)\ (-0.86)\qquad (3.30)\qquad (3.10)\qquad (4.29)}$$

where (IR) is real domestic investment, and the other variables are the same as before. The equation satisfies the stability and other criteria and is well-determined (see equation {10}, Table 4.3). The lagged dependent variable ($IR_{(t-1)}$), the lagged accelerator (GDPRLA) and (PCREDR) are all significant and have the expected signs. As can be seen, inflation relative to expected inflation (INFDIFF) has a negative but

[32] The measure of expected inflation is the same as the one used earlier in this chapter.

Equations *: Real Investment* ***(IR)*** *& Real GDP Growth* ***(GDPRG)***

	{10} - IR			{11} - IR			{12} - GDPRG			{13} - GDPRG		
Vbls.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.
CONST.	2.61	0.88	0.389	2.54	0.85	0.405	5.60	5.82	0.000	5.37	5.80	0.000
R	-0.07	-0.87	0.39	-0.15	-2.06	0.050	0.08	1.87	0.077	0.09	1.41	0.175
INFDIFF	-0.09	-0.86	0.396							-0.84	-0.01	0.991
PCREDR	0.52	3.30	0.003	0.54	3.48	0.002						
PCPI				-0.05	-0.71	0.483	-0.06	-0.75	0.461			
GDEFY							-35.0	-3.23	0.004	-40.0	-4.36	0.000
$IR_{(t-1)}$	0.37	2.50	0.020	0.36	2.44	0.023						
GDPRLA	0.58	3.10	0.005	0.56	2.96	0.007						
IRG							0.10	3.79	0.001	0.10	3.79	0.001
R-sqrd		0.85			0.85			0.79			0.78	
R bar-sqd		0.82			0.81			0.74			0.74	
D.W.								1.44			1.39	
Durbin-h		0.33			0.55							
F	(5,24)	26.82	0.00	(5,24)	26.51	0.00	(4,19)	17.60	0.00	(4,19)	17.0	0.00
S.E.		4.478			4.50			2.34			2.37	
n		30			30			24			24	
ser.corr	chi-sq	[1]	0.20	chi-sq	[1]	0.02	chi-sq	[1]	1.95	chi-sq	[1]	2.35
func.form	chi-sq	[1]	0.24	chi-sq	[1]	0.38	chi-sq	[1]	0.30	chi-sq	[1]	0.17
normality	chi-sq	[2]	1.01	chi-sq	[2]	0.69	chi-sq	[2]	0.70	chi-sq	[2]	0.80
heterosc.	chi-sq	[1]	0.33	chi-sq	[1]	0.45	chi-sq	[1]	0.64	chi-sq	[1]	0.01
chow	chi-sq	[4]	2.76	chi-sq	[4]	4.53	chi-sq	[4]	0.73	chi-sq	[4]	1.01

statistically insignificant effect on real investment. The same result is obtained when the variable (INFDIFF) is replaced by inflation (PCPI) in equation {11} of Table 4.3.

Both equations {10} and {11} were tested for the sub-periods 1960-72, when inflation was an average 4.65 per cent per annum, and for the over-lapping sub-period 1970-90[33] when average annual inflation was 16.70 per cent. Inflation turns out to be positively related to investment during the years of low inflation (1960-72), and negatively related to investment during the high inflation period (1970-90). However, these effects are not statistically significant. Nevertheless they are not without interest, given the view that low inflation is a necessary aspect of growth and indeed promotes it, while high inflation (perhaps in excess of 10 per cent) may have a negative effect on investment and growth (see Tun Wai 1959, Dorrance 1966, Thirlwall 1974, Ghatak 1981).

Inflation in Jamaica has been high and volatile over the three decades covered by this study except during the years of high growth (1960-1972), and its overall relationship with investment is found to be negative. However, that relationship is found to be insignificant and Fry's (1995) argument that inflation stimulates investment does not hold for Jamaica over the period.

Equations {10} and {11} also confirm the conclusion of Chapter Three that the real rate of interest has no positive effect on investment, but instead has a significant negative effect. The real rate of interest is an important cost factor for businesses desirous of investing. The higher the cost, the lower the demand for investment. High interest rates may increase financial savings but they do not seem to increase investment in Jamaica. Money and capital do not seem to be complementary.

Equations {12} and {13} examine more directly, the second part of Fry's hypothesis that inflation may stimulate real growth. The results of equation {12} are:

$$\mathbf{GDPRG = 5.60 + 0.08R - 0.06PCPI - 35.0\ GDEFY + 0.10\ IRG}$$
$$\mathbf{(5.82)\quad (1.87)\quad (-0.75)\quad (-3.23)\qquad (3.79)\qquad (4.30)}$$

[33] Inflation between 1960 and 1972 inclusive, was below 6.7 per cent in every year (and 3 per cent or less in 6 of the 12 years considered),except 1970 when the removal of domestic price controls and high inflation in Jamaica's main trading partners resulted in double digit inflation of 14.7 per cent. However, in order to measure the effects of high inflation on investment, our second sub-period starts in 1970, overlapping with the first one which ends in 1972.

where (GDPRG) is real GDP growth, (GDEFY) is the ratio of the government deficit to GDP, (IRG) represents the growth rate of real investment, and the other variables are the same as before. Consistent with the effect of inflation on investment, inflation has a negative but statistically insignificant effect on economic growth in Jamaica. Equation {13} in which inflation relative to expected inflation is used (INFDIFF = $\pi - \pi^e$), gives a similar result. Both equations also confirm our conclusions in Chapter Three that the real rate of interest (R) has no significant effect on real growth, and that the government deficit (GDEFRY) has a negative effect on growth. This finding is important in view of our earlier results in equations {8} and {9} of Table (4.2). If higher government deficits are financed at the expense of the private sector (equations {8} and {9} Table 4.2), yet higher government deficits have a negative effect on economic growth, then the conclusion that public sector investment is less efficient than private sector investment, is inescapable. In addition, it is one thing to find that the public sector crowds out the private sector from the available pool of credit. It is quite another thing to then argue that private sector investment is also reduced, because the private sector may successfully obtain finance from other non-bank sources (eg. own savings, foreign creditors, the primary or secondary stock market, etc). Therefore it is necessary to test whether or not public sector investment itself has any effect on private sector investment.

The next sub-section examines the fifth and sixth hypotheses of the financial liberalisation school listed above, that private sector investment is more productive than public sector investment, and that increases in the latter lead to decreases in the former.

4.2.3.1 The Productivity of Public and Private Investment.

This sub-section examines the productivity of public and private investment using the Khan and Reinhart (1990) model, and the effect of public on private investment using the model of Tun Wai and Wong (1982). Starting with the aggregate production function of Khan and Reinhart[34] and holding labour, total factor productivity and the influence of all other factors constant gives:

$$\mathbf{GDPR = \sigma KR} \qquad \mathbf{(4.31)}$$

[34] Op. Cit.

where (σ) is the productivity of capital, (K) is the real capital stock and GDPR is as before. Disaggregating capital into its public and private components and distinguishing between the productivity of each component for the purpose of subsequent testing, gives:

$$\mathbf{GDPR = \sigma_1 KPRIVR + \sigma_2 KPUBR} \qquad \textbf{(4.32)}$$

where (KPRIVR) and (KPUBR) are the stocks of private and public sector capital respectively, while (σ_1) and (σ_2) represent the corresponding capital productivities.Differentiating (4.32) with respect to time gives:

$$\frac{\delta\ GDPR}{\delta t} = \sigma 1\ \frac{\delta\ KPRIVR}{\delta\ t} + \sigma 2\ \frac{\delta\ KPUBR}{\delta\ t} \qquad \textbf{(4.33)}$$

which can be expressed for the purpose of estimation as:

$$\mathbf{DGDPR = \sigma_1 IPRIVR + \sigma_2 IPUBR} \qquad \textbf{(4.34)}$$

where (DGDPR) is the change in real GDP, (IPRIVR) is real private investment (i.e. the change in real private capital stock over time) and IPUB represents real public sector investment (the change in the real public capital stock through time).

Equation (4.34) is estimated with an intercept term so that (σ_1) and (σ_2) refer only to the marginal productivity of private and public investment respectively, and not their average productivities (providing the intercept term is not equal to zero). In addition a non-zero intercept makes the productivity estimates independent of the level of investment and therefore more reliable. The results of estimating equation (4.34) are as follows (also summarised as equation {14} of Table 4.4):

$$\mathbf{DGDPR = 0.79 + 0.23\ IPRIVR - 0.30\ IPUBR}$$
$$\mathbf{(0.19)\quad (2.46)\qquad (-1.28)} \qquad \textbf{(4.35)}$$

Equations *: Change in real gdp* ***(DGDPR)****, Real Priv. Investment* ***(IPRIVR)*** *& Real Priv.Credit* ***(PCREDR)***

	{14} - DGDPR			{15} - IPRIVR			{16} - IPRIVR			{17} - PCREDR		
Vbls.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.
CONST.	0.79	0.19	0.855	7.20	1.20	0.248	-30.4	-1.66	0.119	-43.1	-3.21	0.005
R				-0.16	-2.17	0.047	-0.04	-0.56	0.583	0.19	3.18	0.005
IPRIVR	0.23	2.46	0.023									
IPUBR	-0.30	-1.28	0.217	-1.37	-4.54	0.000	-1.93	-5.28	0.000	-0.9	-2.88	0.010
PCREDR				0.70	2.67	0.018						
TCREDR							-0.20	-2.38	0.031			
GDPR							0.68	3.29	0.005			
$IPRIVR_{(t-1)}$				0.29	1.97	0.067	0.18	0.04	0.317			
GDPRLA				0.37	1.36	0.193						
$GDPR_{(t-1)}$										0.73	5.37	0.000
R-sqrd		0.48			0.89			0.89			0.67	
R bar-sqd		0.43			0.86			0.86			0.62	
D.W.		1.78									1.68	
Durbin-h					-0.07	0.94		-0.25	0.80			
F	(2,19)	8.94	0.00	(5,15)	25.54	0.00	(5,15)	25.56	0.00	(3,18)	12.4	0.00
S.E.		4.007			4.47			4.47			4.38	
n		22			21			21			22	
ser.corr	chi-sq	[1]	0.24	chi-sq	[1]	0.07	chi-sq	[1]	0.29	chi-sq	[1]	0.15
func.form	chi-sq	[1]	1.51	chi-sq	[1]	3.18	chi-sq	[1]	1.41	chi-sq	[1]	0.01
normality	chi-sq	[2]	0.73	chi-sq	[2]	1.35	chi-sq	[2]	0.58	chi-sq	[2]	0.21
heterosc.	chi-sq	[1]	1.38	chi-sq	[1]	0.41	chi-sq	[1]	0.37	chi-sq	[1]	0.03
chow	chi-sq	[4]	9.47	chi-sq	[4]	2.47	chi-sq	[4]	2.52	chi-sq	[4]	7.53

where the equation is well determined and satisfies the various tests applied to it. The productivity of private investment is positive and significant, while that of public investment is negative but statistically insignificant[35].

However Khan and Reinhart[36] caution against reading too much into the magnitude of the productivity estimates, given the possibility of feedback effects of public investment on private investment. In addition, Thirlwall (1989) points out that since changes in output are attributed only to changes in capital with labour, total productivity and other factors held constant, the investment productivity estimates (or IOCR's) will be too high. With these caveats in mind, it seems on the face of it that a ten percentage point increase in private investment allows output increases to accelerate by 2.3 percentage points. Public investment has no significant effect on changes in real output in Jamaica over the three decades covered by this study.

The net effect of public investment on private investment is now considered, using the approach of Tun Wai and Wong (1982), reviewed in section (4.1). The net effect comprises the direct real effect which public investment has on private investment, as well as the indirect financial effect via the credit market. The real private investment (IPRIVR) function used is similar to the total investment function of Chapter 3, but with the lagged dependent variable adjusted accordingly and real public investment (IPUBR) added as an explanatory variable.

$$\mathbf{IPRIVR = a_0 + a_1 IPRIVR_{(t-1)} + a_2 IPUBR + a_3 r + a_4 PCREDR + a_5 GDPRLA} \qquad \mathbf{(4.36)}$$

where the coefficient (a_2) on public investment (IPUBR) measures the direct effect of public on private investment which may be either positive or negative. It may be positive if, for example, government projects of an infrastructural nature facilitate private sector development and therefore complement private ventures. On the other hand, it may be negative if output produced in the government sector competes with private sector enterprise. There may be a real substitution or crowding-out effect of public for private investment, or a real complementary effect (where both move in the same direction), depending on the activities of the government and the response of the private sector.

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[35] Equation (4.35) comes from the definitional equation (4.33). The supply effects of Public Investment are not expected to be instantaneous.

[36] Op. Cit.

In order to measure the indirect substitution or crowding-out effect, (GCREDR) is assumed to be a positive function of public investment. This is a reasonable assumption to make and it is also consistent with equation {6} of Table (4.2), in which public sector credit is positively related to the government deficit[37]. Credit to the private sector (PCREDR) is then stated as the difference between total credit (TCREDR) and credit to the public sector (GCREDR). These relationships are summarised in equations (4.37) and (4.38):

$$\mathbf{GCREDR} = b_0 + b_1\,\mathbf{IPUBR} \tag{4.37}$$

$$\mathbf{PCREDR} = \mathbf{TCREDR} - \mathbf{GCREDR} \tag{4.38}$$

substituting (4.37) into (4.38) and (4.38) into (4.36) gives:

$$\mathbf{IPRIVR} = a_0 + a_1\mathbf{IPRIVR}_{(t-1)} + a_2\mathbf{IPUBR} + a_3\mathbf{r} + a_4(\mathbf{TCREDR} - b_0 - b_1\mathbf{IPUBR}) + a_5\mathbf{GDPRLA} \tag{4.39}$$

which can be rearranged to give:

$$\mathbf{IPRIVR} = (a_0 - a_4b_0) + a_1\mathbf{IPRIVR}_{(t-1)} + (a_2 - a_4b_1)\mathbf{IPUBR} + a_3\mathbf{r} + a_4\mathbf{TCREDR} + a_5\mathbf{GDPRLA} \tag{4.40}$$

The following reduced-form equation is then obtained:

$$\mathbf{IPRIVR} = c_0 + c_1\mathbf{IPRIVR}_{(t-1)} + c_2\mathbf{IPUBR} + c_3\mathbf{r} + c_4\mathbf{TCREDR} + c_5\mathbf{GDPRLA} \tag{4.41}$$

where:

$c_0 = a_0 - a_4b_0$

$c_1 = a_1$

$c_2 = a_2 - a_4b_1$

$c_3 = a_3$

$c_4 = a_4$

$c_5 = a_5$

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[37] See also Warman (1993)

The real public investment variable (IPUBR) in equation (4.41) measures the net effect of public investment on private investment, including both the direct effect of equation (4.36) and the indirect effect via the financial system. Financial crowding out occurs if c_2 in equation (4.41) is less than a_2 in equation (4.36). The financial crowding out effect[38] works via the reduction of credit to the private sector as a result of higher public sector investment. The reduction in private credit can be expected to have an adverse impact on private investment. If c_2 is less than a_2 and a_2 is negative, then financial crowding out strengthens real crowding out. However, if c_2 is negative but a_2 is positive, then financial crowding out offsets real complementarity. It is really an empirical matter.

The estimation results for equation (4.36) which measures the direct real effect of public on private investment (not taking indirect financial effects into account), are as follows:

$$\begin{aligned} \mathbf{IPRIVR} &= \mathbf{7.20 + 0.29IPRIVR_{(t-1)} - 1.37IPUBR - 0.16R} \\ &\quad \mathbf{(1.20)\ \ (1.97)\qquad\ (-4.54)\qquad (-2.17)} \\ &\quad \mathbf{+ 0.70PCREDR + 0.37GDPRLA} \\ &\quad \mathbf{(2.67)\qquad\ (1.36)} \end{aligned} \qquad \mathbf{(4.42)}$$

where IPRIVR is real private investment in millions of Jamaica dollars, IPUBR is real public investment (J$ millions), R is the real interest rate in percentage terms, PCREDR is real bank credit to the private sector in millions of Jamaica dollars, and GDPRLA is the lagged accelerator as before. The equation is well determined and satisfies the usual diagnostic tests (see equation {15}, Table 4.4).

As expected, credit to the private sector has a positive and significant effect on private investment, while the rate of interest has a significant negative effect (both results are consistent with the results of equations {10} and {11}, Table 4.3). The lagged dependent variable ($IPRIVR_{(t-1)}$) and the lagged accelerator (GDPRLA) both turn out to be positive but statistically insignificant, possibly because the demand side effects are captured by the strong effect of public investment (IPUBR). The coefficient on public investment is negative and significant - indeed public investment has the strongest impact of all the variables in the regression. A one million dollar rise in public investment is associated with a reduction in private investment of J$1.37 million.

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[38] As distinct from the real crowding out effect of equation (4.36)

There is significant crowding out of private by public investment in the real sector. The government of Jamaica became extensively involved in many economic activities that were previously controlled by the private sector particularly after 1972. These include the importation of a wide variety of basic foodstuffs, the importation and production of building materials, the ownership and management of hotels and guest houses, and the production of agro-industrial and industrial output. In addition, inefficiency, waste and corruption seemed to have been endemic for much of the 30 year period under review (see Chapter 3 and Stone and Wellisz, 1993), and this may have further discouraged private sector activity in areas in which the public sector became involved.

Financial crowding out is measured by the reduced-form equation (4.41), the results of which are as follows (also summarised as equation {16}, Table (4.4)):

$$\begin{aligned} \mathbf{IPRIVR} &= \mathbf{-30.39 + 0.18IPRIVR_{t-1} - 1.93IPUBR - 0.04\ R} \\ &\quad \mathbf{(-1.66)\quad (0.04)\qquad (-5.28)\qquad (-0.56)} \\ &\quad \mathbf{-0.20TCREDR + 0.68GDPR} \\ &\quad \mathbf{(-2.38)\qquad (3.29)} \end{aligned} \qquad \mathbf{(4.43)}$$

where total credit (TCREDR) replaces private credit (PCREDR) and real GDP (GDPR), which is found to give superior results, is used instead of the lagged accelerator. Private investment is partly driven by real output (GDPR) to which it is positively related. Total real credit (TCREDR) is negatively and significantly related to real private investment (IPRIVR) in equation (4.43). This is probably because of the dominant influence of public sector credit in total credit. Increases in the former lead to increases in the latter, but crowd out private investment (from equation 4.42).

The net effect of public investment (IPUBR) on private investment (IPRIVR) - taking into account the financial effect - is measured by the coefficient on (IPUBR), and is negative and significant. A one million dollar increase in public investment reduces private investment by $1.93 million. Approximately $1.37 million of that amount is attributable to the crowding out of private investment by public investment in the real sector (from equation (4.42)). The balance of $0.56 million is attributable to financial crowding out caused by the negative effect of public sector investment on bank credit to the private sector. Financial crowding out reinforces non-financial crowding out. An alternative way of verifying the existence of the financial crowding out effect is to examine directly, the effect of public investment on private credit and then the effect of private credit on private investment in equation (4.42).

The following equation is used to measure the effect of real public investment (IPUBR) on real bank credit to the private sector (PCREDR):

$$\underset{}{\mathbf{PCREDR = -43.06 - 0.90IPUBR + 0.73GDPR_{(t-1)} + 0.19R}}$$
$$\underset{}{\mathbf{(-3.21)\quad (-2.88)\qquad (5.37)\qquad (3.18)\qquad (4.44)}}$$

where all the variables are defined as before and have the expected signs. The equation is well determined and satisfies the usual tests (see equation {17}, Table 4.4). An increase of one million dollars in public investment reduces bank credit to the private sector (PCREDR) by J$0.9 million[39]. This reduction in turn lowers private investment by J$0.70 million from equation (4.42), which is close to our earlier figure of J$0.56 million. Both methods indicate that a $1.0 million increase in public investment lowers private investment through a crowding out effect in the financial sector, by around J$0.6 million.

Returning to the fifth and sixth financial liberalisation hypotheses which we set out to examine at the beginning of this sub-section, our finding is that they both hold for Jamaica. Public sector investment seems to be less productive than private sector investment in Jamaica. This probably reflects the extensive waste, ineptitude and corruption of the public sector commented on by several writers (e.g. Stone and Wellisz 1993, Levitt 1991, Brown 1981). In addition, increases in public investment reduce private investment in both the real and financial sectors. The public sector competes with the private sector for both real and financial resources.

4.3 Summary and Conclusions

This chapter has examined several hypotheses of the financial liberalisation models (particularly those of Mathieson[40], Kapur[41], and Fry[42]), and their applicability to Jamaica over the period 1960-1990. The first hypothesis that high real interest rates lower the inflation rate by raising the demand for money relative to its supply, was found not to hold for Jamaica. Neither the real interest rate nor changes in it had any significant impact on inflation.

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[39] An increase in public sector investment widens the deficit (GDEFR), which in turn puts a squeeze on credit to the private sector (see equation {8} Table 4.2, and the analysis earlier in this section).

[40] Op. Cit.

[41] Op. Cit.

[42] Op. Cit.

This conclusion has important policy implications for Jamaica. Since 1974 successive governments have raised the nominal deposit rate in an attempt to dampen inflation, increase financial savings and support the currency[43]. High interest rates have had little effect on inflation, and as Chart (4.1) and the Data Appendix to this chapter show, real interest rates were strongly negative for the majority of years since 1974. In view of our conclusion in Chapter 3 and supported in this chapter, high interest rates may be inimical to investment since they increase business costs. To be successful, any investment-oriented and anti-inflation strategy must surely take into account the ineffectiveness of high interest rates in curbing high inflation, as well as the damage that they can inflict on investment.

The second hypothesis that the difference between inflation and expected inflation reduces financial savings (via its negative effect on the real interest rate), which in turn reduces the availability of credit, does not hold for Jamaica. However, an inescapable aspect of the economic landscape after 1972 is the rapid expansion of the government sector, and the extensive waste and mismanagement of resources that ensued. Public sector expansion was not matched by growth in real output, thereby giving rise to inflationary pressures in the economy working through money supply growth and higher wage demands. Future policies to curb inflation would need to include measures to contain the size of the public sector within manageable limits and improve its efficiency, as well as measures to improve the prevailing production and trade structures. The restructuring of the agricultural and agro-industrial sectors and improving the competitiveness of exports would also have to be addressed. Rigidities in the export sector, working through the exchange rate, might also have exacerbated the inflationary climate.

Inflation is also found to have no significant effect on investment and growth in Jamaica (the fourth hypothesis tested) although there is some evidence that investment is stimulated at low levels of inflation and stifled at high levels. However, these effects were not statistically significant. This chapter also confirms the conclusions of Chapter 3 that the real interest rate has no significant effect on the real growth rate, but that it does have a significant negative effect on investment by increasing business costs.

This chapter also finds that high inflation in Jamaica widens the government deficit, as revenue does not keep pace with expenditure when inflation is high. Higher deficits lead to higher borrowing from the banking system at the expense of private sector borrowing (though this effect was found to be small). This in itself would not be catastrophic and might even be beneficial, were it not for the additional

[43] However, this last objective has come into conflict with the I.M.F sanctioned policy of devaluing the currency.

conclusion of section (4.2.3.1) that public sector investment reduces private investment, and is less efficient.

Public sector borrowing to finance high government deficits crowds out private sector borrowing from the financial system. In addition, not only does public sector investment compete with and reduce private investment, but the former is less efficient than the latter. It is therefore not surprising that Jamaica experienced many years of negative economic growth during the 1970's and 1980's precisely when the government sector was expanding rapidly.

The above conclusions have important policy implications for Jamaica. Appropriate measures to improve government efficiency, reduce political patronage and manage the selection and implementation of public sector projects more carefully, might have had a more positive impact on investment and growth. In addition, the government sector became too large too quickly and its extensive involvement in the retail, wholesale and service sectors had an adverse effect on private sector growth. Improving government efficiency and encouraging private investment are not mutually exclusive objectives. Future policy makers would be well advised to run a lean and efficient public sector and at the same time encourage private investment and initiative.

	gdpr	gdprg	m1	m1g	cpi	pcpi	fsr	r	e	er
	J$m	%	J$m	%	index	%	J$m	%	J$/us$	real (e)
1960	74.06	.	52.20	.	5.63	.	.	.	0.71	3.49
1961	75.82	2.37	46.90	-10.15	6.00	6.57	-1.00	.	0.71	3.32
1962	76.52	0.92	59.50	26.87	6.09	1.50	2.91	.	0.71	3.30
1963	79.86	4.36	58.70	-1.34	6.20	1.81	2.68	7.57	0.71	3.28
1964	86.62	8.47	63.80	8.69	6.32	1.94	1.31	2.39	0.71	3.26
1965	93.53	7.98	63.70	-0.16	6.49	2.69	1.48	2.44	0.71	3.22
1966	97.32	4.06	71.30	11.93	6.61	1.85	2.34	1.56	0.71	3.26
1967	99.33	2.06	75.70	6.17	6.81	3.03	1.60	3.99	0.72	3.30
1968	105.13	5.83	94.90	25.36	7.21	5.87	4.40	0.30	0.83	3.73
1969	112.84	7.34	111.10	17.07	7.67	6.38	3.32	-3.72	0.83	3.70
1970	120.72	6.98	126.70	14.04	8.80	14.73	2.37	1.11	0.83	3.42
1971	125.69	4.11	160.00	26.28	9.27	5.34	5.55	-17.09	0.83	3.38
1972	135.75	8.01	172.60	7.88	9.77	5.39	5.99	8.55	0.77	3.06
1973	139.84	3.01	218.30	26.48	11.50	17.71	-2.78	2.85	0.91	3.26
1974	132.45	-5.28	258.10	18.23	14.62	27.13	2.70	-19.52	0.91	2.85
1975	130.70	-1.32	322.30	24.87	17.16	17.37	-4.44	-27.55	0.91	2.65
1976	122.82	-6.03	338.50	5.03	18.84	9.79	-0.58	3.93	0.91	2.55
1977	119.84	-2.43	474.40	40.15	20.95	11.20	-4.69	9.48	0.91	2.44
1978	120.55	0.59	569.90	20.13	28.27	34.94	-4.31	-2.15	1.41	3.03
1979	118.26	-1.89	629.20	10.41	36.48	29.04	-2.79	-49.77	1.76	3.27
1980	111.52	-5.70	716.50	13.87	46.45	27.33	-0.68	-12.85	1.78	2.94
1981	114.38	2.56	774.60	8.11	52.37	12.74	6.00	-14.06	1.78	2.88
1982	115.95	1.38	876.20	13.12	55.79	6.53	8.10	11.45	1.78	2.86
1983	118.53	2.22	1065.80	21.64	62.26	11.60	7.14	12.74	1.93	2.88
1984	117.55	-0.83	1318.90	23.75	79.57	27.80	-3.08	-1.08	3.94	4.79
1985	112.03	-4.69	1520.00	15.25	100.00	25.68	2.38	-22.70	5.56	5.56
1986	109.66	-2.12	2139.70	40.77	115.11	15.11	2.48	-4.53	5.48	4.85
1987	117.99	7.60	2251.60	5.23	122.76	6.65	6.57	12.96	5.49	4.72
1988	121.68	3.12	3444.70	52.99	132.91	8.27	9.87	19.74	5.49	4.54
1989	128.85	5.90	3152.70	-8.48	151.96	14.33	1.45	9.15	5.74	4.35
1990	138.98	7.86	4015.90	27.38	185.33	21.96	-2.83	5.60	7.18	4.71
1991	137.20	-1.28	7818.00	94.68	280.00	51.08	-10.44	-2.19	12.12	.
1992	145.64	6.15	13391.00	71.28	495.93	77.12	1.81	-41.78	22.96	.

	tcredr	pcredr	gcredr	gdefr	gdefy	pcredrt	gcredrt	ir	ipubr	iprivr
	J$m	J$m	J$m	J$m	gdef/gdp	ratio	ratio	J$m	J$m	J$m
1960	8.38	13.96	-5.58	0.85	0.010	1.665	-0.665	18.47	.	.
1961	14.87	14.52	0.35	1.80	0.021	0.976	0.024	17.67	.	.
1962	16.80	13.63	3.17	2.12	0.024	0.811	0.189	17.08	.	.
1963	15.76	12.37	3.39	1.89	0.021	0.785	0.215	16.13	.	.
1964	20.68	16.52	4.16	2.39	0.026	0.799	0.201	19.15	.	.
1965	22.10	19.58	2.51	2.39	0.024	0.886	0.114	19.88	.	.
1966	22.12	20.45	1.66	2.81	0.027	0.925	0.075	23.00	.	.
1967	24.29	21.47	2.82	3.42	0.031	0.884	0.116	25.99	5.87	20.12
1968	28.10	24.06	4.04	4.17	0.037	0.856	0.144	31.90	6.98	24.92
1969	34.52	31.98	2.54	2.67	0.021	0.926	0.074	45.50	7.17	38.33
1970	36.16	31.89	4.27	3.60	0.027	0.882	0.118	41.93	8.30	33.64
1971	41.52	35.44	6.08	5.16	0.037	0.853	0.147	44.44	9.63	34.81
1972	54.03	43.02	11.01	6.08	0.041	0.796	0.204	40.33	10.61	29.71
1973	53.07	41.30	11.77	7.87	0.053	0.778	0.222	47.13	13.22	33.91
1974	45.62	38.15	7.46	11.48	0.078	0.836	0.164	35.91	19.28	16.63
1975	55.34	37.85	17.49	12.00	0.079	0.684	0.316	39.04	20.39	18.65
1976	63.75	33.46	30.30	22.20	0.155	0.525	0.475	26.06	19.35	6.71
1977	64.34	26.34	38.00	20.44	0.145	0.409	0.591	17.28	19.88	-2.60
1978	61.38	23.45	37.93	22.11	0.167	0.382	0.618	19.88	19.14	0.74
1979	69.26	21.51	47.75	17.98	0.153	0.311	0.689	22.53	16.86	5.67
1980	57.04	19.67	37.36	21.23	0.207	0.345	0.655	16.34	12.92	3.42
1981	72.50	23.69	48.81	16.71	0.165	0.327	0.673	20.57	12.45	8.12
1982	82.55	30.33	52.22	16.06	0.153	0.367	0.633	21.96	12.06	9.89
1983	96.56	34.29	62.26	15.12	0.135	0.355	0.645	24.99	12.11	12.88
1984	84.65	31.35	53.30	16.18	0.138	0.370	0.630	27.20	9.82	17.38
1985	64.82	26.13	38.69	20.03	0.179	0.403	0.597	28.37	8.74	19.63
1986	66.00	27.33	38.67	11.30	0.097	0.414	0.586	22.36	8.86	13.50
1987	55.46	32.95	22.50	.	.	0.594	0.406	30.14	9.47	20.67
1988	52.71	42.80	9.91	.	.	0.812	0.188	37.60	13.05	24.55
1989	50.12	48.90	1.22	.	.	0.976	0.024	44.03	.	.
1990	39.00	47.24	-8.25	.	.	1.212	-0.212	46.04	.	.
1991	25.98	43.26	-17.29	.	.	1.666	-0.665	43.25	.	.
1992	22.94	29.30	-6.36	.	.	1.277	-0.277	41.73	.	.

CHAPTER 5

THE EFFECTS OF CAPITAL FLOWS AND FOREIGN DEBT ON SAVINGS, INVESTMENT AND ECONOMIC GROWTH

5.1. Introduction

Foreign capital flows to developing countries form part of international saving, and are seen by recipient countries as a source of finance for economic growth. However, international saving/gnp ratios fell between 1968 and 1988 (Aghevli et. al., 1990), particularly the saving ratio of the industrialised countries as a group, which declined from 25 to 20 per cent. Fry (1995) in part attributes the decline in global saving to rising government deficits in many countries, the re-unification of Germany, the re-construction of Eastern Europe and deliberate policies by Japan, Korea and Taiwan to reduce their (balance of payments) current accounts. Shrinking world savings implies that not all countries can increase their use of foreign capital inflows to sustain domestic investment in excess of domestic saving. Developing countries as a whole are faced with reduced availability of foreign savings at a higher cost. Fry (1995) estimates that real world interest rates have risen from 1.5 per cent during 1970-1980, to 4.8 per cent over the period 1981-1991.

Developing countries have been forced to improve their saving effort (s) or reduce investment (i) in the face of declining foreign capital inflows (sf):

$$s = i - sf \qquad (5.1)$$

where s, i, and sf are respectively, ratios of domestic savings, investment and foreign savings to GDP. The structural adjustment measures adopted usually include efforts to lower the current account deficit by boosting exports or lowering imports, or both. Reducing investment and imports is likely to have an adverse effect on economic growth, while increasing exports is likely to stimulate growth.

Despite shrinking overall savings from the industrialised countries, a change in the composition of capital inflows might have a beneficial impact on growth. In the aftermath of the debt crisis of the 1980s, many developing countries sought to encourage foreign direct

investment as a replacement for foreign borrowing. The accumulation of foreign debt by developing countries can inhibit growth by placing a repayment burden on domestic savings, and can also adversely affect a country's credit-worthiness and its access to additional foreign capital if its indebtedness is too high. On the other hand, foreign direct investment appears to be more attractive, as it involves a risk-sharing relationship with foreign investors without the build-up of debt and its growth-inhibiting effects,[1] and may also be directed at more profitable opportunities.

Capital inflows in Jamaica grew steadily during the 1960s and the first half of the 1970s. Thereafter they behaved erratically as political instability undermined both domestic confidence and foreign direct investment. At the same time as foreign direct investment became unpredictable, foreign loans to the public sector increased substantially during the period 1975 to 1989, mainly under IMF and World Bank programmes. Foreign public debt stood at around 103 million Jamaica dollars in 1970. By 1989 foreign public debt outstanding was 2.9 billion Jamaica dollars.

This chapter examines the effect of foreign capital flows and foreign debt on savings, investment and economic growth. In so doing, a brief review of the relevant theoretical and empirical literature is presented. Sections (5.2) and (5.3) consider the effect of foreign capital inflows and foreign debt on domestic savings and investment respectively. In addition, the question raised by Fry (1995) concerning the stabilising or destabilising effect of foreign capital inflows (in the sense of improving or worsening the balance of payments), is examined. Section (5.4) analyses the impact of both foreign capital inflows and capital outflows (including capital flight), on economic growth. In order to take account of the effect of capital flight and capital outflows in general on growth, the concept of the net transfer of resources is considered. In the presence of financial repression capital flight may take place in various ways, such as through the over-invoicing of imports and under-invoicing of exports. Pastor (1990) argues that capital flight retards growth not only because part of domestic savings is no longer available for investment, but also because capital flight reduces the amount of foreign exchange available for imports of intermediate goods.

[1] .However, repatriated profits may in time equal or exceed foreign debt service outflows.

Section (5.5) examines the empirical evidence regarding the effect of capital flows and foreign debt on savings, investment and growth in Jamaica. Section 5.6 summarises the main findings and conclusions of the chapter.

5.2. *The Effect Of Foreign Capital Inflows and Foreign Debt On Domestic Savings*

Two broad views of the effect of foreign capital inflows on domestic savings have been put forward in the economic literature. The first holds that foreign capital inflows have a positive and possibly stabilising impact on domestic savings. Foreign capital inflows are assumed to be used only for investment, relieving the constraint on domestic savings experienced by many developing countries. The analysis is often conducted in a dual-gap framework in which the two resource gaps are the savings and foreign exchange gaps (Chenery, et al 1966; Thirlwall, 1989).

In the second view, foreign capital inflows may be used in part for consumption and may lower domestic savings by encouraging consumption. In addition, (Fry, 1995) argues that the negative effect of foreign capital on domestic savings can be de-stabilising. Savings ratios can decline significantly and current account[2] deficits widen substantially, even in the presence of high real interest rates.

The dual-gap model assumes that domestic savings cannot be substituted for foreign savings. Many developing countries face a foreign currency shortage which cannot be met by simply transferring domestic savings into foreign currency. In the long run export performance may need to be improved and import ratios reduced. However, in the short run the foreign exchange constraint can be overcome by foreign capital inflows.

In addition to the foreign exchange gap, a country may experience a shortage of domestic savings relative to a given investment ratio required for a particular target rate of growth. The savings and foreign exchange constraints can be expressed using the Harrod-Domar growth equation:

$$g = \sigma s \qquad (5.2)$$

[2].of the balance of payments.

where g is the growth rate, σ is the incremental output-capital ratio, and s is the domestic savings ratio (to GDP).

If the foreign savings ratio to GDP (sf) is positive and σ and s do not decline then the foreign savings ratio becomes an additional stimulant to growth:

$$g = \sigma (s + s f) \qquad (5.3)$$

If the target growth rate is set at g^*, then the required savings ratio is $s^* = \frac{g^*}{\sigma}$. However, if actual savings fall short of required savings, then the savings gap has to be financed by foreign savings: $s^* - s = sf$.

Considering the relationship between imports and growth, the rate of growth may also be expressed as follows:

$$g = \beta m \qquad (5.4)$$

where β is the incremental output-import ratio and m is the import-GDP ratio. Once again, sf becomes an additional influence on growth if β and m do not decline:

$$g = \beta(m + s f) \qquad (5.4)$$

If actual imports that can be financed by exports fall short of the level of imports (m^*) required for the target rate of growth, then: $m^* - m = sf$. In order to achieve the target rate of growth, foreign savings must relieve either the savings or the foreign exchange constraint.

One of the problems with the above dual-gap analysis is that even though foreign capital inflows are apparently of the right magnitude to finance some given growth rate, there may be an adverse effect on s, σ,βor m. Such an adverse effect of foreign savings may offset any positive impact on growth. Alternatively, foreign savings might work in the opposite direction and have an even more beneficial effect on growth.

Griffin (1970) argues that some proportion of foreign capital inflows (say α), will be consumed rather than invested. Consequently, the increase in the growth rate in equation (5.3) is "$(1 - \alpha)fs\sigma$", where α is the proportion of foreign savings consumed and is assumed to have the property $0 < \alpha < 1$. The expression $(1 - \alpha)fs\sigma$, is lower than $sf\sigma$. Foreign savings still have a positive effect on growth, but they can have a negative effect on domestic savings. Griffin argues that high levels of foreign capital inflows to the public sector can cause the government to lower its savings effort and increase its consumption. In addition, the saving effort of the private sector may be reduced if finance becomes too easy as a result of substantial foreign inflows. Also, the availability of foreign savings may allow the government to maintain an overvalued exchange rate thereby stimulating imports, discouraging exports and reducing domestic savings.

Griffin also suggests that foreign capital to the public sector is often used for political projects or for economic infrastructure. Such projects have low output-capital ratios which may lower the variable σ in equation (5.3), and reduce the impact of foreign savings on growth. However, Kennedy and Thirlwall (1971) argue that the overall output-capital ratio of the economy may rise because of the external benefits of infrastructural projects which admittedly have low output-capital ratios.

Weisskopf (1972) argues that given domestic income, the partial use of foreign savings for consumption reduces planned domestic savings. He tests the impact of foreign savings on domestic savings in 17 saving-constrained developing countries for the period 1953-1966. The following are his results using panel data for the above period across the 17 countries:

$$\mathbf{S = a + 0.183\ (Y) - 0.227\ (F) + 0.176\ (E)}$$
$$\mathbf{(6.59)\qquad (-5.3)\qquad (4.6)\qquad (5.6)}$$

where S is domestic savings, Y is GDP, F is foreign savings, E is exports, and the t-statistics are in brackets. Weisskopf interprets the negative coefficient on F to mean that some proportion of foreign savings, in this case 22.7 per cent, is being consumed. Foreign capital reduces domestic savings by roughly the amount of the foreign capital that is used for consumption. Newlyn (1985) also holds the view that in equations like (5.6) the coefficient on foreign savings should be interpreted as the marginal propensity to consume out of foreign savings.

The view of Griffin (1970) and Weisskopf (1972) that foreign savings have a negative impact on domestic savings has been challenged on both theoretical and statistical grounds. Polak (1989) argues for a more dynamic approach since the productive investment of foreign savings would give rise to an increase in savings over time and to a lesser need for foreign capital. In addition aid, a component of foreign savings, is often allocated on the basis of need, the determination of which makes use of various criteria including domestic savings rates. The lower the rate the higher the amount of aid that would be forthcoming. Kennedy and Thirlwall (1971) make a similar point.

A negative relationship between domestic savings and foreign savings may well exist, but Polak[3] maintains that it certainly does not imply any causal link from foreign to domestic savings. Indeed, for the reasons described in the preceding paragraph the direction of causation may well be from domestic savings to foreign savings. Bowles (1987) uses Granger causality tests on data for 20 developing countries for the period 1961-1981, in order to determine the direction of (Granger) causation between foreign and domestic savings. His equations are:

$$\left(\frac{S}{Y}\right)_t = C + \alpha\left(\frac{A}{Y}\right)_{t-1} + \beta\left(\frac{S}{Y}\right)_{t-1} \qquad (5.7)$$

$$\left(\frac{A}{Y}\right)_t = C + \gamma\left(\frac{S}{Y}\right)_{t-1} + \lambda\left(\frac{A}{Y}\right)_{t-1} \qquad (5.8)$$

where $\frac{S}{Y}$ is the ratio of domestic savings to income, and $\frac{A}{Y}$ is the foreign exchange ratio. No correlation between domestic and foreign savings was found in half the countries, while two-way Granger causality was found in two countries. Domestic savings were found to have a positive impact on foreign savings in three countries, while foreign savings were found to have a negative impact on domestic savings in five countries. In general the relationship between foreign and domestic savings seemed to depend on the circumstances of particular countries.

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[3].Op.Cit.

Fry (1995) argues that foreign savings in the form of foreign loans to the public sector can either raise or reduce domestic savings depending on the size of the public debt. If outstanding debt is at a relatively moderate level, an increase will cause domestic real interest rates to rise moderately to compensate foreign capital owners for a higher perceived risk from possible default. He contends that moderately higher interest rates stimulate savings[4] and have a negative but small effect on investment and growth. The negative effect is not large enough to offset the effect on savings. The overall effect is a positive one between debt and savings. A rise in debt in one period leads to an increase in savings in the next.

Fry[5] also argues that on the other hand, high levels of public debt have two effects. Firstly, they cause bigger rises in interest rates and reductions in investment and growth, which in turn reduce savings (ie shift the savings function). The reduction in savings more than offsets the rise in quantities saved as represented by the movements along the relevant savings curve.

Secondly, Fry (1995) argues that savers may perceive that a high and rising foreign debt ratio may lead to measures, including devaluation, to stimulate exports. The real return on assets held abroad may then be relatively higher than the return on domestic assets (ceteris paribus). The result might be capital flight perhaps undertaken via the mechanisms of under-invoicing of exports and over-invoicing of imports. Measured domestic savings would then be reduced. As domestic savings are measured by investment less the (negative of the) current account deficit, capital flight would reduce measured savings.

In general Fry's view is that low levels of debt could lead to a positive correlation between public sector foreign borrowing and domestic savings, while high outstanding debt gives rise to a negative correlation. It is the level of outstanding debt that influences the behaviour of economic agents and gives rise to a positive or negative relationship between debt and savings. In a panel study of 28 developing countries for the period1967-1985, Fry (1995) finds that on average, higher foreign debt increases national savings at debt-GNP ratios below 0.314, while debt ratios above 0.314 reduce national savings.

[4] We have already found in Chapter 3 that this does not hold for Jamaica.
[5] Op. Cit.

Given our finding in Chapter Three that the real interest rate has no significant effect on saving in Jamaica, we would not expect debt to affect savings via the interest rate, as argued by Fry (1995). However, we found in Chapter Four that high public debt ratios widen the government deficit, which in turn lowers investment and growth particularly as private investment is crowded out by public investment which is less efficient than private investment. Since savings are largely determined by income as found in Chapter Three, lower growth is inimical to savings. Ultimately then, high public debt ratios built up to finance high public deficits, might have an adverse effect on savings.

Chapters three and four also found that high interest rates discourage investment. If high interest rates are required to compensate foreign creditors for increased loans, domestic investment might fall. This might in turn lead to lower savings. Thus higher debt might have a negative effect on domestic savings via its effect on investment. Also, as discussed above, Fry argues that higher debt might lower measured savings in the presence of capital flight (if such outflows are effected via under and over invoicing of exports and imports respectively). In addition, actual savings might decline since capital flight represents lost resources that might otherwise have been saved/invested.

The view that foreign savings have a negative impact on domestic savings has also been challenged on statistical grounds. Polak (1987), Thirlwall (1989) and Chandavarkar (1990), all argue that the perceived negative relationship between foreign and domestic savings is unreliable. This is so because of the way in which domestic savings are measured and the link between domestic and foreign savings in the national accounts.

Returning to identity (1), domestic saving S (where S = Y-C = I + X - M from the national accounts) is equal to investment less foreign savings, where foreign savings is the negative of the current account deficit:

$$\mathbf{S = I - SF} \qquad \mathbf{(1)}$$

Domestic saving remains constant if an increase in foreign saving is fully invested. However, if some proportion of an increase in foreign saving is consumed, then domestic saving would have to decline in order to maintain the identity. Thus in a statistical sense, a negative correlation between foreign savings and domestic savings is inevitable. In effect, at least in terms of how

they are measured, domestic savings and foreign savings are not independent of one another. In view of this link several studies have attempted to examine the role of foreign savings, not as an exogenous determinant of domestic savings, but as an endogenous variable determined simultaneously with domestic savings.

Morisset (1989) tests the endogeneity of foreign savings on data for Argentina over the period 1960-1981. Morisset examines the dependence of domestic savings and foreign savings separately, on a selection of internal and external factors. The internal factors used were the rate of growth of the money supply (u), and the public sector deficit (B). They were chosen for their importance as monetary and fiscal instruments used by the government in its conduct of economic policy. The external factors were variations in the terms of trade (Υ), and changes in external interest rates (r^*), and were chosen because they seemed to "hit Argentina with the greatest force" over the period. Ordinary least squares estimation was used and the results are as follows:

$$\begin{aligned} S = {} & 10.13 - 0.034\Upsilon - 0.747B + 0.034u + 0.200r^* \\ & (1.37) \quad (2.03) \quad (6.15) \quad (1.72) \end{aligned}$$

$$R^2 = 0.88, \qquad D\,W = 1.67 \qquad (5.9)$$

where S is gross domestic savings. The results of regressing foreign savings on the same independent variables are as follows:

$$\begin{aligned} F = {} & -1.54 + 0.0122\Upsilon + 0.674B + 0.0085u + 0.150r^* \\ & (0.07) \quad (2.72) \quad (2.26) \quad (1.90) \end{aligned}$$

$$R^2 = 0.42, \qquad D\,W = 1.66 \qquad (5.10)$$

Morisset finds that the estimated coefficients on the internal factors are all significant. Fiscal policy affects S negatively and F positively, while monetary policy affects both S and F positively. The terms of trade do not seem to have any effect on S and F, while changes in the external interest rate have positive effects on S and F but are not significant at the 5 per cent level.

Morisset concludes that both S and F are determined simultaneously by exogenous monetary and fiscal policies, and that the perceived causal relationship between foreign and domestic savings had been misrepresented in the past. He also suggests that excluding significant explanatory variables from equations purporting to explain domestic savings might give undue weight to the importance of foreign savings. He regresses domestic savings on foreign savings, with and without other key variables such as the inflation rate, the export growth rate, the real interest rate, and foreign savings disaggregated into Aid and Foreign Direct Investment. The inclusion of the additional variables resulted in foreign savings losing its statistical significance.

Snyder (1990) tests the proposition that both the domestic savings ratio and the aid ratio are determined by per capita income. He regresses the savings ratio on per capita income and the aid ratio for fifty low and middle income countries over the period 1960-1983. He in turn regresses the aid ratio on per capita income and the savings ratio. Snyder does not find any significant relationship between aid and domestic savings. However, he does find that per capita income has a positive and statistically significant effect on both domestic and foreign savings. He suggests that the negative correlation between foreign and domestic savings reported in the economic literature is spurious, and that both those variables are simultaneously determined by per capita income.

The majority of studies on the role of foreign savings on domestic savings have either considered aggregate foreign savings or have chosen a single component of foreign capital inflows, such as foreign loans, foreign direct investment, foreign aid, etc. Foreign savings may be disaggregated into public sector foreign debt, public sector grants, private direct investment, private sector loans, and changes in foreign exchange reserves, and they could have varying effects on savings. The problem of course is that reliable and comprehensive disaggregated data are not always available for developing countries. Also, the precise reasons underlying the effects of disaggregated foreign savings variables may be less obvious. For instance Papaneck (1973) finds a negative correlation between aid, and foreign private investment and other foreign inflows on the one hand, and savings on the other in his study on Latin America. Data unavailability precluded further disaggregation. He argues that the sign on the aid coefficient may be caused by both aid and savings being co-determined by exogenous factors. However,

he explains away the negative coefficient on foreign private investment by suggesting that it may be overestimated. Given GDP, measured savings might be lower.

Fry (1995) tests the simultaneous impact of foreign direct investment and foreign liabilities on the national savings ratio for a panel of 16 developing countries between 1965 and 1988. The results are as follows:

$$\underset{}{SNY_t} = \underset{(-6.845)}{-\ 0.650\ (FDIY)_t} \underset{(-3.651)}{-\ 0.021\ (FLY)_{t-1}} + \underset{(8.420)}{0.155\ (YG)_t}$$

$$+ \underset{(3.509)}{0.122\ (RW)_t} + \underset{(21.251)}{0.640\ (SNY)_{t-1}}$$

$$R^2 = 0.858 \qquad (5.11)$$

where the t-statistics are in brackets below the coefficients, (SNY) is the national savings ratio, (FDIY) is the ratio of foreign direct investment to GNP, (FLY) is the ratio of net foreign liabilities (or net foreign debt) to GNP, (YG) is the growth rate of GNP, and (RW) is a proxy for the world interest rate. Increases in both the foreign debt and foreign direct investment ratios reduce the national savings ratio

Fry divides the 16 countries into 5 Pacific Basin countries and a "control" group comprising the other 11. When the regression is re-run for each group, he finds that foreign direct investment in the Pacific Basin countries does not have any significant effect on savings. It is foreign direct investment in the other countries (mainly Latin American) that is responsible for the strong negative effect for the group as a whole. He further allows the foreign direct investment ratio to interact with variables representing the black market exchange premium, the degree of openness of the economy, the investment climate, and the lagged foreign debt ratio. Fry finds that a poor investment climate and a small degree of openness have a negative effect on national savings. In such circumstances, an appropriate policy stance would be to improve domestic confidence and the climate for investment, and induce greater openness of the economy to competitive external forces.

In the light of the various studies reviewed above, section 5.5.2 examines the question of whether or not foreign capital inflows have any effect on domestic savings in Jamaica. In

addition, foreign capital inflows are broken down into public sector inflows comprising government borrowing and grants, and private inflows comprising foreign direct investment and private unrequited inflows. The effect of the components of capital inflows on domestic savings is also tested in section 5.5.2.

5.3 Foreign Savings, Foreign Debt and Investment

The effects of foreign savings on investment seem to depend on the type of foreign savings and, some authors maintain, on the recipient sector. Foreign savings in the form of loans, aid or foreign direct investment have different effects on investment. In addition, as described earlier in this chapter, the dual-gap framework assumes that foreign savings does not affect the output-capital ratio. Others argue that the productivity of capital (ie the inverse of the output-capital ratio) is affected, depending on whether the private or public sector is the recipient of the foreign savings. Irrespective of the effect of foreign savings on the quantity of investment, the quality of investment and therefore economic growth may still be affected by changes in the capital-output ratio.

Massell, et. al. (1972) test the proposition that foreign capital inflows have a positive effect on capital formation, since they reduce the foreign exchange constraint and permit imports, including imports of intermediate goods, to increase. Their panel study on 11 Latin American countries covers the period 1955-1966. The dependent variable is the change in domestic investment, while the explanatory variables are changes in exports (Δx), net public capital inflows (ΔG) and net private capital inflows (ΔP):

$$\Delta I_t = 0.23 + 0.093\ (\Delta X)_t + 0.36\ (\Delta G)_t + 0.38\ (\Delta G)_{t-1}$$
$$(1.38) \quad (1.43) \qquad (1.27) \qquad (1.39)$$

$$+ 0.545\ (\Delta P)_t + 0.422\ (\Delta P)_{t-1}$$
$$(6.88) \qquad (3.03)$$

$$R^2 = 0.382 \qquad (5.12)$$

Public sector capital inflows are not statistically significant, indicating in the view of Massell et. al. that public foreign savings are used in long-term projects. Short-run changes in

investment are not heavily influenced by public foreign savings. On the other hand, there is a tendency for private foreign savings to go directly into investment.

Fry (1995) argues that foreign debt accumulation and foreign direct investment have different effects on domestic investment. In its early stages, foreign public debt accumulation can stimulate investment if the government attempts to raise foreign exchange earnings as debt service increases. Businesses may perceive the existence of potentially profitable opportunities in the export sector. In addition, the overall productivity of capital may rise as a result of the external benefits of infrastructural projects on which foreign public loans are usually spent.

As the stock of debt becomes large, debt accumulation may have a negative effect on domestic investment. High debt-service obligations may reduce the resources and incentives to the private sector and curtail their desire to increase investment (Fry, 1995, Krueger 1987). The possibility of higher taxes in the future to help finance the debt may even reduce current investment.

Fry tests these conflicting influences of foreign debt accumulation on investment. Both the government debt and the debt ratio squared are included as explanatory variables in the following investment equation which employs panel data:

$$(IKY)_t = 0.323\ (YG)_t - 0.058\ (RW)_t + 0.035\ (TTL)_{t-1}$$
$$(3.065) \qquad (-1.223) \qquad (4.429)$$

$$+ 0.033\ (REXL)_t + 0102\ (DETY)_t - 0.093\ (DETY)^2$$
$$(1.728) \qquad (2.794) \qquad (-2.308)$$

$$- 0.033\ (DCGR)_t + 0.029\ (DCPY)_t + 0.667\ (IK)_{t-1}$$

$$R^2 = 0.862 \qquad Q(4) = 13.257 \qquad (5.13)$$

The sample covers a selection of 28 developing countries with the data spanning the period 1967-1985. (IKY) is the ratio of domestic investment to GNP, (YG) is the rate of growth of GNP, (RW) is a proxy for the world real interest rate[6], (TTL) is the terms of trade in natural

[6].RW is the 6-month LIBOR deposit rate of interest minus US inflation, continuously compounded.

logarithms[7], (REXL) is the real bilateral exchange rate with the US dollar, (DCGR) is the ratio of net domestic credit to government to total domestic credit, and (DCPY) is domestic credit to the private sector/GNP. The t- statistics are in parentheses beneath the coefficients, and the Box-Pierce Q statistic indicates the absence of any significant serial correlation.

Fry finds that the investment ratio is increased by faster growth in real (YG), improvements in the terms of trade (TTL) in the previous time period, and higher real exchange rates (REXL) which make imported intermediate goods cheaper. Changes in real domestic credit to the private sector (DCPY) have a positive but insignificant effect on investment, while the net government credit ratio (DCGR) reduces investment possibly by crowding out private investment.

Fry finds that the foreign debt ratio $(DETY)^2$ reduces the investment ratio after debt/GNP exceeds 0.54 for the reasons described above. When the debt ratio is lower than that critical value, (DETY) tends to raise the investment ratio, again for the reasons cited above.

Turning now to the role of foreign direct investment, the majority of studies seem to take it for granted that an increase in private direct foreign investment has a direct impact on capital formation and automatically increases investment. However, Dooley (1990) points out that foreign direct investment is a flow-of-funds concept and that a high degree of fungibility and substitutability is associated with such flows. Consequently, foreign direct investment may simply substitute some other flow without increasing capital formation.

In addition, there are costs associated with foreign direct investment that may distort the domestic economy and affect the domestic investment climate. Not only do repatriated profits increase at higher levels of foreign-owned capital, but the programme of incentives to reduce the risk to foreign direct capital may have an adverse impact on domestic investment.

In general foreign direct investment may be autonomous by increasing capital formation, may be accommodating by providing additional balance of payments financing, or neither if it offsets a decline in some other kind of capital flow.[8]

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[7].The export price index/import price index.

[8].Fry (1995), p.86

Fry (1995) uses iterative three-stage least squares on panel data to estimate investment and to test the effects of foreign debt and foreign direct investment on the domestic investment ratio for 16 developing countries over the period 1965-1988. He finds that both foreign debt and foreign direct investment have a significant negative effect on domestic investment.

Fry splits his sample into two subsets: one containing five Pacific Basin countries and the other having the eleven remaining countries. The Pacific Basin countries are Indonesia, Korea, Malaysia, the Philippines and Thailand.

Fry finds that the significant negative effect of foreign direct investment on domestic investment can be attributed to the remaining group of eleven countries comprising mainly Latin American countries. He argues that in many of those countries foreign direct investment was explicitly used for debt-equity swaps and not to stimulate capital formation. Indeed, capital formation fell as potential domestic investors took a wait and see attitude to the privatisation and reform measures that accompanied the debt-equity swaps.

Fry also finds that foreign direct investment stimulates domestic investment, in the Pacific Basin countries, and argues that foreign direct investment is not a close substitute for other forms of capital flowing into those economies as found by Rana and Dowling (1990). The stable investment and macroeconomic climate associated with those countries over the period may have contributed to the stimulating effect of foreign direct investment on domestic investment.

Section 5.5.3 considers the empirical evidence on Jamaica, concerning the effect of foreign capital, its components (particularly foreign direct investment) and the stock of foreign debt, on domestic investment.

5.4 Capital Flight, the Net Transfer of Resources and Economic Growth

As seen in sections 5.1 and 5.2 of this chapter, net foreign savings allow investment to take place in excess of domestic savings (see equation 5.1). However, the extent to which investment in turn affects economic growth depends on the magnitude of offsetting factors. In particular, a decrease in domestic savings, leakages of savings out of the economic system, or a lowering of the output - capital ratio (see equation 5.3 above), will reduce any stimulating effect of foreign savings on investment and growth. Earlier sections of this chapter examined the debate on the question of the effect of foreign capital inflows on savings. The debate on the effect of foreign savings on the output - capital ratio was also considered. This section examines the effect of foreign savings on growth, taking into account the role of net outflows of factor incomes and capital flight.

Whether or not foreign capital inflows have an adverse impact on the saving motives of domestic economic agents, possible leakages of savings imply a smaller pool of domestic resources available for investment. "Legal" leakages might include interest payments on external debt, repatriated profits, and other net factor payments abroad. They may also have an adverse effect on growth if they become a drain on foreign exchange and hinder imports of intermediate goods (Pastor, 1990). The greater the stock of external debt or foreign direct investment accumulated from past capital inflows, the higher will be the outflow of resources required to service the debt or provide profit income to foreign owners of capital.

Capital flight may also constrain investment and growth by reducing available resources, including foreign exchange. It is difficult to distinguish between capital flight - "abnormal" speculative flows - and "normal" movements of international capital. Various definitions of capital flight give widely differing estimates of its magnitude (Khan and Ul Haque, 1985; Dooley, 1988; Warman, 1993). The precise definition and measurement of capital flight should not be arrived at "independently of the policy question that inspired concern with the issue in the first place" (Gibson and Tsakalotos, 1990). Alternative measures of capital flight will be examined later in this section.

Capital flight may be encouraged by an inhospitable domestic investment climate which in turn may affect business confidence adversely. Political instability often contributes to the decline in confidence, as do well-intentioned but detrimental economic policies. In the context

of our discussion on the effect of foreign savings on growth, Fry (1985) argues that savers may expect the government to devalue a country's currency and take other measures to reduce the current account in the face of a high and rising foreign debt. A devaluation would raise the real return on assets held abroad and lower the return on domestic assets, thereby encouraging capital flight. Looked at in this way, capital flight may be associated with foreign savings in the form of high and increasing levels of foreign debt.

5.4.1 Foreign Capital Flows, Factor Payments and Economic Growth

It has been suggested in the previous sub-section that any positive effect of net capital inflows[9] on growth may be offset by net outflows of factor incomes. Of particular relevance are interest payments to service foreign debt and profit remittances to owners of capital. Bacha (1992) makes use of the concept of "net transfers" which dates back to the 1920's (Keynes, 1929; Ohlin, 1929), to take account of the net factor income flows. Net transfers (N) are defined as the difference between net capital inflows (F)[10] and net factor services to abroad (J): $N = F - J$.

Bacha[11] argues that most developing economies are credit-constrained in the sense that foreign capital inflows (F) are determined by decisions made abroad. In addition, net factor income flows (J) depend on the accumulated external debt of the particular country concerned and on world interest rates. Therefore (J) is also given for most developing countries. Therefore, net transfers are beyond the control of developing countries and their dependence on decision makers abroad imposes limitations on the capacity of developing countries to spend, invest and grow. In assessing the impact of foreign capital inflows on investment and growth, not only are net transfers (N) the relevant variable, but their effects on investment and growth are determined by factors exogenous to the economy.

Bacha's approach may be criticised on two grounds. Firstly, although the use of net transfers instead of net capital inflows seems appropriate, the analysis of (F) is undertaken only

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[9] i.e. net of capital outflows. Net capital inflows are used as our proxy for foreign savings.

[10] Where (F) is equivalent to the excess of imports over exports of goods and non-factor services, with an opposite sign. F includes the change in international reserves of the Central Bank.

[11] Op. Cit.

in terms of debt and that of (J) only in terms of interest (and related) income flows. Other forms of capital inflow (F) are not explicitly analysed: foreign direct investment, aid, etc., nor are other kinds of factor payment flows such as profit income. The economic behaviour of owners of capital in the form of foreign direct investment and of factor income in the form of profits, may well give rise to a different outcome for (N) than if debt and interest income alone are considered. The implications for investment and growth may also be different.

Secondly, the assumption that foreign capital inflows and net factor income flows are exogenous is not supported by several studies examined in section 5.3. (Morisset, 1989; Snyder, 1990; Fry, 1995).

Thirlwall (1994) develops a model of capital imports and growth, which makes use of the concept of the net transfer of resources. He shows that capital imports stimulate real output growth if new inflows of foreign capital are greater than the outflow of domestic saving to pay interest. However, if interest payments are financed by new borrowing, foreign capital inflows always have a positive effect on growth. In addition, Thirlwall [12] also shows that higher growth of national income occurs if the productivity of capital imports exceeds the rate of interest. His model is as follows:

$$\mathbf{O = Y + rD} \qquad \textbf{(5.14)}$$

where O is domestic output, Y is national income, r is the average rate of interest on foreign borrowing, and D is external debt. Factor payments abroad represented by rD, make up the difference between national income and domestic output. Given the interest rate on foreign borrowing, a change in output can be expressed as:

$$\mathbf{\Delta O = \Delta Y + r\Delta D} \qquad \textbf{(5.15)}$$

where Δ represents a change in output, income or debt. However, by definition a change in output is equal to the productivity of capital times investment:

$$\mathbf{\Delta O = \sigma I} \qquad \textbf{(5.16)}$$

[12] Op. Cit.

where σ is the productivity of capital. Investment is in turn financed by saving out of output and foreign debt net of that proportion of foreign interest payments that would otherwise have been saved:

$$\mathbf{I = sO + \Delta D - srD} \qquad \textbf{(5.17)}$$

where s is the propensity to save. Substituting equation (5.17) into (5.16) and dividing it by O gives an expression for the growth of output:

$$\frac{\Delta o}{o} = \sigma\left(s + \frac{\Delta D - srD)}{o}\right. \qquad \textbf{(5.18)}$$

Equation (5.18) shows that as long as capital inflows (ΔD) exceed that proportion of interest payments on external loans that would otherwise have been saved (srD), output growth is greater than that obtainable from domestic savings alone. If interest payments on foreign debt are financed by more foreign borrowing, (rD = ΔD), foreign capital inflows will always have a positive effect on growth (providing s<1 as is the case normally). In practice countries are not permitted to reschedule their debts indefinitely and borrowing repeatedly to meet interest payments may result in a loss of credit-worthiness.

Section 5.2 examined the debate surrounding the effect of foreign capital inflows on the propensity to save and on the productivity of capital (the inverse of the capital-output ratio). If capital inflows cause either ratio to fall, then the positive effect of capital imports on growth outlined in equations (5.14)-(5.18) may be partially or completely offset. Indeed, growth may even decline if the reductions in σ and s are sufficiently large. Griffin (1970) and Weisskopf (1972) argue that foreign capital inflows reduce savings, while Kennedy and Thirlwall (1971), Polak (1989), Chandavarkar (1990) and Thirlwall (1994) argue the opposite and challenge the findings of Griffin and Weisskopf on both statistical and theoretical grounds. The work of Boules (1987) , Morisset (1989), Snyder (1990), Fry (1995) and others, suggests that ultimately the question may be an empirical one which depends on prevailing economic conditions. With regard to the productivity of capital σ, Griffin[13] argues that foreign capital inflows reduce σ because of the high capital intensity of projects financed by foreign capital.

[13] Op. Cit.

Papanek (1973), Kennedy and Thirlwall (1971) and Thirlwall (1994) argue that, despite the capital intensity of individual projects financed by foreign capital, the productivity of capital for the economy as a whole is not necessarily adversely affected by capital imports. Indeed, it may actually rise because of beneficial externalities and an improvement in the availability of foreign exchange which allows more productive use to be made of capital resources as a whole.

Equation (5.18) shows the circumstances under which foreign capital inflows can influence growth, taking into account interest payments on the accumulated foreign debt. Foreign capital inflows on the one hand and factor payments on the other, include foreign debt and interest payments respectively. Other forms of capital imports (eg FDI[14] and aid) and factor payments (eg repatriated profits) are not explicit in the model, but may be taken into account. The model gives important insights into the way in which foreign loans can stimulate growth and the manner in which factor payments may moderate the positive effects of capital imports.

Capital flight is not explicitly included in the net transfers concept used by Bacha (1992) or the model developed by Thirlwall (1994), but it can be easily incorporated. There is no generally accepted definition of capital flight and several alternative approaches have been developed to measure its magnitude. It is undoubtedly important in many developing countries where government policy and economic conditions in general encourage the export of capital to avoid the risk of holding it in domestic assets. Capital flight reduces the resources available for investment and growth, and ought to be taken into account in assessing the impact of net transfers of resources on economic growth. The next sub-section examines the role of capital flight, while section 5.5 incorporates capital flight in the models used to empirically test the effect of capital inflows in Jamaica.

5.4.2 Capital Flight, Net Transfers of Resources and Economic Growth

Capital flight occurs "when the expected returns from holding money abroad are higher or safer than at home" (World Bank, 1985).[15] This motive for capital flight is close to the definition given by Gibson and Tsakalotos (1990), that capital flight is a response on the part

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[14] Foreign Direct Investment.

[15] World Development Report, 1985 (World Bank).

of economic agents to a perceived increase in the risk of holding domestic assets. It is often associated with a number of factors, including an overvalued exchange rate which lowers the price of foreign relative to domestic assets.[16] An overvalued exchange rate may also lead to the expectation of a devaluation, thereby encouraging speculative capital outflows. A policy reaction by the government to tighten exchange control may exacerbate the problem. High and volatile inflation which creates uncertainty and reduces real interest rates may also encourage capital flight, especially if it is accompanied by repressive financial policies that keep real interest rates negative.

Knowing some of the factors that are often related to and often accompany capital flight does not make its measurement any easier. Perhaps the view of Gibson and Tsakalotos (1990) that the appropriate definition and measure of capital flight is probably related to the policy question being considered, is the most useful approach to take. The question being considered here is the extent to which capital flight reduces the resources (i.e. savings) available to a country for investment and growth, and ultimately, what policy measures are open to the government to tackle the problem. Some alternative measures of capital flight will be examined below while the precise measure adopted will be dealt with in the next section on the empirical findings for Jamaica.

Two broad approaches have been developed to measure capital flight: the direct and indirect approaches. The latter does not distinguish between "abnormal" speculative flows and flows associated with "normal" international capital movements. The World Bank (1985) uses the indirect approach, defining capital flight as the sum of gross capital inflows (external debt plus FDI) and the current account deficit, less increases in official foreign reserves. In effect, capital inflows in excess of those used to finance a current account deficit or an increase in reserves must be held abroad by the private sector and is considered to be capital flight. The Morgan Guaranty Trust method (Anthony and Hughes, 1992) subtracts the acquisition of short-term financial assets by banks, on the grounds that they cannot be reasonably considered to be capital flight.

An alternative to the indirect residual approach of the World Bank and Morgan Guaranty, is the more direct approach taken by Dooley (1988) and Cuddington (1986). They

[16] Gibson and Tsakalotos, op. cit.

make a distinction between "capital outflows motivated by normal portfolio decisions and those based on the desire to place assets beyond the control of domestic authorities" (Dooley, 1988). Dooley defines capital flight as the stock of claims on non-residents that do not generate receipts of investment income that are recorded in the balance of payments accounts. Capital flight is measured by the difference between total foreign claims and that subset of foreign assets that generate reported income. In addition, Dooley adds the errors and omissions figure from the balance of payments accounts on the grounds that they represent capital flight, and the difference between the World Bank's and the country's external debt figure on the assumption that the World Bank's figure is more accurate. Cuddington (1986) calculates capital flight by adding only short-term private capital flows to net errors and omissions. His view is that capital flight is essentially a short-term phenomenon.

Capital flight can be incorporated into the concept of the net transfer of resources developed above. The balance of payments equation shows that the deficit on trade and services (M - X) plus net factor payments (NFP) equal net capital inflows (F): (M - X) + NFP = F.[17] Allowing for capital flight (KF), the equation shows that net foreign capital inflows finance the excess of imports over exports, net factor payments (to) abroad and capital flight: F= (M-X) + NFP + KF. From the point of view of analysing the impact of net capital inflows on growth, Thirlwall's model (equations 5.14 - 5.18 above) can be amended. Capital flight, not just net factor payments can be netted out of capital flows.

Equation (5.17) can be re-written as:

$$\mathbf{I = sO + \Delta F - sNFP - sKF} \qquad \textbf{(5.19)}$$

where total net capital inflows (ΔF) have replaced the change in debt (ΔD), total net factor payments (NFP) have replaced interest payments (rD), and sKF represents that proportion of capital flight that would otherwise have been available for investment. Substituting equation (5.19) into equation (5.16) and dividing by output gives:

$$\frac{\Delta O}{O} = \sigma(s + \frac{\Delta F - s(NFP + KF))}{O} \qquad \textbf{(5.20)}$$

[17] Where F includes the change in international reserves.

Equation (5.20) shows that as long as total capital inflows (ΔF) exceed that proportion of net factor payments (including interest and capital flight that would otherwise have been saved), output growth is greater than that obtainable from domestic savings alone. The equation also shows that the positive effect of capital inflows on growth is reduced if capital flight and factor payments other than interest are taken into account. Once again, if total capital inflows finance net factor payments and capital flight, then foreign capital inflows will always have a positive effect on growth (providing $s<1$). It is unlikely, however, that capital flight and net factor payments will be financed by capital inflows for very long.

Net factor payments (NFP) are the sum of interest payments (rD), profit remittances (Pf), worker remittances (wf) and other factor payments (OFP), with inflows being netted out against outflows. If necessary capital flight would have to be net of incoming capital flight, though this would be extremely difficult to measure and perhaps irrelevant in the context of a developing country. Indeed, it is difficult to conceive of inbound capital flight from other countries if outbound capital flight is taking place - unless economic agents in other countries perceive their own countries to be relatively more risky. In testing the model empirically, foreign capital inflows may also be disaggregated in various ways depending on data availability and the components that are deemed to be relevant for the particular analysis. For example, (F) may comprise debt, aid and foreign direct investment (FDI), or a further breakdown might include categories for long and short-term capital.

There are numerous studies of the effects of foreign interest payments and capital flight on various aspects of the economies of developing countries. However, there are few empirical studies of the effect of foreign capital inflows on real growth, that take into account the offsetting effects of net factor payments and capital flight. Various studies (eg Rana and Dowling, 1988), examine the effect of a reduction in savings associated with capital inflows on the growth-inducing impact of foreign capital inflows in developing countries. Where simultaneous equation models are used to test the impact of both capital imports and savings on growth, the effect of capital inflows on growth is usually found to be positive but smaller than would be the case without an offsetting savings effect (Rana and Dowling, 1988; Gupta and Islam, 1983).

The next section examines the empirical evidence on the effect of capital inflows on saving, investment and growth in Jamaica.

5.5 *Capital Inflows, Foreign Debt, Savings, Investment And Growth In Jamaica: The Empirical Evidence*

This section examines the effect of capital inflows on savings, investment and growth in Jamaica. Foreign capital inflows may encourage or discourage savings and as argued in the previous section, the latter effect may occur if capital inflows stimulate domestic consumption sufficiently.

The effect of foreign capital inflows on both the quantity and productivity of investment, is also tested. A positive effect on the quantity of investment may well be offset by a negative effect on the incremental output-capital ratio (IOCR)[18] or alternatively may be reinforced by a positive effect on the (IOCR). Investment is itself an important stimulus to growth, and the indirect effect of capital inflows on growth via their effect on the level and productivity of investment is examined.

The direct impact of foreign capital on real growth is also examined, taking into account the outflow of resources via net factor payments and capital flight. As argued in the previous section, the net transfer of resources must be considered in examining the effect of capital inflows on growth.

Capital inflows are disaggregated by class of recipient into private inflows and government inflows. The former comprises foreign direct investment and other private capital, less private unrequited transfer payments (to) abroad[19] while the latter is composed of government loans and grants. The impact of total capital inflows and its components on savings, investment and growth, is examined.

In addition, the effect of the stock of foreign government debt on savings is tested. Fry (1995) argues that at low initial levels of debt, more debt could have a positive effect on savings (see section 5.4), while a negative effect could occur as the stock of debt grows larger. The effect of debt on investment and growth is also tested. Fry (1995) also argues that foreign

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[18] The (IOCR) = the change in output divided by investment, measures the productivity of investment.

[19] See section 5.5.1 for an explanation of the macroeconomic accounting framework.

indebtedness can be destabilising if it persistently worsens the balance of payments current account or stabilising if it improves the current account. Rising foreign indebtedness may improve the current account thereby slowing down the subsequent buildup of foreign debt, if investment is reduced (raised) by more (less) than savings. Conversely, rising foreign debt is destabilising if savings contract more than investment, or if investment grows faster than savings. The stabilising effect of foreign debt on the current account of Jamaica is tested in this section.

The statistical technique employed is ordinary least squares, and both static and dynamic specifications of various equations are tested. The dynamic versions capture both short-run and long-run information on the different relationships being tested. The data set is for the period 1960-1992, but in most instances the effective period is 1963-1989 because of the lack of data. Only annual time series data are employed. The data are taken from the following sources: International Monetary Fund electronic databank(1960-1990); International Monetary Fund's international financial statistics (1960-1993); World Bank (1976, 1987, 1988/89, 1993); World Bank (1986/87 - 1993/94): United Nations (1960-1981; United Nations (1982-1993); Government of Jamaica (1960-1992). The following subsection lays the foundation for the ensuing empirical investigation by setting out the accounting framework used to measure the various macroeconomic variables. All variables are measured in real terms by deflating them by their appropriate price indexes.

5.5.1 The Macro-Economic Accounting Framework

A standard Macro-economic relationship views the current account surplus of the balance of payments as the difference between national savings and domestic investment:

$$\mathbf{S - I = C A} \qquad \textbf{(5.21)}$$

where S is national saving, I is domestic investment and CA is the balance of payments current account surplus. The current account surplus is itself (identically) equal to the negative of the capital account including the change in reserves:

$$\mathbf{CA \equiv - (KI + \Delta\ Res)} \qquad \textbf{(5.22)}$$

where KI is capital inflows (net of capital outflows), and **ΔRes** equals the net change in reserve assets. A positive sign on **ΔRes** represents a depletion of reserves to finance for example, a current deficit. Capital inflows and the change in reserves may be lumped together as capital and reserve inflows (KRI) which finance the current account. Equation (5.21) and identity (5.22) together show that foreign capital allows investment to take place in excess of domestic savings:

$$\mathbf{S - I = -KRI} \qquad \textbf{(5.23a)}$$

or

$$\mathbf{S + KRI = I} \qquad \textbf{(5.23b)}$$

where KRI represents foreign capital inflows or foreign savings. Equation (5.23b) is the same as equation (5.1).

The current account of the balance of payments may be disaggregated so that identity (5.22) gives:

$$\mathbf{X - M - NFP - KF \equiv -KRI} \qquad \textbf{(5.24a)}$$

or

$$\mathbf{M - X + NFP + KF \equiv KRI} \qquad \textbf{(5.24b)}$$

where X, M, and NFP represent exports of goods and non-factor services, imports of goods and non-factor services , and net factor payments[20] respectively, all in real terms. Public unrequited transfers (or external grants to the government) are included in capital inflows KRI in order to measure their impact on savings, investment and growth (see below)[21]. Capital flight (KF) could have been included on the right-hand side of the identity, but it is preferable to show it as a leakage from the current account. The advantage gained from doing so is that identity (5.24b) can then be interpreted as follows: capital inflows KRI finance the excess of imports over exports of goods and non-factor services, net factor payments, and capital flight.

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[20] Income payments abroad by owners of labour, capital, etc. less income receipts from abroad by the factors of production.

[21] In addition, for present purposes private unrequited transfer payments (to) abroad (PUT) are included in the measurement of KRI but with a negative sign. In the case of Jamaica (PUT) represents a net inflow of private unrequited transfers (ie. A negative outflow), justifying its inclusion in KRI rather than the left-hand side of the identity.

Capital inflows (KRI) are explicitly calculated from the balance of payments accounts, and comprise capital inflows to the government (GKI) and private capital inflows (PKI). Private capital inflows are in turn composed of foreign direct investment (FDI) and other capital flows to the private sector (PKBAL), less private unrequited transfer payments (to) abroad (PUT). Capital inflows to the government comprise borrowing from abroad (GVB) and foreign grants to the government (GGR)[22]. Since KRI, M, X, and NFP are explicitly calculated, and all entries on the balance of payments account are included, capital flight (KF) is the residual. One consequence - and shortcoming - of this approach is that capital flight and net errors and omissions are indistinguishable. In effect the residual is treated as (net) capital flight. This method is similar to that used by the World Bank (1985), and is employed in the absence of reliable data on Jamaica to enable the use of a more direct approach to the estimation of capital flight (see Dooley (1988), Cuddington (1986and section 5.4.2).

Identity (5.24) gives rise to three other definitions used in subsequent sections. They provide a measure of the net transfer of resources in the extended version of Thirlwall's (1994) model presented in section 5.4.2:

$$\mathbf{KF \equiv KRI + X - M - NFP} \qquad \textbf{(5.25)}$$

$$\mathbf{NTR \equiv KRI - NFP \equiv M - X + KF} \qquad \textbf{(5.26)}$$

$$\mathbf{NTRK \equiv KRI - NFP - KF \equiv M - X} \qquad \textbf{(5.27)}$$

where (NTR) represents the net transfer of resources without counting capital flight (KF), and (NTRK) is the net transfer of resources with capital flight.

The next three sub-sections (5.5.2, 5.5.3 and 5.5.4) test the effect of capital inflows on savings, investment and growth respectively, making use of the definitions developed in this

[22] The absence of more detailed information for the period of the study prevented further disaggregation into long-term and short-term capital inflows. Some assumptions could have been made based on the nature of the inflow - eg. FDI may have been assumed to be long-term capital. In general, however, such an approach seemed unreliable without more detailed information.

sub-section. The models in the sub-section on capital inflows and growth (5.5.4) are tested using the extended Thirlwall (1994) model of section 5.4.2.

5.5.2 Capital Inflows, Foreign Debt and Savings

Equation (5.23b)

$$S + KRI = I \tag{5.28}$$

shows that foreign capital KRI may finance investment in excess of national savings. However, if some foreign capital is used to finance consumption and encourages domestic consumption at the expense of savings, then S could decline. Indeed, if capital inflows are not fully utilised for investment then S in (5.28) above must decline. According to Weisskopf (1972), the decline in savings is an approximate measure of the extent to which foreign capital is being consumed.

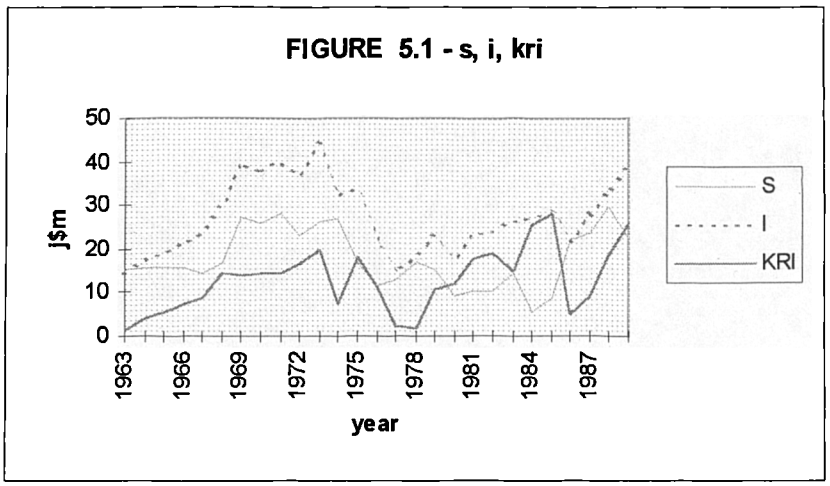

Figure 5.1 shows the levels of saving, investment and capital inflows (KRI) over the three decades of our study. Savings fell consistently short of investment over the entire period, with the gap being financed by capital inflows. The issue to be examined is whether or not capital inflows themselves had a negative, positive, or neutral impact on savings and therefore influenced the magnitude of the savings gap (S - I). In the light of the theoretical literature reviewed, a negative relationship would be expected if some proportion of foreign capital were

consumed, while a positive relationship would imply that the confidence of domestic savers was buoyed by foreign capital inflows (a kind of demonstration effect).

The equations summarised in table (5.1) test the effect of real capital inflows (KRI) and the ratio of the stock of real external government and government guaranteed debt to gdp (DXY) on saving(S). Following the Keynesian proposition, real gross domestic product (GDPR) is expected to be an important determinant of savings as it was in Chapter Three, and is included as an explanatory variable. The real bilateral exchange rate between Jamaica dollars and US dollars[23] (ER) is also included as an explanatory variable on the grounds that exchange rate changes may well have had an important bearing on business confidence and saving decisions. A rise in the real exchange rate might stimulate savings by improving the current account or alternatively by lowering domestic prices relative to foreign prices. On the other hand a rising real exchange rate caused by persistent devaluations might lead to savings apathy, and have a negative effect on S. The real interest rate (r) is included to test its effect on savings[24]. Estimation is by Ordinary Least Squares and the regression results of equation {1} from Table 5.1 are as follows with the t - statistics in brackets below the coefficients:

$$\underset{\quad}{\mathbf{S = -11.34 + 0.21\ (GDPR) - 0.09\ (KRI) - 19.84\ (DXY) + 0.08\ (R) + 2.99\ (ER)}}$$
$$\mathbf{(-1.32)\quad (3.27)\qquad (-0.59)\qquad (-4.93)\qquad (0.53)\qquad (2.32)}$$

$$\mathbf{R2 = 0.71,}\qquad \mathbf{\bar{R}^2 = 0.64,}\qquad \mathbf{D.W. = 1.61,}\qquad \mathbf{F_{(5,21)} = 10.08}$$

$$\mathbf{SE = 4.11,}\qquad \mathbf{n = 27} \qquad\qquad \mathbf{(5.29)}$$

The Durbin-Watson statistic lies in the indeterminate region, but other diagnostic tests (χ^2 and F tests) point to the absence of serial correlation. In addition, the criteria for

TABLE 5.1

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[23] Measured as J$ per US$, multiplied by the US price index divided by the Jamaica price index.

[24] Saving(S) is defined as Investment(I) minus capital inflows KRI from equations (5.23a). Alternatively, S = I + CA from equation (5.21), where CA is the current account surplus.

Savings Models : S, DS

	{1} - S			{2} - S			{3} - S			{4} - S			{5} - DS		
Vbls.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.
CONST	-11.3	-1.32	0.202	-10.8	-1.43	0.170	-28.5	-2.94	0.010	-8.94	-1.12	0.276	-6.24	-0.71	0.489
GDPR	0.21	3.27	0.004	0.25	4.26	0.000	0.26	5.18	0.000	0.19	3.07	0.006			
KRI	-0.09	-0.59	0.562												
GKI				-0.37	-1.90	0.073									
GVB							0.14	0.44	0.669						
GGR							-3.64	-2.90	0.010						
PKI				0.09	0.62	0.545									
FDI							0.10	0.61	0.549						
PUT							-0.65	-2.30	0.035						
PKBAL							-0.33	-1.64	0.121						
RESCH				-0.50	-1.39	0.180	-0.17	-0.50	0.624						
DXY	-19.8	-4.93	0.000	-11.4	-2.18	0.042	-23.0	-2.87	0.011	-20.9	-5.44	0.000			
R	0.08	0.53	0.601	0.11	0.85	0.405	0.18	1.40	0.180	0.08	0.52	0.606			
ER	2.99	2.32	0.031	1.08	0.82	0.425	6.19	2.26	0.038	2.76	2.20	0.039			
NTRK										0.003	0.02	0.987			
S (t - 1)													-0.95	-3.20	0.006
DGDPR													0.58	2.16	0.048
GDPR(t-1)													0.19	1.94	0.073
DKRI															
KRI (t-1)															
DGKI													-0.17	-0.74	0.470
GKI (t-1)													-0.33	-0.65	0.526
DPKI													0.11	0.46	0.655
PKI (t-1)													0.24	1.11	0.285
DXYC													-2.89	-0.28	0.787
DXY (t-1)													-1.15	-0.08	0.940
RG													0.12	1.06	0.308
ERG													-0.05	-0.49	0.630
R		0.71			0.79			0.88			0.7			0.69	
R		0.64			0.72			0.81			0.63			0.44	
D.W.		1.61			2.15			2.36			1.71			2.33	
F	(5,21)	10.08		(7,19)	10.51		(10,16	11.89		(5,21)	9.85		(11,14	2.81	
S.E.		4.11			3.61			2.99			4.14			4.04	
n		27			27			27			27			26	
ser.corr	chi-sq	[1]	0.73	chi-sq	[1]	0.24	chi-sq	[1]	1.13	chi-sq	[1]	0.22	chi-sq	[1]	3.03
func.fm.	chi-sq	[1]	0.30	chi-sq	[1]	2.83	chi-sq	[1]	3.31	chi-sq	[1]	0.69	chi-sq	[1]	0.3
normal.	chi-sq	[2]	0.76	chi-sq	[2]	0.81	chi-sq	[2]	1.74	chi-sq	[2]	0.58	chi-sq	[2]	1.56
heteros.	chi-sq	[1]	2.00	chi-sq	[1]	0.02	chi-sq	[1]	3.09	chi-sq	[1]	2.45	chi-sq	[1]	0.77
chow	chi-sq	[4]	7.26	chi-sq	[4]	3.00	chi-sq	[4]	4.21	chi-sq	[4]	6.76	chi-sq	[4]	6.03

functional form, normality and heteroscedasticity are satisfied. The parameters are found to be stable using Chow's stability test, and the equation in general is well determined.

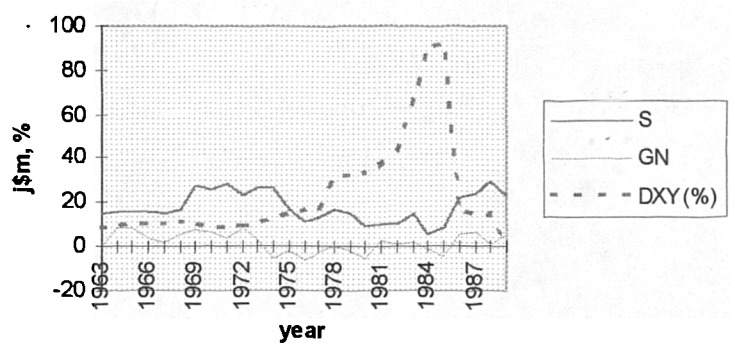
Real output (GDPR) has the expected positive sign and is significant at the 5 per cent level. The results suggest that on average, a J$1 million increase in real GDP leads to an increase in savings of J$210,000. The Keynesian savings function in which savings are strongly influenced by real output, is supported.

Foreign capital inflows have no statistically significant effect on savings. There is no evidence that foreign capital inflows financed consumption to any significant degree over the period. A preliminary conclusion is that foreign savings financed the excess of investment over national savings depicted in Figure 5.1.

Fry (1995) argues that if a positive relationship between foreign debt and savings exists, it may be because, in keeping with the modern Ricardian Equivalence hypothesis (Fry 1995), higher government debt might raise savings if households expect higher government expenditure and taxation in the future to pay for the increased debt. The private sector would increase its savings in order to be in a better position to meet the higher taxation in the future. Additionally, the current level of government saving would not be reduced by its future contingent liability. Fry's suggestion that at low levels of foreign debt, increases in the debt may encourage savings, does not seem to hold for Jamaica over the sample period. However, the ratio of the stock of external government debt to GDP (DXY) does seem to have a strong negative impact on savings in Jamaica. Equation (5.29) was estimated for different sub-periods, particularly for periods covering the 1960s and the first half of the 1970s when debt was relataively low. A positive relationship between debt and savings was never found. There was generally a negative but insignificant relationship between foreign debt and savings for the early years of the 1960s and early 1970s.

However, there does seem to be a significant negative impact of foreign debt on savings

FIGURE 5.2 - s, dxy, gn(=gdprg)



overall, particularly during the second half of the 1970s and the 1980s. As Figure 5.2 indicates, foreign government debt grew slowly between 1963 and 1973, more rapidly between 1973 and 1977, and sharply between 1977 and 1985. The huge escalation in debt between 1977 and 1985 is associated with IMF and World Bank borrowing (see Chapter One). Severe demand management policies instituted by a new political regime resulted in a fall in foreign debt after 1985.

Higher debt levels affect domestic confidence adversely and may result in capital flight (e.g. via the over and under invoicing of imports and exports respectively). As savings are measured as the sum of investment and the current account surplus, capital flight may reduce measured (if not actual) savings. Table 5.2 shows that the rapid increases in foreign debt[25] between 1975 and 1985 are associated with a decline in savings. Savings improved significantly after 1985 as external debt was reduced.

The insignificance of the real domestic interest rate (r) as a determinant of savings supports the findings of Chapter Three. The real bi-lateral exchange rate (ER) exerts a significant and positive influence on savings. A rise in (ER) represents a depreciation of the exchange rate which ceteris paribus raises the price of imports relative to exports. Depending on the relative elasticities of demand for imports and exports, a depreciation can improve or worsen the current account. Import and export elasticities are examined in Chapter Six, but for present purposes it would seem that exchange rate depreciation stimulated savings, while

[25] Both as a ratio of GDP and in absolute terms.

		S	I	(X-M)	DX	DXY(%)	E	ER
	1963	15.1429	14.2857	0.8572	7.1935	7.9785	0.7143	3.2835
	1964	15.8823	17.7941	-1.9118	8.4494	9.0662	0.7143	3.255
	1965	15.6302	18.9706	-3.3404	10.0154	10.22	0.7143	3.2248
	1966	15.8248	21.4084	-5.5836	10.8321	10.362	0.7143	3.2635
	1967	14.5137	23.6	-9.0863	11.5125	10.523	0.7242	3.2967
	1968	16.6672	29.4872	-12.82	12.2053	10.732	0.8333	3.7331
	1969	27.4815	39.6591	-12.1776	12.9205	9.9799	0.8333	3.7048
	1970	25.9197	38.0412	-12.1215	11.7273	8.813	0.8333	3.4184
	1971	28.2023	40.3922	-12.1899	11.8662	8.5803	0.8328	3.3779
	1972	23.0362	37.1698	-14.1336	13.0604	8.8673	0.7675	3.0559
	1973	26.5926	44.065	-17.4724	15.4174	10.308	0.9091	3.2649
	1974	26.7428	32.2086	-5.4658	18.6252	12.612	0.9091	2.8479
	1975	16.7244	33.6683	-16.9439	22.2436	14.675	0.9091	2.6489
	1976	11.4503	22.3182	-10.8679	23.5669	16.432	0.9091	2.5526
	1977	12.8818	14.6559	-1.7741	23.136	16.375	0.9091	2.4431
	1978	16.9437	18.0707	-1.127	41.9243	31.614	1.4133	3.0296
	1979	15.1965	22.6446	-7.4481	37.7385	32.068	1.7648	3.2655
	1980	9.2678	17.7336	-8.4658	34.3294	33.409	1.7814	2.9377
	1981	10.3959	23.2112	-12.8153	37.088	36.599	1.7814	2.8743
	1982	10.0815	24.2095	-14.128	45.4185	43.189	1.7814	2.8642
	1983	14.4915	26.3729	-11.8814	75.1879	66.941	1.9322	2.8738
	1984	5.5629	27.1518	-21.5889	105.7874	89.95	3.9428	4.7867
	1985	8.7704	28.37	-19.5996	104.044	92.872	5.5586	5.5586
	1986	22.1441	21.9064	0.2377	19.3285	16.008	5.4778	4.8492
	1987	23.518	27.9879	-4.4699	20.6403	15.237	5.4867	4.7242
	1988	29.7511	32.7308	-2.9797	20.3363	13.907	5.4886	4.5384
	1989	22.6163	38.4983	-15.882	.	.	5.7446	4.3549

currency appreciation had the opposite effect. This may have been associated with the possible impetus given to exports and discouragement of imports when the exchange rate depreciated (especially over the period 1984-1989 compared to the 1974-1983 period), and the discouragement of net exports during the years when the rate was over-valued[26] (see Table 5.2).

In equation {2} of table (5.1), capital inflows are disaggregated into private capital inflows (PKI) and inflows to the government sector (GKI).[27] Equation {2} passes all the diagnostic tests as shown on Table (5.1), including that for parameter stability, and it is well-determined with an adjusted R^2 of 0.64. Once again, neither component affects savings significantly, (GDPR) has a strong positive impact on savings, and the external debt ratio (DXY) has a significant negative impact. Equation {3} further disaggregates private capital inflows (PKI) into foreign direct investment (FDI), private unrequited transfers (PUT), and a miscellaneous category for "other" private capital (PKBAL). Capital inflows to the government are broken down into government borrowing (GVB) and receipts of grants (GGR). The resulting estimation is as follows:

$$\begin{aligned} S = &- 28.5 + 0.26\ GDPR + 0.14\ GVB - 3.64\ GGR \\ &(-2.94) \quad (5.18) \quad (0.44) \quad (-2.90) \\ &+ 0.10\ FDI + - 0.65\ PUT - 0.33\ PKBAL - 0.17\ RESCH \\ &(0.61) \quad (-2.30) \quad (-1.64) \quad (-0.50) \\ &-23.0\ DXY + 0.18\ R + 619\ ER \\ &(-2.87) \quad (1.40) \quad (2.26) \end{aligned} \tag{5.30}$$

where the components of private foreign capital (PKI) and public foreign capital (GKI) are as described above, while the other variables are as defined earlier. Just as total foreign capital inflows (KRI), private capital inflows (PKI) and public sector capital inflows (GKI) have no significant effect on domestic savings, the components of (PKI) and GKI) that give rise to quid-pro-quos also have no significant effect. However, grants to the government (GGR) and grants

[26] Generally 1974-1983. The 1963-73 period was one of relative exchange rate stability while the 1984-1989 period saw a relative decline in the real exchange rate.

[27] In addition the variable RESCH represents capital "inflows" from the depletion of the country's foreign reserves.

to the private sector (PUT) both seem to have statistically significant negative effects on domestic savings.

The magnitude of grants to the government of Jamaica tends to be small and not necessarily tied to capital projects. There is therefore greater flexibility in their use, and in practice such resources often end up being consumed rather than invested. In the case of private unrequited transfers from abroad they are by their very nature as gifts (of capital), liable to be used substantially for consumption purposes rather than invested. It is not surprising that both public sector (GGR) and private sector (PUT) grants are partially consumed and have a statistically significant negative effect on savings. It may also be the case that both public and private grants lower the domestic savings effort in a way that foreign borrowing does not, since the latter has to be repaid. As with equation {1} of Table (5.1), the real exchange rate (ER) has a significant positive effect on domestic savings, while the real interest rate (r) has no significant effect on savings (this is consistent with the finding of Chapter Three). The external debt/GDP ratio continues to have a significant negative effect on savings, although the magnitude of the effect in all the savings equations seems implausibly high.

The dynamic equation {5} in table (5.1), attempts to isolate the short and long-run factors affecting savings. The change in savings (DS) is regressed on savings in the previous period and on both the changes in (PKI) and (GKI) as well as (PKI) and GKI) lagged one period. The short-run changes in savings (DS) are not significantly affected by short or long-run capital inflows (private or government), or by external debt. However, short-run changes in real output (DGDPR) have a positive effect on short-run changes in savings (DS). The significance of the explanatory variable $S_{(t-1)}$ suggests that 95 per cent of the adjustment to long-run equilibrium takes place within one year.

In general, apart from external grants to the public and private sectors, foreign capital inflows are invested rather than consumed in Jamaica and have no significant effect on savings. However, high external government debt seems to be a strong deterrent to saving, perhaps because it affects private sector confidence. The policy implication is that the government should keep its debt under control if saving is not to be discouraged. Further, foreign savings should be encouraged as they do not affect national savings adversely, but debt creating foreign savings should be discouraged. Other forms such as foreign direct investment (FDI) do not

lead to debt accumulation and the possibility of future negative effects of high debt on savings (including the loss of savings through future debt repayments). In addition, the strong relationship between real gdp and saving implies that the main impetus to savings lies in raising real output and income. However, the real issue for economic growth is investment and the extent to which savings (both domestic and foreign) are invested productively. It is to the impact of foreign savings on investment that we now turn.

5.5.3 Capital Inflows, Foreign Debt and Investment.

This sub-section examines the effect of aggregated and disaggregated foreign capital inflows and external government debt on the level of domestic investment in Jamaica. The analysis of the previous two sub-sections would seem to suggest that a positive relationship between foreign capital inflows and investment can be expected. There was no evidence to suggest that foreign savings on the whole financed consumption. However, given the finding of section 5.5.2 that foreign savings received by the government in the form of grants partially financed consumption, a weak link between investment and grants can be expected.

In addition, this sub-section analyses the empirical evidence on the effect of external debt on investment and the effect of capital inflows and external debt on the productivity of investment in Jamaica. The literature reviewed in sections 5.2 and 5.3 suggests that the answers to these questions are essentially empirical in nature. However, they may have far reaching implications for economic policy and for economic performance. Finally, this sub-section examines in the context of the empirical evidence on Jamaica, Fry's (1995) argument that external debt may have a destabilising effect by worsening the balance of payments current account.

Estimation is by Ordinary Least Squares on time series data. Table (5.3) summarises the results of four investment models in which investment (IR) or the change in investment (DI) are the dependent variables.

Investment Models : I, DI, IOCR

	{6} - IR			{7} - IR			{8} - IR			{9} - DI			{10} - IOCR		
Vbls.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.
CONST.	11.91	1.72	0.103	13.24	2.12	0.052	-2.65	-0.19	0.854	11.11	3.05	0.009	-0.03	-1.24	0.228
GDPRLA	0.61	2.66	0.016	0.35	1.43	0.173	0.31	0.90	0.383						
KRI	0.85	5.07	0.000										-0.01	-1.36	0.188
NTRK															
GKI				0.48	2.18	0.045									
GVB							1.14	1.95	0.073						
GGR							-1.16	-0.46	0.652						
PKI				1.19	5.70	0.000									
FDI							1.23	4.08	0.001						
PUT							-0.54	-1.07	0.303						
PKBAL							0.93	3.05	0.009						
RESCH				0.85	1.94	0.072	1.03	1.94	0.075						
DXY	-24.1	-3.78	0.001	-18.5	-2.90	0.011	-30.1	-2.17	0.049				0.08	1.56	0.135
CREDR	0.09	1.17	0.257	0.15	2.04	0.059	0.15	1.68	0.116						
R	-0.22	-1.17	0.257	-0.19	-1.13	0.276	0.06	0.26	0.801						
ER	1.12	0.73	0.477	-0.43	-0.27	0.792	4.98	1.05	0.312						
PSURP	0.20	1.49	0.153	0.34	2.57	0.021							-0.01	-1.50	0.150
GDPRG													0.04	17.18	0.000
I (t - 1)										-0.59	-3.73	0.002			
DGDPRLA										0.34	1.45	0.169			
GDPRLA(t-1)										0.22	0.72	0.485			
DKRIY															
KRI (t-1)															
DGKI										0.55	3.40	0.004			
GKI (t-1)										0.39	1.01	0.328			
DPKI										0.55	3.05	0.009			
PKI (t-1)										0.65	2.41	0.030			
DXYC										-5.95	-0.82	0.425			
DXY (t-1)										-7.65	-0.78	0.451			
P (t - 1)															
R		0.77			0.84			0.83			0.78			0.95	
R		0.68			0.74			0.68			0.64			0.94	
D.W.		1.31			2.30			1.79			2.38			1.68	
F	(7,17)	8.19		(9,15)	8.79		(11,13	5.71		(9,14)	5.62		(4,21)	94.1	
S.E.		4.61			4.10			4.57			3.43			0.05	
n		25			25			25			24			26	
ser.corr	chi-sq	[1]	2.83	chi-sq	[1]	1.15	chi-sq	[1]	0.42	chi-sq	[1]	2.51	chi-sq	[1]	0.78
func.fm.	chi-sq	[1]	0.01	chi-sq	[1]	1.26	chi-sq	[1]	2.99	chi-sq	[1]	1.10	chi-sq	[1]	2.60
normal.	chi-sq	[2]	0.97	chi-sq	[2]	1.04	chi-sq	[2]	1.18	chi-sq	[2]	0.41	chi-sq	[2]	2.48
heterosc.	chi-sq	[1]	0.27	chi-sq	[1]	0.61	chi-sq	[1]	1.61	chi-sq	[1]	0.61	chi-sq	[1]	2.57
chow	chi-sq	[4]	6.78	chi-sq	[4]	3.79	chi-sq	[4]	1.87	chi-sq	[4]	2.77	chi-sq	[4]	0.33

Equation {6} of Table 5.3 is presented below with the t-statistics below the coefficients of the variables:

$$\underset{\quad}{\mathbf{IR = 11.91 + 0.61\ (GDPRLA) + 0.85\ (KRI) - 24.08\ (DXY)}}$$
$$\mathbf{\quad\quad\quad

constrained in its ability to do so by having to meet heavy debt repayments. Equation {7} of Table (5.3) is summarised as follows:

$$\begin{aligned} IR = {} & 13.24 + 0.35\,(GDPRLA) + 0.48\,(GKI) + 1.19\,(PKI) \\ & (2.12)\ (1.43) \qquad\qquad (2.18) \qquad (5.70) \\ & + 0.85\,(RESCH) - 18.5\,(DXY) + 0.15\,(CREDR) - 0.19\,(r) \\ & (1.94) \qquad\qquad (-2.90) \qquad (2.04) \qquad (-1.13) \\ & -0.43\,(ER) + 0.34\,(PSURP) \\ & (0.27) \qquad (2.57) \end{aligned} \tag{5.32}$$

where the variables are as defined earlier. Equation {8} of Table (5.3) is summarised as follows:

$$\begin{aligned} I = {} & -2.65 + 0.31\,(GDPRLA) + 1.14\,(GVB) + 1.16\,(GGR) \\ & (-0.19) \quad (0.90) \qquad (1.95) \qquad (-0.46) \\ & + 1.23\,(FDI) - 0.54\,(PUT) + 0.93\,(PKBAL) + 1.03\,(RESCH) \\ & (4.08) \qquad (-1.07) \qquad (3.05) \qquad (1.94) \\ & -30.1\,(DXY) + 0.15\,(CREDR) + 0.06\,(R) + 4.98\,(ER) \\ & (-2.17) \qquad (1.68) \qquad (0.26) \quad (1.05) \end{aligned} \tag{5.33}$$

where the variables are as before. Equations (5.32) and (5.33) provide increasingly disaggregted measures of capital inflows and their effect on domestic investment in Jamaica. Foreign capital inflows are disaggregated into public sector inflows (GKI) and private sector inflows (PKI) in equation (5.32). In equation (5.33) the variable (GKI) is further disaggregated into government borrowing (GVB) and government grants (GGR), while (PKI) is broken down into foreign direct investment (FDI), foreign grants to the private sector (PUT) and other private capital inflows (PKBAL). Both equations (5.32) and (5.33) satisfy the criteria for parameter stability, normality, functional form, and the absence of serial correlation and heteroscedasticity. The equations have fairly high adjusted R^2's and are well determined, as is

equation {9} of Table (5.3) which shows the short-run change in investment (DI) and their determinants.

Aggregate capital inflows (KRI) in equation (5.31) as well as foreign savings going to both the private and government sectors separately (PKI and GKI respectively in equation (5.32)) are positive and significant in explaining domestic investment. The effect of private capital inflows (PKI) is particularly strong, and equation (5.32) shows that it is foreign direct investment (FDI) and capital received by the banks, financial sector and other miscellaneous sectors (PKBAL) that are the significant factors. Although foreign capital inflows to the public sector (GKI) are significant deterimants of investment (equation 5.32), its components (GVB and GGR) are not separately significant in equation (5.33) (possibly because they offset one another in the more disaggregated equation (5.33)). As expected, private unrequited transfers (PUT) and financing out of reserves (RESCH) are not significant determinants of investment[30]. In addition, the dynamic equation {9} of Table 5.3 shows that both short-run changes in private capital inflows (DPKI) and long-run inflows (PKI_{t-1}) are significant in stimulating short-run changes in investment (DI). Short-run changes in government inflows (DGKI) - probably government borrowing rather than grants - are also significant in determining short-run changes in investment (DI), but long-run government inflows (GKI_{t-1}) are not.

The policy implications of the above results are that the government should give incentives to foreign capital, particularly foreign direct investment (FDI) if it wishes to stimulate investment. Foreign direct investment provides external resources in partnership with domestic resources and has the additional advantage of not building up debt directly. One factor that has to be taken into account though, is the possibility of the future repatriation of profits from successful ventures, which represent an outflow of capital. However, this is not a disadvantage, for if the venture is unprofitable then the outflows will be minimal or non-existent and if it is profitable then economic activity would have been generated anyway.

In addition, the findings above suggest that judicious borrowing and utilisation of capital by the government stimulates investment, provided that the build up of debt is

[30] This is consistent with the result in section 5.5.2 that private unrequited transfers are partially consumed. Indeed, it is argued in that sub-section that they are likely to be mainly consumed rather than invested. Reserves are generally used purely as a financing item for the BOP and not as a source of funds for investment.

manageable and does not outweigh the positive effects of borrowing. Most government borrowing is project related and is used to build up the economic and social infrastructure. However, adequate debt management is essential if the positive effects are not to be negated.

Fry's (1995) argument that external debt can be destabilising in the sense of a deteriorating balance of payments current account that has no inherent self-correcting mechanism, can now be examined. From equation (5.21),

$$\mathbf{S - I = CA}$$

where CA is the current account surplus of the balance of payments. Fry (1995) argues that the current account will deteriorate and become unstable if the external debt to GDP ratio (DXY) lowers saving more than it lowers investment or increases investment by more than it increases saving. Our finding for Jamaica from equations {1}, {2}, {3} and {4} of Table 5.1 is that (DXY) has a significant negative effect on savings. In addition, equations {6}, {7} and {8} of Table 5.3 show that (DXY) reduces investment significantly. Examining the coefficients on (DXY) in the comparable equations for investment and savings,[31] consistently shows that the external debt/gdp ratio (DXY) lowers investment by more than it lowers savings. Consequently, external debt is *not* inherently destabilising for Jamaica as far as the balance of payments account is concerned. Although it would seem that higher debt by itself does not generate a persistent deterioration in the balance of payments, it may be inimical to growth via its negative effect on investment. This will be examined in the next sub-section.

In addition to the positive effect of foreign capital inflows on investment, its impact on the productivity of investment needs to be considered. Returning for a moment to the Harrod-Domar growth equation (equation 5.3) of section (5.2)

$$\mathbf{g = \sigma (s + sf),}$$

[31] Capital inflows appear in an increasingly disaggregated form in successive equations for both savings and investment. Equation {1} on savings is comparable with equation {6} on investment, both of which use aggregate capital inflows (KRI), {2} is comparable with {7} in which KRI has been disaggregated into (GKI) and (PKI), and {3} is comparable with {8}.

a decline in the incremental output/capital ratio (σ), or equivalently a fall in the productivity of investment will have an adverse effect on growth (g), ceteris paribus. Equation {10} of table 5.3 shows the effect of foreign capital inflows (KRI) and the externaol debt ratio (DXY) on the productivity of investment (IOCR)[32] in Jamaica. In addition, Leibenstein's[33] contention that economic growth itself may raise productivity (see Chapter Three), is again tested by the inclusion of the real growth rate (gdprg) as an explanatory variable.

Both foreign capital inflows (KRI) and the foreign debt ratio (DXY) have no significant effect on the productivity of investment. On the other hand, the real growth rate (gdprg) has a highly significant positive effect on investment productivity, again supporting Leibenstein's[33] view and our findings in Chapter Three. Financial variables, whether domestic or foreign, do not seem to have any significant effect on the productivity of investment in Jamaica, while the rate of economic growth has a positive and significant effect as analysed in Chapter Three.

5.5.4 Capital Inflows, Capital Outflows, Foreign Debt and Economic Growth

Capital inflows allow domestic investment to take place in excess of national savings. The evidence on Jamaica suggests that a positive association exists between foreign capital inflows and investment, which might in turn be expected to stimulate economic growth. However, the ultimate effect of foreign capital on growth depends on three additional effects that it might have. Firstly, on its effect on savings. In the case of Jamaica capital inflows were found in Section 5.5.2 to have no significant effect on savings, which does not point to any significant effect on growth via savings.

Secondly, if foreign capital inflows are more than offset by capital outflows (net factor payments abroad, and capital flight), then (net) capital inflows might have a negative effect on growth, as predicted by equation (5.20). It is therefore necessary to take into account both the inflows and outflows of capital (ie. the net transfer of resources, NTRK) when considering the effect of foreign capital on the real growth rate.

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[32] IOCR is the incremental output - capital ratio.

[33] Op. Cit.

Thirdly, the effect of capital inflows and outflows on the productivity of investment (σ) must be taken into account. The Harrod-Domar model used as a point of departure in the discussion on the Dual-Gap model in this chapter, assumes that (σ) is constant. However, Griffin[34] argues that significant amounts of foreign capital are used by governments for infrastructural projects which are often substantial or on "politically" motivated projects, both of which tend to have low investment productivities. The implication is that the average productivity of investment for the economy as a whole is lowered.

This section examines the effect of the net transfer of resources (NTRK) on real economic growth in Jamaica, taking into account the inflow of capital (KRI) and the outflow of resources made up of net factor payments abroad (NFP) and capital flight (KF). The impact of foreign debt on growth is also tested.

Re-arranging equation (5.25) gives the balance of payments equation:

$$\mathbf{X - M - NFP - KF + KRI = 0} \qquad \textbf{(5.34)}$$

Re-arranging (5.34) gives the expression for the net transfer of resources taking into account (NFP) and (KF). The net transfer of resources with capital flight (equation 5.27) is also equal to (and finances) the current account deficit (M - X):

$$\mathbf{NTRK = KRI - NFP - KF = M - X.}$$

The effect of (NTRK) on real growth can now be considered in the context of the extended Thirlwall model (equation 5.20) developed in section 5.4.2:

$$\frac{\Delta O}{O} = \sigma\left[s + \frac{KRI - s(NFTP + KF)}{O} \right]$$

where $\frac{\Delta O}{O}$ represents the real growth rate. Letting gn stand for $\frac{\Delta O}{O}$, the actual rate of growth gn which takes account of NTRK, will be greater than the Harrod growth rate $g = \sigma s$ if:

[34] Op. Cit.

	Z	W	G	GN	GK	GNG	GKG	I-S	PRODI
						GN - G	GK - G		
1963	0.58275	0.87645	.	.	.	.	.	-0.8572	.
1964	3.7361	0.38163	6.9664	8.4658	8.7726	1.4993	1.8062	1.9118	37.9929
1965	4.7117	0.71913	6.0887	7.9796	8.2042	1.8909	2.1155	3.3404	36.4341
1966	5.3632	2.0514	2.882	4.057	4.2323	1.1751	1.3503	5.5836	17.7244
1967	6.9538	1.9973	1.244	2.0646	2.0113	0.8206	0.76725	9.0863	8.5144
1968	12.6943	1.8778	3.1157	5.8338	5.8397	2.7181	2.724	12.82	19.6522
1969	12.2166	1.6843	4.7363	7.3365	7.132	2.6002	2.3958	12.1776	19.4475
1970	13.0379	1.3945	4.4479	6.9839	6.9246	2.536	2.4766	12.1215	20.7162
1971	13.1667	1.2276	2.758	4.1125	4.1657	1.3545	1.4077	12.1899	12.2912
1972	14.9812	1.7227	4.5965	8.0107	7.9295	3.4142	3.333	14.1336	27.0876
1973	18.3624	1.6747	1.7619	3.0074	3.0895	1.2455	1.3276	17.4724	9.2652
1974	6.6034	0.7531	-4.6284	-5.28	-5.9015	-0.65163	-1.2732	5.4658	-22.9237
1975	16.4518	1.5292	-0.66528	-1.3216	-1.3805	-0.65631	-0.71526	16.9439	-5.1992
1976	10.6025	0.34798	-3.2939	-6.033	-6.4441	-2.739	-3.1502	10.8679	-35.3313
1977	1.3876	0.94219	-2.1858	-2.4264	-2.5811	-0.24067	-0.39532	1.7741	-20.3338
1978	0.6659	1.1519	0.55108	0.59121	0.61021	0.04013	0.05912	1.127	3.9207
1979	8.9033	1.948	-1.295	-1.8931	-2.2197	-0.59816	-0.92469	7.4481	-10.0779
1980	9.6112	2.2551	-3.1613	-5.704	-7.2089	-2.5427	-4.0476	8.4658	-38.0396
1981	16.1333	1.4158	1.1185	2.5613	3.0066	1.4428	1.8881	12.8153	12.3057
1982	17.553	1.3101	0.56516	1.3758	1.6226	0.81067	1.0574	14.128	6.4999
1983	13.7201	1.2627	1.1946	2.2224	2.4297	1.0278	1.2351	11.8814	9.7706
1984	21.7838	3.7826	-0.1937	-0.93659	-1.0839	-0.74289	-0.89024	21.5889	-4.0885
1985	24.6018	3.5136	-1.4861	-4.5865	-6.2499	-3.1005	-4.7639	19.5996	-18.9824
1986	2.7416	2.2233	5.349	5.5873	6.5483	0.23822	1.1993	-0.2377	28.5734
1987	6.9494	2.3846	5.0084	6.3381	6.9962	1.3297	1.9878	4.4699	26.7876
1988	15.5857	3.0834	1.0681	1.189	1.7383	0.12094	0.67022	2.9797	4.5694
1989	23.0513	2.7299	3.0999	5.5707	6.6336	2.4708	3.5337	15.882	18.4177
Average	11.1908	1.71263							

$$\mathbf{KRI > s(NFTP + KF)} \qquad \mathbf{(5.35)}$$

that is, if capital inflows exceed that proportion of outflows that would otherwise have been saved, and if the productivity of investment is not reduced. Capital inflows have already been found to have no significant effect on savings or on investment productivity in Jamaica over the period. If condition (5.35) is met (ceteris paribus), actual growth (gn) can be expected to exceed the growth rate consistent with domestic savings alone(g). In addition, under those circumstances, gn would be expected to be lower than the growth rate (gk) given by capital inflows without taking account of capital outflows, that is, gk > gn > g.

On the other hand, given the productivity of investment and no effect on (s),if s(NFP + KF) > KRI, then g can be expected to exceed gn and gk to exceed g: gk > g> gn. The precise outcome is an empirical issue for the particular country concerned, to which we now turn.

Considering first of all the Harrod growth model ($g = \sigma s$), the propensity to save (s) out of GDP is obtained from the regression equation {1} in Table 5.1. Holding the influence of other variables constant, s = 0.21. Also, the productivity of investment (σ) from equation 3.36 of Chapter 3, was found to be 0.09. The average growth rate (g) without capital flows, is therefore 1.89 per cent. The growth rate (g) can now be compared with the actual average growth rate gn. The difference (Z) between KRI and [s(NFTP + KF)] is positive (see Table 5.4), and section 5.5.2 found that capital inflows have a positive and significant effect on investment, which in turn can be expected to be positively related to growth. The actual average growth rate (gn) turns out to be 2.12, which is higher than the growth rate (g) associated with domestic savings alone. The positive net inward transfer of resources has a positive effect on real growth. Another way of testing this is demonstrated below.

Positive net inflows [Z = KRI - s(NFP + KF)] can be expected to have a positive effect on the difference between the actual growth rate and the Harrod growth rate (gn - g). These relationships are tested in the following equation:

$$\mathbf{gng = 0.39 + 0.06(Z) + 0.06(PRODI) - 1.86(DXY) - 0.03(PSURP)}$$

(0.96) (2.09) (6.46) (-2.13) (-1.03) (5.37)

R^2 = 0.81; $\bar{R}^2$ = 0.78; D.W. = 1.45; $F_{(4,21)}$ = 22.70; n = 26

Serial Correlation $\chi^2(1) = 1.86$

Functional Form, $\chi^2(1) = 0.60$

Normality $\chi^2(2) = 1.94$

Heteroscedasticity $\chi^2(1) = 0.38$

Chow Test $\chi^2(4) = 5.30$

where gng = gn - g, (Z) represents capital inflows net/of/outflows and PRODI is the incremental output-capital ratio in percentage terms. Net transfers (Z) have a positive and significant effect on the difference between actual growth (including capital flows) and growth financed by domestic savings alone. As expected, the foreign debt ratio has a negative effect on the growth rate differential.

The effect of the productivity of investment on the growth rate differential is also tested directly and found to have a significant positive impact. The higher the productivity of investment, the higher the growth attributable to the net inflow of resources. However, Granger Causality tests carried out on the relationship between investment productivity and the growth rate differential, indicate that there is a strong two-way relationship. The growth rate attributable to foreign capital influences investment productivity in a positive way, and vice-versa.

In order to calculate the growth rate (gk) consistent with capital inflows (KRI) without the adjustment for outflows, the foreign savings ratio to GDP (sk) is obtained by regressing capital inflows (KRI) on real GDP (GDPR):

$$KRI = -20.88 + 0.26\,(GDPR) - 0.46\,(PSURP) - 12.82\,DU77 \quad (5.38)$$
$$(-2.25)\quad (3.71)\qquad (-2.38)\qquad (-2.19)$$

$R^2 = 0.47$; $\bar{R}^2 = 0.40$; D.W. = 1.60;

SE = 5.72 $F_{(3,23)} = 6.73$; n = 27

Serial Correlation	$\chi^2(1) = 0.45$
Functional Form,	$\chi^2(1) = 0.30$
Normality	$\chi^2(2) = 1.60$
Heteroscedasticity	$\chi^2(1) = 0.51$
Chow Test	$\chi^2(4) = 7.96$

where (DU77) is a dummy variable representing the jolt given to investor confidence caused by the abandonment in 1977, of the first IMF loan to Jamaica negotiated the same year. The other variables are as before and the equation is well determined. The ratio of foreign savings to real GDP is 0.26, the coefficient on (GDPR). Growth with domestic and foreign savings alone can be expressed as:

$$gk = \sigma(s + sk) \quad (5.39)$$

where the foreign savings to GDP ratio (sk) is 0.26. The growth rate (gk) works out to be 4.2 per cent, which does not take into account the loss of growth from the outflow of resources, s(NFTP +KF).

The main results of this sub-section are that the net inflow of foreign resources has a significant positive effect on real growth (but no significant effect on productivity), and that the outflow of resources (including capital flight) has a negative effect on growth. In addition, the accumulation of foreign debt has an adverse effect on growth, due perhaps to its effect on investor confidence. Also, there seems to be a positive two-way relationship between foreign capital induced growth and investment productivity.

5.6 *Summary and Conclusions*

This chapter analysed the effect of foreign capital and the stock of foreign debt on domestic savings, investment and growth in Jamaica. According to the literature surveyed in the early part of the chapter, if capital inflows are partly consumed they will have a negative impact on domestic saving. However, if they are wholly invested they will have a positive impact on savings. In addition, the stock of debt could have a positive effect on savings at lower levels of debt and a negative effect at higher levels. Also, rising foreign indebtedness could have a stabilising effect on the balance of payments by improving the current account, if investment is reduced (raised) by more (less) than saving. On the other hand, foreign debt might be destabilising if savings decline more than investment or investment grows faster than saving.

Our findings for Jamaica indicate that foreign capital inflows have no significant effect on saving. Similarly, the main components of capital inflows to the public sector (government borrowing, GVB) and the private sector (foreign direct investment FDI, and private borrowing PKBAL) have no significant effect on saving. This implies that foreign capital inflows are used by and large for investment not consumption purposes, as supported by the strong positive relationship between capital inflows and investment when tested directly. The policy implication is that the Authorities should encourage capital inflows with appropriate policies if higher investment is a macroeconomic goal. In particular, special attention should be given to foreign direct investment and private borrowing which were found to have strongly positive effects on investment.

The stock of outstanding foreign debt is found to have a significant negative effect on saving, investment and growth, although its impact on the balance of payments is not found to be destabilising. The government would be well advised to generate public sector savings for capital programmes and to lower its stock of foreign debt.

Although capital inflows were found to have a significant positive effect on the quantity of investment, they were found not to have any significant effect on the productivity of investment. The productivity of investment in Jamaica seems to be determined by real variables - in particular the real growth rate - and not by financial variables. Net foreign inflows of resources were found to have a significant positive impact on growth, while the outflow of resources were found to have a negative

effect. In addition, high foreign debt seems to be inimical to growth. Capital outflows in Jamaica include savings which might otherwise be invested and possibly the loss/flight of human capital, with some of the most productive leaving first (but this was not tested). While capital inflows stimulated growth, capital outflows (including capital flight) had an adverse effect on growth. A more favourable and stable social and political domestic climate and a more hospitable economic environment, would have to be maintained to attract foreign capital and discourage capital flight, in order that higher and sustained economic growth might be achieved.

CHAPTER 6

ECONOMIC GROWTH AND THE BALANCE OF PAYMENTS CONSTRAINT

6.1 Introduction

The balance of payments has important implications for real economic growth for three main reasons.[1] Firstly, a prolonged deterioration in the current account resulting from excessive imports relative to exports, will have an adverse effect on domestic employment and output. For example, if domestic activity is reduced by import penetration, growth can be adversely affected.

Secondly, in the long run real growth cannot exceed that rate consistent with balance of payments equilibrium on current account. Thirdly, although growing deficits can be financed by high interest rates in the short run, high interest rates discourage investment on which growth ultimately depends.[1] Therefore in the long run prolonged deficits can only be inimical to growth.

This chapter examines the extent to which real economic growth in Jamaica was constrained by the balance of payments during the 1960-1992 period. There are two basic approaches in the economic literature to the question of what determines real growth and why growth rates differ among countries. The first is the supply - oriented and Neoclassical approach. In the supply side theories, output and the growth of output are determined by resource endowment and the productivity of factors of production. Output is essentially supply determined, and allocative and producer efficiency along with flexible prices ensure the efficient utilisation of resources at full employment.

The supply oriented approach is based on the aggregate production function, which in turn is taken from, and is assumed to be of the same form as, the individual production functions for goods and for industries at the micro level. Severe doubts have been expressed about the validity of assuming that aggregate production functions are necessarily of the same

[1] Mc.Combie and Thirlwall (1994).

form as the individual functions from which they are assumed to be derived (Blaug p. 470 1985).

Nevertheless, whether or not these models assume one or more sectors, they all argue that growth can be attributed to some combination of: (1) increases in the use of the factors of production (land, labour, capital); (2) increases in the productivity of individual factors and (3) improvements in total factor productivity (as a result of, for example, increasing returns to scale, the transfer of factors between sectors and technical progress). The sources of growth are then determined by calculating (1) and obtaining the contribution of total factor productivity as a residual. In effect, the measurement of total factor productivity seems to be a "measure of our ignorance" of the sources of growth in the Neoclassical approach.

The second basic approach to the determination of real growth, the demand oriented approach, rejects both the underlying Neoclassical assumptions described above and the validity of the aggregate production function. The aggregate production function is not simply the sum of the micro production functions of the economy, nor is it valid to separate out the contribution of the various factors of production to growth. "Explaining" real economic growth in terms of the growth of the factors of production and productivity does not shed light on why they have grown in the first place. The demand oriented approach is Keynesian in spirit and explains growth in terms of the growth of demand, to which supply, within limits, adapts. Real economic growth is determined by demand and in particular by the relaxation or tightening of constraints on demand. The major constraint on demand in an open economy is likely to be the balance of payments. The economy of Jamaica is highly open, with imports and exports each being around seventy per cent of GDP in 1992 (see Chapter 1).

This chapter examines Thirlwall's (1979) and Thirlwall and Hussain's (1982) balance of payments constrained growth model and its applicability to Jamaica over the period 1961-1992. Section 6.2 describes the balance of payments constrained growth model and empirical tests of the model. Section 6.3 provides a critique of the model by various authors, while section 6.4 tests the model empirically for Jamaica. Finally, section 6.5 summarises the main conclusions of the chapter.

6.2 *The Balance of Payments Constraint on Growth*

6.2.1 *The Basic Model and the Extended Model*

Thirlwall's (1979) model of balance-of-payments constrained growth is a demand-oriented one that seeks to explain real growth in terms of the extent of the constraints placed upon it by the balance of payments. Balance of payments difficulties can become a constraint on demand which could in turn have an adverse effect on growth, which may then worsen the balance of payments in a vicious circle. McCombie and Thirlwall (1994, p. 233) write:

> "If a country gets into balance-of-payments difficulties as it expands demand before the short-term capacity growth is reached, then demand must be curtailed; supply is never fully utilised; investment is discouraged; technological progress is slowed down, and a country's goods compared with foreign goods become less desirable so worsening the balance of payments still further, and so on. A vicious circle is started. By contrast, if a country is able to expand demand up to the level of existing productive capacity, without balance-of-payments difficulties arising, the pressure of demand upon capacity may well raise the capacity growth rate."

If demand can be expanded up to existing productive capacity without getting into balance of payments difficulties, the pressure of demand may stimulate growth. This may occur through various mechanisms: investment may be stimulated, the capital stock increased, and technological progress brought about; factors of production may move from low to high productivity sectors; people outside the work force (at home or abroad) may be drawn into it, thereby expanding labour supply, and domestic resources may be made more productive by imports.

Thirlwall's[2] hypothesis is that a country's long run growth rate is determined by the ratio of its rate of growth of exports to its income elasticity of demand for imports, if balance of payments equilibrium is to be maintained. In other words, the real growth rate cannot exceed in the long run, that rate that is consistent with balance of payments equilibrium on

[2] Op. Cit.

current account. According to the model, the actual growth rate will approximate the balance-of-payments constrained growth rate predicted by the model, given certain assumptions. The derivation of the model now follows [see Thirlwall (1979), Thirlwall and Hussain (1982) and McCombie & Thirlwall (1994)].

Balance of payments equilibrium on current account measured in units of domestic currency, may be written as:

$$\mathbf{P_dX = P_fME} \qquad \textbf{(6.1)}$$

where X and M are the quantities of exports and imports respectively, P_d is the average price of exports in domestic currency, P_f is the average price of imports in foreign currency, and E is the nominal exchange rate (ie. the domestic price of foreign currency). The left and right hand sides of the expression measure the values of total exports and imports respectively, both in domestic currency.

The condition for balance-of-payments equilibrium for an economy growing through time is that the rates of growth in the values of exports and imports are equal:

$$\mathbf{p_d + x = p_f + m + e} \qquad \textbf{(6.2)}$$

where the lower-case letters represent continuous rates of change of the variables. Returning to equation 6.1, the volume of exports (X) demanded may be expressed as a multiplicative function of: the price of exports (P_d) relative to the foreign price of goods competitive with exports measured in the domestic currency (P_fE), and the level of world income (Z):

$$X = b\left(\frac{P\mathrm{d}}{P\mathrm{f}\,\mathrm{E}}\right)^{n} Z^{\varepsilon} \qquad \textbf{(6.3)}$$

where b is a constant, η is the price elasticity of demand for exports, and ε is the income elasticity of demand for exports. In addition the following conditions apply: ($\eta<0$) and ($\varepsilon>0$). The rate of growth of exports is then:

$$x = \eta\ (p_d - p_f - e) + \varepsilon z \tag{6.4}$$

$$M = a\left(\frac{P_f E}{P_d}\right)^{\psi} Y^{\pi} \tag{6.5}$$

Similarly, the volume of imports demanded in equation (6.1) may be expressed as a multiplicative function of: the ratio of the price of imports measured in domestic currency (P_fE) to the price of import substitutes (P_d), and domestic income Y:
where a is a constant, ψ is the price elasticity of demand for imports, and π is the income elasticity of demand for imports. The following conditions are assumed: ($\psi<0$) and ($\pi>0$). The rate of growth of imports is:

$$m = \psi\ (p_f + e - P_d) + \pi y \tag{6.6}$$

Substituting equations (6.4) and (6.6) into (6.2) and solving for the rate of growth of domestic income gives:

$$y_B = \frac{(1 + \eta + \psi)(p_d - p_f - e) + \varepsilon z}{\pi} \tag{6.7}$$

where y_B is the rate of growth of domestic income consistent with balance of payments equilibrium. The prediction of the model is that y_B will approximate the actual growth rate y (i.e. $y = y_B$) in the long run.

The calculation of y_B from equation (6.7) requires the estimation of parameters and the collection of substantial amounts of data that might not be readily available, particularly for

developing countries. If relative prices are assumed to be stable in the long run, equation (6.7) becomes:

$$y_B = \frac{\varepsilon z}{\pi} = \frac{x}{\pi} \qquad (6.8)$$

that is, the balance of payments equilibrium growth rate y_B is equal to the rate of growth of the volume of exports divided by the income elasticity of demand for imports. The growth rule implied by the model is that in the long run the actual growth rate will approximate to x/π. Thirlwall (1982) demonstrates that this dynamic result corresponds to the Harrod foreign trade multiplier which Harrod (1933) had asserted was a major determinant of industrial growth, while at the same time being a mechanism for maintaining balance of payments equilibrium.

The simple model was extended by Thirlwall and Hussain (1982) to incorporate capital flows. The inclusion of capital flows reflects the more realistic situation where the current account is not in balance and has to be offset by capital flows. This is particularly true of developing countries, which can sometimes sustain current account deficits for quite a long time by having them financed by capital inflows (and debt write-offs). If the current account is initially in disequilibrium, the balance of payments equation may be written as:

$$\mathbf{P_dX + F = P_fME} \qquad (6.9)$$

where F measures nominal capital inflows (if F>0) or outflows (if F<0). The other symbols are the same as before. The rates of change give:

$$\theta(p_d + x) + (1-\theta)f = p_f + m + e \qquad (6.10)$$

where θ and $(1-\theta)$ are the shares of exports and capital flows as a proportion of total receipts respectively.[3] Substituting equations (6.4) and (6.6) into equation (6.10) gives the balance-of-payments constrained growth rate starting from an initial position of disequilibrium:

[3] $\theta = P_dX/R$ and $(1-\theta) = F/R$ where R = total receipts from abroad = P_dX+F. In effect θ and $(1-\theta)$ represent the respective proportions of the import bill financed by export earnings and capital flows.

$$y_B = \frac{(\theta\eta + \psi)(p_d - e - p_f) + (p_d - e - p_f) + \theta\varepsilon z + (1-\theta)(f - p_d)}{\pi} \quad (6.11)$$

There are several implications of both the simple model without capital flows and the extended model embodying capital flows that offset current account disequilibria.[4] We return for a moment to the simple model of equation (6.7), which assumes balance of payments equilibrium and which does not assume that relative prices are fixed (as does equation (6.8))

$$y_B = \frac{(1 + \eta + \psi)(p_d - p_f - e) + \varepsilon z}{\pi} \quad (6.12)$$

As before, the signs of the parameters are: ($\eta<0$), ($\psi<0$), ($\varepsilon>0$) and ($\pi>0$). Equation (6.12) implies that:

(1) domestic relative to foreign inflation (p_d-p_f) will lower the rate of growth required to maintain balance of payments equilibrium if the absolute value of the sum of the price elasticities of demand for exports and imports exceeds unity: $|\eta+\psi|>1$.

(2) If the absolute value of the sum of the price elasticities of demand for exports and imports exceeds unity, a sustained currency depreciation (i.e. e>0, since e measures the home price of foreign currency), will improve the growth rate consistent with balance-of-payments equilibrium. This is the Marshall-Lerner condition.

(3) Increases in world income (z), will improve the balance-of-payments equilibrium growth rate y_B. The extent of the improvement depends on the income elasticity of demand for exports (ε).

(4) The higher the income elasticity of demand for imports (π), the lower the growth rate consistent with balance-of-payments equilibrium.

The disequilibrium model incorporates capital flows and is summarised in equation (6.11) above:

[4] McCombie & Thirlwall (1994).

$$y_B = \frac{(\theta\eta + \psi)(p_d - e - p_f) + (p_d - e - p_f) + \theta\varepsilon z + (1-\theta)(f - p_d)}{\pi}$$

Relative price changes affect balance-of-payments constrained growth via their effect on the volume of imports and exports given the price elasticities (the first term on the right hand side of equation 6.11 above), and also directly (the second term on the right). The effect of changes in the growth of world income and the rate of growth of capital flows are embodied in the third and fourth terms respectively. Assuming stable relative prices in the long run, equation (6.11) becomes:

$$y^*_B = \frac{\theta\varepsilon z + (1-\theta)(f - p_d)}{\pi} \qquad \textbf{(6.13)}$$

Starting from an initial disequilibrium on the current account, the balance-of-payments constrained growth rate is determined by the effect of exogenous income growth abroad on export growth (the first term in 6.13), and the growth of real capital flows (the second term), all divided by the income elasticity of demand for imports. The terms in the numerator are weighted by their respective shares of total receipts [(θ) and (1-θ)]. Given the absence of information on εz for all countries, Thirlwall and Hussain[5] assume that $\varepsilon z = x$. In so doing, they incorporate "into the analysis from the start any volume changes in exports from relative price movements" (Thirlwall and Hussain, 1982, p.503). Equation (6.13) becomes:

$$y^*_B = \frac{\theta x + (1-\theta)(f - p_d)}{\pi} \qquad \textbf{(6.14)}$$

The difference between the growth rate predicted by equation (6.14) and the actual growth rate, will reflect the influence of the pure terms of trade effect on real growth and their effect via the growth in import volumes. The extended model which incorporates current account balance of payments disequilibrium and makes allowance for capital flows, is

[5]Op. Cit.

consistent with the simple equilibrium model. With an initial equilibrium and no capital flows, $\theta=1$ and $(1-\theta)=0$, equation (6.14) reduces to:

$$y_B = \frac{x}{\pi} \tag{6.15}$$

which is the same as equation (6.8) of the simple model.

Starting with current account disequilibrium (ie. deficit) but with zero growth in nominal capital inflows, real income growth must decline to lower import growth below the rate of export growth, if the deficit is not to worsen in absolute terms. The lower growth rate will be:

$$y_B^{**} = \frac{\theta x-(1-\theta)(p_d)}{\pi} \tag{6.16}$$

and the reduction in the growth rate will be

$$y_B - y_B^{**} = \frac{(1-\theta)(p_d + x)}{\pi} \tag{6.17}$$

If the growth rate of capital flows to finance an initial deficit is positive, the required growth of capital inflows that would keep real income growth from falling below its level without initial disequilibrium, can be obtained by setting equation (6.14) equal to (6.17) and solving for the growth of capital flows (f). This gives:

$$f = p_d + x \tag{6.18}$$

That is, the required rate of growth of capital flows is equal to the rate of growth of export earnings (or equivalently, it is equal to the rate of growth of the current account deficit). If there is an initial balance-of-payments disequilibrium, the above results taken together imply that the simple Harrod rule for predicting the growth rate, $y_B = x/\pi$, will under-predict if the growth of capital inflows exceeds the growth rate of export earnings. On the other hand, the

Harrod rule will over-predict if the growth rate of capital inflows is less than the rate of growth of export earnings. The extent of under-prediction on over-prediction is obtained by subtracting equation (6.14) from equation (6.8):

$$y_B - y_B^{**} = \frac{(1-\theta)(p_d + x - f)}{\pi} \qquad (6.19)$$

The Balance of Payments Constrained Growth Model is a long-run growth model. According to the model, in the long run countries can only grow faster than that rate which maintains equilibrium on the current account of the balance of payments, if they are accumulating deficits. In such a case the deficit would have to be financed by capital inflows. On the other hand, in the long run economies can only grow more slowly than the balance of payments equilibrium growth rate if they are accumulating surpluses (or exporting capital). The model is not meant to be applied to the short or medium term.

6.2.2 Empirical Evidence on the Basic and Extended Models.

Four basic tests of the Balance of Payments Constrained Growth model have been suggested in the economic literature (see McCombie and Thirlwall 1997, and McCombie and Thirlwall 1994). The first is a rank correlation test across countries, between the growth rate predicted by the simple model and actual growth. Thirlwall's (1979) study of 18 advanced countries for the period 1953-1976 and 12 advanced countries for the period 1951-1973, finds high values for the Spearman rank correlation coefficient of 0.764 and 0.891[6] for the respective data sets. However, the rank correlation coefficient has been criticised by McGregor and Swales (1989) as not showing how closely the model predicts actual growth. They consider the use of a non-parametric test by Thirlwall to be a significant weakness.

A second test which does not measure how closely the model predicts actual growth, is to take the average deviation in absolute terms, of actual growth from the predicted growth rate. The average deviation is typically less than one percentage point in most of the studies including Bairam and Dempster's (1991) study of 11 Asian countries between 1961 and 1985,[7] and Atesoglu's (1993) study of the USA in which the average deviation over 21 years is 0.38

[6] The coefficient is typically over 0.7 in most studies.
[7] Seven of the 11 countries had average deviations less than one percentage point.

percentage points.[8] However, although the second test is superior to the first, it still suffers from the disadvantage of not being a parametric test.

A third test which is parametric, is to regress the actual growth rate on the balance of payments constrained rate to determine whether the regression coefficient is significantly different from unity. If it is not, then the model will be a good prediction of the actual growth rate. However, this test has three shortcomings. Firstly, if an incomplete sample of countries is taken in which deficits and surpluses do not cancel out, then the results may be biased.[9] It is on these grounds that McCombie (1989) criticises this test performed by McGregor and Swales (1989) on Thirlwall's (1979) data. Using (OLS) regression analysis, McGregor and Swales[10] find that the coefficients are significantly different from untiy and erroneously reject the model.

The second shortcoming of the test is that serious outliers[11] may produce a regression coefficient substantially different from unity and wrongly lead to a rejection of the model for countries as a whole. The third shortcoming is that the elasticity of demand for imports (π) which is used in the model and is estimated from an import demand function with domestic income and relative prices as explanatory variables, has a related standard error. McCombie and Thirlwall (1997) point out that it would be better to regress the predicted growth rate on the actual growth rate instead of the other way around, but that this would not deal effectively with the first two shortcomings.

A fourth test which does not suffer from any of the above objections is to estimate for each country separately, the income elasticity of demand for imports (π^*) that would make predicted growth (g_b) equal to actual growth (g). If this extimate (π^*) does not differ significantly from the estimated income elasticity of demand for imports (π) obtained from the time series regression for the country, then (gb) and (g) will not be significantly different from one another. The Dynamic Harrod Trade Multiplier is supported in most of the studies that make use of this test.

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[8] See below for more detail on Atesoglu's study.
[9] i.e. predicted growth might systematically exceed actual growth or vice versa, simply because of the imbalance between deficits and surpluses across the sample of countries.
[10] Op. Cit.
[11] e.g. that of Japan for which balance of payments constrained growth has significantly exceeded actual growth since the war.

Thirlwall and Hussain (1982) test the extended model on a number of developing countries for varying periods between 1951 and 1978. In general, Thirlwall and Hussain[12] find that the extended model incorporating capital flows predicts actual growth better than the simple model. The mean absolute error of the actual growth rate from the rate predicted by the extended model is 1.55 percentage points compared to 2.01 percentage points for the simple model.

On average, the real terms of trade seemed to have constrained real growth by about 0.6 per cent per annum, while capital inflows seemed on average to have enabled the countries to grow 0.05 per cent faster than the rate predicted by the simple model. The authors conclude that the results indicate that the model's growth predictions approximate the growth experience of the countries studied, and therefore provide a useful starting point for analysing their growth performance.

Bairam (1988) tests the simple model on a sample of 19 developed countries for the period 1970-85, and on 15 developing countries for various periods between 1961 and 1985 (Bairam, 1990). Bairam (1988) finds that the predicted growth rate $y^* = x/\pi$ approximates the actual growth rate y. However, when $y^* = \varepsilon z/\pi$ is used, the model over-predicts actual growth because of the unreliability of estimates of ε (the income elasticity of demand for exports).

Bairam (1990) finds that the simple model accurately predicts the growth rates of nine out of the fifteen countries in the study[13] ($y = x$ seems to perform slightly better than $y^* = \varepsilon z/\pi$). Four of the remaining six countries are oil exporters and Bairam (op. cit.) finds that the model does not predict the growth rates of those countries accurately probably because those economies are not demand constrained, but rather are supply constrained by internal labour and capital bottlenecks. Bairam and Dempster (1991) also find emphatic support for the dynamic Harrod growth rule in their study of 11 Asian countries for various periods between 1961 and 1985. In addition, they find that relative price changes are insignificant for growth but that differences in income elasticities might be important in explaining the different growth rates of the countries in the study.

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[12] Op. cit.

[13] Bairam uses the maximum likelihood technique and the Cochrane-Orcutt procedure to correct for autocorrelation.

Atesoglu (1993) uses two-stage least squares to test the simple model on the United States for overlapping 16 year periods between 1955 and 1970, and again between 1975 and 1990. The model gives a fairly accurate prediction of growth over the period, with the average predicted rate being 3.10 per cent compared to the actual average of 3.37 per cent. It is interesting that the model "works" for the USA, which is not normally considered to be a highly open economy. Given the accuracy of the simple model, Atesoglu concludes that not only do relative price changes seem to play an unimportant role in determining balance-of-payments performance, but that it is real output rather than relative prices that adjusts to disequilibrium in the balance of payments. Atesoglu tests the extended model on Canada for the period 1961-91 and finds that capital flows are unimportant. The dynamic Harrod trade multiplier is valid overall, although relative price changes seem to be significant for the 1977-91 sub-period, with export growth being significant over the 1961-76 sub-period.

6.3 Critiques of the Balance of Payments Constrained Growth Models.

The balance-of-payments constrained growth model has been criticised on theoretical grounds by McGregor and Swales (1985, 1986, 1991), Crafts (1988, 1990) and Krugman (1989). McGregor and Swales[14] are critical of the model in several respects. Firstly, they argue that the import and export functions are too aggregative and do not incorporate non-price competitive factors. International trade is determined not just by relative prices and income, but also by non-price factors such as product characteristics, consumer demand for variety, economies of scale, etc. Their point is, in their own words, that non-price competition "does not appear in the demand function, nor anywhere else in the analysis" (1985, p.20, emphasis added). Thirlwall (1986) and McCombie (1989) correctly argue that, although non-price competitive factors are not explicitly included in the import and export functions, they are implicit in the income elasticities of demand for exports and imports. Differences in income elasticities of demand between countries capture differences in the nature and characteristics of the goods produced and exported by the various countries. The model is, indeed, highly aggregative, but this in itself does not invalidate its conclusions or its usefulness (or otherwise) as an approximate measure or predictor of economic growth.

[14] Op. Cit.

Secondly, McGregor and Swales[15] are critical of the assumption that relative prices are fixed in the long run. In particular, they contend that Thirlwall invokes the classical "law of one price" to support the assumption of sticky prices. If the "law of one price" holds, then, they claim, the demand functions become perfectly elastic and the model cannot then be interpreted as a demand-constrained model of economic growth. Economic growth could only be supply-constrained in a world that obeys the law of one price.

If the model in general and the stability of relative prices in particular depend on the assumption of the law of one price, then the model would indeed be incompatible with the notion of constrained demand (McCombie, 1989). However, the long-run stability of relative prices in no way depends on the law of one price. Thirlwall (1986) admits that his use of the term "law of one price" was unfortunate, as it was used in a loose sense to refer to sticky relative prices engendered by oligopolistic or even highly competitive markets. In addition, the tendency of domestic price changes to mirror exchange rate changes in many countries, help to make relative prices (measured in a common currency) sticky. As Thirlwall (1979) points out, several studies (eg Wilson, 1976, Ball 1977) suggest that long-run relative prices measured in a common currency are stable. Ultimately this is an empirical question for any particular country or group of countries.

The third major criticism of the model by McGregor and Swales[16] is that the equation for balance-of-payments constrained growth (equation 6.8) above: $y = x/\pi$) can be derived from an open economy neoclassical model. Such a model would assume that the "law of one price" holds, with the implication that growth is supply-constrained rather than demand-constrained. In such a model prices, not income, adjust to changing market conditions, and export growth is endogenous to supply conditions and does not depend on world income or the income elasticity of demand for exports. The direction of causation in equation (6.8) is reversed: $x = y\pi$.

This is not simply a question of manipulating the equation (6.8). Reversing the direction of causation represents a fundamental change in one's view of how the macro-economy works. The neoclassical assumptions embodied in $x = y\pi$ are basically at odds with

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[15] Op. Cit.

[16] Op. Cit.

the Keynesian approach of the balance-of-payments constrained growth model. It seems more reasonable to suppose that export growth is exogenously determined and that demand conditions (particularly foreign demand in an open economy) have a decisive impact on real domestic growth. This does not mean that supply conditions including the availability of factors, are unimportant in the growth process. On the contrary, the characteristics of goods themselves determine the income elasticities of demand for traded and non-traded goods, but this is not the same as the neoclassical production function approach to growth. The Keynesian view that the growth of supply responds to demand is more plausible in explaining why it is that the factors of production grow in the first place.

Krugman (1989) finds that the real growth of a country is indeed directly related to the income elasticity of demand for its exports, and inversely related to the income elasticity of demand for its imports. This finding is, in effect, Thirlwall's[17] balance-of-payments constrained (equilibrium) model. However, Krugman contends that it is growth that determines the elasticities and not the other way around. He explicitly rejects the notion of demand constraining growth via the balance-of-payments, arguing instead that faster growth stimulates exports thereby raising the "apparent" income elasticity of demand for exports relative to that for imports. Krugman's[18] model is one in which factor supplies and total factor productivity determine growth, which in turn determines the apparent export and import elasticities. The problem is that this is not an explanation of growth, the trade elasticities or the balance of payments. Higher growth accompanied by growing exports will automatically raise the income elasticity of demand for exports (ceteris paribus). However, this in no way explains why a country that grows faster necessarily exports more, or what causes the growth of factors of production (which Krugman contends is the driving force of growth), to occur in the first place.

Crafts (1988, 1990) uses Balassa's (1979) approach to argue that it is incorrect to use the actual income elasticity of demand for exports to determine whether or not a country (in particular the UK between 1951 and 1973) is balance of payments constrained. He argues that the correct elasticity to use is the one that would have maintained a constant share for the UK in world trade. On that basis, equilibrium growth would have been nearly three times (at 7.1 per cent) the actual rate of growth (2.7 per cent). He concludes that UK growth is not balance-

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[17] Op. Cit.

[18] Op. Cit.

of-payments constrained. As McCombie and Thirlwall (1994) argue, Crafts is inconsistent in that he uses the constant-market-share approach to calculate the export elasticity, but not the import elasticity, for which he relies on conventional estimates. More importantly, Craft's approach only implies that if the UK was able to maintain its world market share, exports would have grown faster and economic growth would have been higher. This has nothing to do with whether or not the UK was in fact balance of payments constrained - or indeed supply constrained - over the period. The fact is that the UK's market share was not maintained (for whatever reason), and that the extent of non-price competitiveness or lack of it is reflected in the actual elasticities. The UK is where it is because of actual conditions (of constrained demand!).

The balance of payments equilibrium condition expressed in equation (6.1) or (6.9), reflects all the credits (embodied in P_dX) and debits (embodied in P_fME) that comprise the entire current account.

$$\mathbf{P_dX = P_fME}$$

or

$$\mathbf{P_dX + F = P_fME}$$

In principle, exports are composed of goods, services, factor income and transfers, while imports comprise goods, services, factor payments and transfers.[19] In practice, on account of the difficulty of obtaining estimates of price indices (and thereby calculating quantities), for all but the goods items, exports and imports generally include only goods.

Consequently, any difference between the actual growth rate and the rate predicted by the simple model (x/π or $\varepsilon z/\pi$), will be a measure not only of the effects of changes in relative prices and the growth in capital flows, but also of the effect of omitting a subset of the current account.[20] In countries where exports or imports of services, factor payments or transfers are significant, the prediction "error" of the model could be larger. Using the entire current account would imply that any difference between actual and predicted growth would be attributable only to the effect of relative price changes and capital growth for the simple model.

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[19] For present purposes capital flight can be included in capital flows instead of imports (see the discussion in Chapter 4).

[20] In other words the demand functions for all items may differ from those using a subset of the current account for which explicit price indexes are available.

Similarly; for the extended model represented by equations (6.13) and (6.14), any difference between actual and predicted growth will be a measure not only of changes in relative prices, but also of the effect of omitting the current account variables.

However, in practice the use of all the current account variables may still not result in a more accurate prediction of the growth rate. In practice real current account credits and debits might be obtained by deflating nominal values by some general price index such as the implicit gdp deflator or the consumer price index. The quantities thereby obtained would be approximations, as would the associated income elasticities. Whether or not the inaccuracies inherent in attempting to employ all the current account variables outweigh the benefit from including them is an empirical question. There is no guaranteed payoff in terms of improved predictive power.

6.4 *Economic Growth and the Balance of Payments Constraint in Jamaica: The Empirical Evidence.*

6.4.1 Introduction

This section examines the empirical evidence on balance of payments constrained growth in Jamaica. The fundamental question to be answered is whether or not Thirlwall's[21] proposition that the Harrod trade multiplier accurately predicts the long-run growth rate, holds for Jamaica. Both versions of the basic model ($y_B = x/\pi$ and $y_B = \varepsilon z/\pi$) are tested, while two versions of the disequilibrium model (incorporating capital flows) are examined. The different versions are compared to determine which one gives the closest prediction of the actual growth rate.

In addition, several other issues are examined as follows:

(i) The importance of pure terms of trade effects.

(ii) The importance of overall relative price changes to economc growth. The work of Thirlwall[22] and others reviewed in section 6.2.2 suggests that the role of relative price changes in determining the growth rate of many countries is minimal;[23]

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[21] Op. Cit.

[22] Op. Cit.

(iii) The importance of relative price movements other than pure terms of trade effects. In particular, the effect of relative price movements on import volumes working through the price elasticity of demand for imports. The significance of elasticity changes for growth is considered.

(iv) The question of whether in the context of the model, economic growth is driven by export growth or by external capital growth in Jamaica.

(v) Whether or not using the entire current account of the balance of payments gives a better prediction of growth than using merchandise imports and exports.

(vi) With regard to the accuracy of the various versions of the model in predicting actual growth, an attempt is made to answer the question "how close is close" by using appropriate statistical tests.

(vii) The "true" balance of payments constrained growth rate is obtained by estimating the rate of growth in the absence of capital flows,[24] that would have prevented further deterioration (improvement) in the initial current account deficit (surplus). This "true" growth rate which Hussain (1995) refers to as the "counter factual" growth rate, is calculated for Jamaica.

6.4.2 The Import and Export Functions.

Appendix 6.A.1 summarises the data needed to test the simple and extended models for the period 1961-92, using both export growth (x) and the growth of world demand (εz). Following the approach of nearly all researchers in the field,[25] the model is first estimated using real merchandise imports and exports. The model is then estimated using the entire current account. The relevant equations[26] for the simple model are:

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[23] Not only does the empirical evidence reviewed in Section 6.2.2 suggest that the role of relative prices changes is small, but it is argued by Thirlwall that relative prices are stable in the long run on a-priori grounds (see Section 6.2.1). Even if they are not stable, their effects may be insignificant if the price elasticities are low.

[24] This differs from the simple model in that the simple model assumes that relative prices are constant, whereas the "true" growth rate incorporates relative price movements.

[25] Hussain (1995) is an exception in that he uses imports and exports of goods and services. Merchandise trade is generally used given that import price indices are readily available and can be used to obtain real imports.

[26] See Section 5.2.1.

$$y_B = \frac{x}{\pi} \qquad \textbf{(6.8a)}$$

and

$$y_B = \frac{\varepsilon z}{\pi} \qquad \textbf{(6.8b)}$$

where x, ε, and z are the rate of growth of real exports,[27] the income elasticity of demand for exports and the rate of growth of real world income respectively. The equations of the extended model starting from balance of payments disequilibrium are, respectively, (6.14) and (6.13) above:

$$y^*_B = \frac{\theta x + (1-\theta)(f-p_d)}{\pi}$$

and

$$y^*_B = \frac{\theta \varepsilon z + (1-\theta)(f-p_d)}{\pi}$$

where θ and (1-θ) are the shares of exports and capital flows respectively, in total receipts.[28] The term (f-pd) represents real capital flows[29] [inflows if (f-pd)>0 and outflows if (f-pd)<0].

[27] Real exports are nominal exports deflated by the export price index.

[28] See Section 6.2.1.

[29] Real capital flows are the negative of the current account deficit of the balance of payments deflated by the consumer price index.

Import and Export functions - merchandise trade basis

	{1} - logM			{2} - logM			{3} - logM			{4} - logX			{5} - logX		
Vbls.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.			
CONST.	-2.04	-3.46	0.002	-1.92	-3.67	0.001	-1.80	-2.83	0.009	-0.26	-0.32	0.753	-0.27	-0.33	0.743
logY	1.24	10.20	0.000	1.21	11.1	0.000	1.07	5.08	0.000						
logTTM				-0.15	-5.54	0.000	-0.13	-3.71	0.001						
logZ										0.31	2.24	0.033	0.31	2.26	0.032
logTTX													0.02	0.36	0.722
DU77	-0.34	-3.17	0.004	-0.34	-3.26	0.003	-0.34	-3.22	0.003						
DU83										-0.34	-2.27	0.032	-0.34	-2.28	0.031
$logM_{(t-1)}$							0.15	1.03	0.313						
$logTTM_{(t-}$	-0.17	-5.24	0.000												
$logX_{(t-1)}$										0.43	2.79	0.010	0.43	2.79	0.010
$logTTX_{(t-1)}$										0.02	0.38	0.705			
R-sqrd		0.90			0.91			0.90			0.70			0.70	
R bar-sqd		0.89			0.90			0.89			0.65			0.65	
D.W.		1.90			1.92										
Durbin-h								-0.39 , 0.70			1.24			2.46	
F	(3,28)	81.46 , 0.00		(3,29)	95.44 , 0.00		(4,27)	64.15 , 0.00		(4,27)	15.6 , 0.00		(4,27)	15.5 , 0.00	
S.E.		0.103			0.10			0.1			0.14			0.14	
n		32			33			32			32			32	
ser.corr	chi-sq	[1]	0.81	chi-sq	[1]	0.02	chi-sq	[1]	0.19	chi-sq	[1]	2.74	chi-sq	[1]	2.80
func.form	chi-sq	[1]	0.22	chi-sq	[1]	0.14	chi-sq	[1]	0.24	chi-sq	[1]	0.68	chi-sq	[1]	0.70
normality	chi-sq	[2]	0.84	chi-sq	[2]	0.07	chi-sq	[2]	0.15	chi-sq	[2]	0.71	chi-sq	[2]	0.75
heterosc.	chi-sq	[1]	0.74	chi-sq	[1]	0.94	chi-sq	[1]	0.90	chi-sq	[1]	1.31	chi-sq	[1]	1.33
chow test	chi-sq	[4]	0.98	chi-sq	[4]	1.49	chi-sq	[4]	1.3	chi-sq	[4]	12.97	chi-sq	[4]	13.72

In order to test the model for Jamaica, it is necessary to estimate the income elasticity of demand for imports (π), and the income elasticity of demand for exports (ε) from their respective import and export functions. For consistency with Thirlwall's approach and in view of the empirical work reviewed in Section 6.2, imports and exports are specified as multiplicative functions of income and relative prices measured in a common currency (see equations (6.3) and (6.5)). The variables are all measured in real terms for the period 1961-92[30] and are estimated in logarithms in order to obtain the elasticities directly. The estimation technique used is Ordinary Least Squares.

Table 6.1 summarises the regression results of three import and two export equations. We will deal with the import function first. Real imports (in logarithms) are regressed on real domestic GDP (Y) and a relative price term (TTM) intended to measure import prices relative to the prices of import substitutes. To obtain an approximate measure of this relationship, the import price index is divided by the consumer price index. Given the long-run nature of the balance-of-payments constrained growth model, it is necessary to obtain the long-run elasticities. One method is to use the stock-adjustment approach (see Hussain, 1995) of equation {3}, Table 6.1. The short and long run elasticities will be the coefficient (say δ) on the income term (log Y) and (δ/1-q) respectively, where q is the coefficient on the lagged dependent variable. However, log $M_{(t-1)}$ is insignificant in equation {3}.

Given the dependence of Jamaica on imports of consumer, intermediate and capital goods, a high income elasticity of imports can be expected. This would also be consistent with the income elasticities of imports found for many developing countries. The static equation {2} of table 6.1 which omits the insignificant lagged dependent variable, gives a higher income elasticity than equation {3}: 1.21 compared to 1.07. In effect, the traditional import function specification of equation {2} treats the coefficient on log Y as the long-run (or constant) elasticity.

Atesoglu (1993) lags the relative price term by one period in order to capture the so-called J-curve effect. In many developing countries including Jamaica, there may be an insufficiency of close substitutes for imports, or there may exist bottlenecks that give rise to

[30] The sources are the International Financial Statistics and the World Tables published by the I.M.F and World Bank respectively. Data for all the variables are available only up to 1992.

time lags between changes in relative prices and the ease of substituting imports for domestically produced goods and vice versa. In addition, in the context of our current discussion, the lagged price or J-curve effect (if it exists for Jamaica), may well have an income effect. That is, taking account of changes in lagged rather than current time, relative prices may well provide a better estimate of the income elasticity of demand for imports because of the lagged effect that changing prices have on real income. We therefore use the import function of equation {1}, Table 6.1:

$$\log M = -2.04 + 1.24 \log Y - 0.17 \log TTM_{(t-1)} - 0.34\ Du77 \qquad (6.20)$$

where M is real imports of goods, Y is real domestic GDP, TTM is the relative price variable, and Du77 is a dummy variable for 1977, a year in which real imports plunged to their 1965 level as a result of the signing of a Standby Agreement with the IMF.[31] The equation is well determined and all the variables have the correct signs and are significant at the five per cent confidence level (see Table 6.1 for the full results).

The income elasticity of demand for imports is 1.24 from equation (6.20), while the price elasticity is -0.17. The income elasticity is, as expected, significant and positive, while the price elasticity is, as expected, negative and small. Comparing equation (6.20) with equation {2} of Table 6.1, two points can be made concerning the existence of a J-curve effect in Jamaica and its impact on the elasticity of demand for imports. The only difference in the variables between the two equations is the lag on the price term. This gives a price elasticity of demand for imports that is 13 per cent higher (0.17 instead of 0.15) and a slightly higher income elasticity (1.24 compared to 1.21). It seems that in Jamaica it does take time for imports to adjust to relative price changes,but that the resulting measured increase in the price elasticity is not large.[32] In addition, the income effect of allowing for the adjustment to relative price changes, results in a slightly higher elasticity of demand for imports of 1.24. It is worth noting from Table 6.1 that the Chow test for predictive failure run on equation 6.20 (i.e. equation {1} of Table 6.1) indicates that the parameters are stable. A $\chi^2(4)$ value of 0.9776 is well within the required limit.

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[31] Although a two yaer agreement was signed in July 1977, it was abandoned in December 1977 when the government failed the eligibility criteria (see Chapter 1).

[32] Of course, the price elasticity itself is significant and this has implications for the balance of payments constrained growth model, as will be shown later on.

	real X to:	real X to:	real X to:	real X to:	real X to:	Main five		real gdp	real gdp	real gdp	real gdp	real gdp	real gdp
	USA	UK	CANADA	NETH.	NORWAY	% of Tot.		USA	UK	CANADA	NETH.	NORWAY	weighted
	%of tot.X	%of tot.X	%of tot.X	%of tot.X	%of tot.X	80		us$b	us$b	us$b	us$b	us$b	average
						%							us$b
1960	25.4	30.2	23.1	0.6	9.5	**88.9**		1853.5	200.4	160.0	171.0	175.1	**659.3**
1961	34.8	25.1	20.8	0.6	7.7	**88.9**		1899.0	206.4	165.9	177.0	187.3	**857.0**
1962	38.3	26.0	17.7	0.9	6.4	**89.3**		2009.8	208.1	177.6	184.5	193.6	**973.9**
1963	31.8	28.5	23.7	1.0	5.5	**90.5**		2094.1	217.4	186.8	191.2	200.9	**867.2**
1964	35.5	28.6	20.9	0.5	5.0	**90.4**		2211.9	229.0	199.3	206.2	211.0	**999.4**
1965	37.6	26.9	15.5	0.5	6.9	**87.3**		2334.6	234.0	212.4	217.6	222.2	**1134.0**
1966	31.1	21.7	12.3	0.4	5.5	**71.0**		2475.2	238.8	226.9	223.9	230.6	**1217.0**
1967	32.4	21.9	11.0	0.2	6.1	**71.6**		2536.8	245.3	233.5	236.1	245.0	**1279.6**
1968	34.2	20.9	12.4	0.1	7.4	**75.0**		2646.7	255.7	246.0	251.4	250.5	**1343.5**
1969	32.7	17.0	14.6	0.9	8.3	**73.6**		2718.1	259.1	259.2	282.6	261.8	**1352.6**
1970	54.4	17.7	7.6	0.3	7.8	**87.7**		2716.1	266.3	265.9	298.7	267.0	**1785.9**
1971	44.6	19.6	8.2	0.2	8.7	**81.3**		2798.0	273.7	281.2	311.3	279.3	**1659.7**
1972	44.1	21.7	5.4	0.2	11.5	**83.0**		2935.5	280.2	297.3	321.6	293.7	**1695.5**
1973	44.8	25.6	5.6	0.1	10.7	**86.8**		3087.2	301.7	320.3	336.6	305.8	**1740.8**
1974	45.1	15.0	5.1	0.2	11.4	**76.7**		3063.0	298.7	334.4	350.0	321.7	**1929.4**
1975	37.0	22.2	3.5	0.1	10.8	**73.5**		3041.8	296.6	343.1	349.7	335.1	**1684.8**
1976	40.0	16.0	4.0	0.8	10.7	**71.5**		3189.7	307.5	364.2	367.6	357.9	**1931.3**
1977	39.8	20.9	9.5	0.2	12.2	**82.6**		3334.6	310.7	377.4	376.1	370.7	**1783.3**
1978	34.4	21.2	8.0	0.6	7.2	**71.4**		3494.1	322.6	394.6	385.5	387.5	**1866.3**
1979	44.8	19.2	5.9	0.1	5.1	**75.1**		3580.9	330.2	409.9	394.8	407.2	**2280.8**
1980	37.5	19.4	3.9	0.1	10.9	**71.8**		3563.3	323.8	416.0	398.3	424.3	**2034.7**
1981	39.7	18.5	9.2	0.2	8.0	**75.6**		3625.1	320.3	431.3	395.6	428.0	**2078.7**
1982	33.6	18.3	12.2	1.4	8.0	**73.6**		3546.8	324.5	417.4	389.7	429.4	**1825.6**
1983	33.6	20.9	12.6	1.2	8.8	**77.1**		3685.2	336.4	430.6	395.2	449.3	**1826.9**
1984	51.5	14.0	14.8	1.1	3.6	**84.9**		3914.2	342.4	457.7	407.6	475.1	**2535.9**
1985	33.7	16.7	16.4	2.3	2.3	**71.4**		4038.7	355.3	478.8	418.2	500.2	**2130.4**
1986	34.3	17.9	16.2	7.2	2.9	**78.6**		4156.4	367.8	493.9	426.6	521.1	**2060.3**
1987	37.2	17.5	13.7	11.6	3.0	**83.1**		4282.9	384.1	513.8	430.6	530.6	**2163.7**
1988	35.2	18.2	14.9	11.5	1.0	**80.8**		4450.9	399.2	537.1	443.1	529.8	**2199.8**
1989	35.7	15.5	12.7	11.6	4.5	**80.0**		4565.9	418.8	552.9	453.0	532.5	**2300.5**
1990	27.7	16.7	10.5	12.0	10.0	**76.9**		4602.7	420.4	551.5	499.8	541.0	**1974.8**
1991	30.4	16.2	10.4	8.9	7.2	**73.2**		4549.5	412.1	541.6	511.5	549.8	**2174.4**
1992	52.5	18.4	12.8	3.1	8.2	**95.0**		4645.4	410.2	545.5	519.9	568.3	**2784.9**

Table 6.2

Exports are also specified in Thirlwall's model as a multiplicative function of income and relative prices expressed in a common currency. In order to calculate the income elasticity of demand for exports (e), it is necessary to regress exports on world income (z), in accordance with Thirlwall's balance of payments constrained growth model. In practice we use a weighted average of the real GDP of the main countries to which Jamaica exports. Table 6.2 summarises the percentage of real exports to, and the real output levels of the five main purchasers of Jamaica's exports. For present purposes, world income is then calculated as the average GDP of the five countries, weighted by their respective export percentages. It should be noted that on average the five countries (the USA, the UK, Canada, the Netherlands and Norway) account for eighty per cent of Jamaica's exports over the period 1960-1992.

In the case of the export function, the stock-adjustment model is used in both equations {4} and {5} of Table 6.1, since the lagged dependent variable is significant. Either equation may be used, since the respective price and income elasticities are almost the same across the two equations. For consistency with the import function and also because of its marginally lower standard error, equation {4} is presented below.

$$\log X = -0.26 + 0.31 \log Z + 0.019 \log TTX_{(t-1)} + 0.43 \log X_{(t-1)} - 0.34DU83 \qquad (6.21)$$

where X is real exports of goods, Z is the weighted average "world" income explained above and TTX is the relative price term.[33] The results in full are summarised in Table 6.1. The lagged relative price term has the wrong sign and is statistically insignificant. We were unable to find any significant J-curve effect of relative price changes on exports. The coefficient on the lagged dependent variable $X_{(t-1)}$ is significant, suggesting that 57 per cent of adjustment to long-run equilibrium exports takes place in one year. In addition, the short and long-run income elasticities of demand for exports are quite different. The short-run elasticity is 0.31, while the long-run elasticity is 0.54. These results are almost the same if equation {5} is used instead of equation {4}.

As Table 6.1 shows, the Chow test of parameter instability indicates that the parameters in both equations {4} and {5} are unstable. The value for $\chi^2(4)$ is considerably

[33] TTX is the inverse of TTM described earlier.

Year	Food & Bev (%)	Crude Materials (%)	Manuf (%)	Total (%)
1964	45.4	46.5	8.1	100
1965	41.2	51.8	7.0	100
1966	40.5	52.4	7.1	100
1967	38.6	53	8.4	100
1968	37.1	53.8	9.1	100
1969	30.7	60.8	8.5	100
1970	22.7	70.7	6.6	100
1971	23.6	68.4	8.0	100
1972	24.5	67.7	7.8	100
1973	24.3	68.4	7.3	100
1974	19.5	75.5	5.0	100
1975	28.3	67	4.7	100
1976	20.7	72.7	6.6	100
1977	20.2	73.6	6.2	100
1978	18.5	75.4	6.1	100
1979	16.8	76.3	6.9	100
1980	13.4	78.8	7.8	100
1981	12.9	80.3	6.8	100
1982	17.1	70.4	12.5	100
1983	21.6	66.1	12.3	100
1984	16.8	71.3	11.9	100
1985	24.6	56.7	18.7	100
1986	27.0	54.0	19.0	100
1987	26.1	50.4	23.5	100
1988	24.7	53.6	21.7	100
1989	18.0	61.2	20.8	100
1990	19.8	65.1	15.1	100
1991	20.7	58.5	20.8	100
1992	23.3	54.7	22.0	100

above its acceptable limit in both cases. Performing the Chow test for varying periods and examining the values of the income elasticity of demand for exports (ε) and the relative price term (which is insignificant) confirm that they are both unstable. In the balance of payments constrained growth model, the income elasticity (ε) captures non-price competition and the characteristics of the goods exported. There is considerable evidence in support of the notion that non-price competition may be of even greater importance in international trade than relative prices.[34] It seems highly likely that the instability of ε in the export equations reflects elements of non-price competition as well as the changing structure of exports. According to Engels' Law, there is a tendency for primary products to have an income elasticity of demand less than unity, and for industrial products more than unity. Jamaica is a primary producer[35] and the income elasticity of demand for its exports (ε) is less than unity. However, the changing structure of its exports over the three decades of this study, may account in part, for the instability of (ε).[36]

Table 6.2(a) shows the structure of real exports between 1964 and 1992, comprising the percentage of exports attributable to: (i) food and beverages[37] (including primary agricultural commodoties such as bananas, coffee, citrus, etc.), (ii) crude materials including bauxite, alumina and fuels, and (iii) manufactured goods. The importance of agricultural commodities declined from 45 per cent of total merchandise exports in 1964 to under 13 per cent in 1981 and then recovered to around 23 per cent in 1992. At the same time, exports of crude materials (mainly bauxite and alumina), rose from 47 per cent of exports in 1964 to 80 per cent in 1981, and then declined to 55 per cent in 1992. Manufactured exports increased from 8 per cent in 1964 to 22 per cent in 1992. In general, the substantial changes in the structure of exports over the three decades of this study, seem to underlie the instability of the income elasticity of demand for exports (e). According to Engel's Law, primary products probably have income elasticities of demand less than unity, while manufactured items have income elasticities of demand greater than untiy.

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[34] See Chapter 4 of McCombie and Thirlwall (1994) and McCombie (1989).

[35] See Chapter 1.

[36] An additional factor underlying the stability of (ε) may be inconsistency in the quality of exports over the years.

[37] plus tobacco products.

The income elasticities of demand for imports and exports and the corresponding relative price elasticities have been obtained from the import and export functions estimated in this sub-section. The next sub-section makes use of the income elasticities in the models of balance-of-payments constrained growth, to predict the real growth rate.

6.4.3 The Balance-of-Payments Constrained Growth Model: The Evidence On Jamaica.

This sub-section tests the different versions of the balance-of-payments constrained growth model for Jamaica between 1961 and 1992[38] and evaluates the statistical accuracy of the predicted growth rates. The model is tested in its simple and extended forms using export growth [equations (6.15) and (6.14) respectively], and using the growth of world demand (εz)[i.e. equations (6.8) and (6.13) respectively].

The first four numbered columns of appendix (6.1) give the year-by-year and period average (1961-92) values for real export growth (x), real capital flows ($f-p_d$),[39] and their respective weights in total nominal export earnings [θ and $(1-\theta)$]. Columns {5} - {8} inclusive show the predicted growth rates of the simple models using (x) and (ez). Column {9} shows the actual growth rate (y). The period averages (1961-92) for theta and (1-theta) are simple averages, whereas the averages for (x), ($f-p_d$) and (y) are the continuously compounded growth rates of the respective variables. The income elasticities of demand for imports and exports are 1.24 and 0.54 respectively.

[38] The available data set is from 1960 to 1992 but the effective period is 1961-92 because of the use of lagged variables and growth rates.

[39] $(f-p_d)>0$ for inflows and $(f-p_d)<0$ for outflows.

			Balance of Payments Constrained Growth Model									
			Merchandise Trade basis (pi=1.2, e=0.54)									
	{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}
	Simple Equilib. Model with exp. growth	Simple Equilib. Model with forgn dem. grth	Extended Disequilib. Model with exp. growth	Extended Disequilib. Model with forgn. dem. grth	Actual Growth rate	Difference between actual grth and simple mod. x/pi	Contribut'n of capital flows to difference in col. {6}	Implied relative price movement effect	*Pure terms of trade effect on growth*	Difference between actual grth and simple mod.ez/pi	Contribut'n of capital flows to difference in col. {10}	Implied relative price movement effect
	x/pi	ez/pi	yb*	yb1*	y	{5} - {1}	{3} - {1}	{6} - {7}		{5} - {2}	{4} - {2}	{10} - {11}
1961 - 92	2.4	2.1	0.8	0.6	2.1	-0.3	-1.6	1.3	*0.2*	0.0	-1.5	1.5
|t|	1.176	0.306	6.175	7.191								

Table 6.3

The predictions of the model are summarised in table 6.3. The actual average (continuously compounded) long-run growth rate is 2.1 per cent over the period 1961-92. The basic model using exports (x/π) over-predicts the long-run growth rate by 0.3 percentage points, while the corresponding extended model (yb^*) with capital flows (column {3}) under predicts growth by 1.3 percentage points. Applying to the logic of the model implies that the rate of growth of real capital flows is less than the rate of growth of real exports [see equation (6.18) and the ensuing discussion]. Indeed, Appendix 6.A.1 not only confirms that exports grew faster than capital flows, but that the latter figure was negative (-3.14 per cent), while the former was positive (2.87 per cent). The under-prediction of the extended model (i.e growth of 0.8 per cent compared to actual growth of 2.1 per cent) is much more severe than the over-prediction of the simple model (2.4 per cent compared to actual growth of 2.1 per cent). This is consistent with our findings in chapter four that lower net capital inflows have adverse implications for investment and growth.

Real net capital inflows declined by 20 per cent between 1960 and 1992 for two reasons. Firstly, real private capital inflows fell substantially after 1973 as a result of loss of confidence in the authorities and the economy. This went hand-in-hand with the decline in foreign investment[40] as the government pursued inward-looking policies. In addition, developments in the international bauxite market led to a loss of Jamaica's market share.[40]

[40] See Chapter 1.

Secondly, as found in Chapter 5, net capital inflows declined because of capital flight. Not only might capital have been exported by foreign-owned multi-national companies operating principally in the export sector, but there may well hae been substantial capital flight via the informal financial market (though concrete facts and figures in support of this are hard to come by).

Considering the growth rates in Table 6.3, column {6} shows the difference between actual growth and the simple model (using export growth). The difference of (-0.3) is more than accounted for by capital flows growing more slowly than exports. This should have caused actual growth to be even lower (by 1.3 percentage points), but by implication favourable relative price movements worked in the opposite direction to prevent further deterioration in actual growth. The implied relative price movement comprises a pure terms of trade effect, and a volume effect on imports.[41] The pure terms of trade effect of 0.2 per cent is obtained independently from the change in the terms of trade (divided by π).[42] This leaves an import volume effect of 1.1 percentage points. In terms of our earlier discussion in Section 6.2, this residual is a measure of both the import volume effect of relative price changes (related to the relative price elasticities of imports in the previous sub-section), and any effects of omitting other current account variables from the measurement of imports and exports. Given the close approximation of the simple model's predicted growth rate to the actual growth rate, it seems that the effect of omitted variables must be minimal.

Indeed, if the simple model in the form ($\varepsilon z/\pi$), is used, the actual growth rate is predicted accurately. It appears that the estimates of the income elasticity of demand for exports (ε) and the weighted average proxy for the growth of world demand (z) are accurate. Once again, the extended model significantly under-predicts actual growth for the same reasons given above. The contribution of capital flows growing more slowly than exports (indeed the growth rate of capital inflows is negative as before), now stands at (-1.5) percentage points, while the implied relative price movement is (1.5) percentage points.

The simple model using ($\varepsilon z/\pi$) gives a better prediction than either of the extended models or the simple form (x/π). However, the question of "how close is close" in a statistical

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[41] Both divided by the income elasticity of demand for imports (π).

[42] The 'terms of trade' is the export price index divided by the import price index.

sense needs to be addressed. A test suggested by McCombie (1989) to evaluate the accuracy of the model's predictions, and appropriate for an individual country will be employed. First y_B is set equal to y and the income elasticity of demand for imports (π^1) that would maintain balance-of-payments equilibrium, is calculated. That is, $\pi^1 = x/y$. There will then be two expressions for growth: $y = x/\pi^1$ and $y_B = x/\pi^\wedge$, where $\pi^\wedge$ is the estimated income elasticity of demand for imports from the appropriate regression. If π^1 and$\pi^\wedge$ are not statistically different then that will also be true of y and y_B.

The absolute values of the t-statistic (|t|) are calculated using the standard errors of the appropriate regressions, and the results recorded in Table 6.3. It can be seen from the table that both simple models are statistically accurate, with the one using ($\varepsilon z/\pi$) being superior, as expected. Both extended models are well outside the range of acceptability. The simple Harrod growth rule and the model in the form ($\varepsilon z/\pi$) predict long run growth in Jamaica quite well. Long-run growth in Jamaica is export driven rather than foreign capital accommodated. Indeed, because of the reduction in capital inflows over the period, growth has been slower than otherwise would have been the case.

In order to arrive at some notion of what growth might have been in the absence of capital flows, Hussain (1995) calculates what he calls the "Counter-Factual" balance-of-payments constrained growth rate. He[43] defines this as the rate of growth of real income that would have prevented further deterioration (improvement) in the initial current account deficit (surplus) with no nominal capital inflows. In effect, Hussain[44] sets the rate of growth of nominal capital inflows to zero, in his version of equation (6.11), which is reproduced here in a slightly changed form with (x) replacing (εz):

$$y_B = \frac{(\theta\eta + \psi)(p_d - e - p_f) + (p_d - e - p_f) + \theta x + (1-\theta)(f - p_d)}{\pi} \qquad (6.22)$$

Setting the growth of nominal capital flows to zero gives:

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[43] Op. Cit.

[44] Although Hussain refers to setting nominal capital flows to zero, it is the growth rate of nominal capital flows that he sets to zero, and this is implied in his version of equation (6.23).

$$y_B = \frac{(\theta\eta + \psi)(p_d - e - p_f) + (p_d - e - p_f) + \theta x - p_d(1-\theta)}{\pi}$$

(6.23)

However, the variables explaining real growth in Thirlwall's model are real variables. In our view the rate of growth of output that would have prevented further change in the position of the initial current account (i.e. the true counter factual growth rate), should exclude the effects of real, not nominal, capital growth. The approximate counter-factual balance-of-payments constrained growth rate can be obtained directly from Table 6.3 in one of two ways. Assuming that the models with (x) are being considered, it can either be found by taking away the contribution of capital flows in column {7} from actual growth in column {5}, or by adding the contribution of implied relative price movements (column {8}) to the simple model prediction of column {1} (which does not include capital flows or price movements). In both cases the "true" or Counter-Factual balance of payments constrained growth rate without real capital growth is 3.7 percent. Without the damaging effect of negative capital flows growth (or equivalently, without the contraction of capital inflows), the Jamaican economy would have grown by approximately 3.7 per cent on average instead of 2.1 per cent over the period. Similar reasoning applies if (εz) is used instead of (x).

Our finding that economic growth in Jamaica is constrained by the balance of payments, is consistent with the apparent under utilisation of domestic resources. Many writers (e.g. Stone and Wellisz 1993, Levitt 1991, Boyd 1988 and Brown 1981) comment on the unemployment of resources that existed throughout the thirty-odd years covered by this study. This is an indication that growth was not constrained by full capacity, while our findings in this chapter suggest that the balance of payments might be the main constraint on growth.

Resource under-utilisation might well be associated with diminishing-returns activities in the agricultural sector[45] which is an important part of the Jamaica economy. In addition, unemployment and under-employment may be partly linked to the political and social instability which characterised the post 1973 period. Also, the shortfall in capital inflows to finance domestic activity will have been related to the apparent under-utilisation of resources. Unemployment went together with the constraint on growth imposed by the balance of payments.

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[45] See McCombie and Thirlwall (1994).

Import and Export functions - current account basis

	{1} - logM			{2} - logM			{3} - logM			{4} - logX			{5} - logX		
Vbls.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.	coeff.	t-ratio	prob.			
CONST.	-2.15	-3.06	0.005	-2.04	-3.20	0.003	-1.77	-2.40	0.024	0.82	1.30	0.204	0.77	1.22	0.234
logY	1.40	9.63	0.000	1.37	10.3	0.000	1.1	4.57	0.000						
logTTM				-0.15	-4.66	0.000	-0.11	-2.83	0.01						
logZ										0.29	2.91	0.007	0.27	2.73	0.011
logTTX													0.19	3.87	0.001
DU77	-0.45	-3.54	0.001	-0.45	-3.58	0.001	-0.46	-3.73	0.001						
DU83										-0.27	-2.46	0.020	-0.28	-2.5	0.019
$logM_{(t-1)}$							0.23	1.56	0.130						
$logTTM_{(t-}$	-0.18	-4.58	0.000												
$logX_{(t-1)}$										0.32	2.19	0.037	0.35	2.44	0.022
$logTTX_{(t-1)}$										0.21	4.01	0.000			
R - sqrd.		0.88			0.89			0.89			0.90			0.90	
R bar-sqd		0.87			0.88			0.88			0.89			0.88	
D.W.		1.64			1.67										
Durbin-h								0.07			0.88			1.84	
F	(3,28)	70.71	, 0.00	(3,29)	79.10	0.000	(4,27)	56.27	0.000	(4,27)	61.7	, 0.00	(4,27)	59.9	, 0.00
S.E.		0.12			0.12			0.12			0.11			0.11	
n		32			33			32						32	
ser.corr	chi-sq	[1]	0.70	chi-sq	[1]	0.45	chi-sq	[1]	0.12	chi-sq	[1]	1.19	chi-sq	[1]	1.79
func.fm.	chi-sq	[1]	4.44	chi-sq	[1]	3.64	chi-sq	[1]	3.98	chi-sq	[1]	0.36	chi-sq	[1]	1.10
normal.	chi-sq	[2]	6.02	chi-sq	[2]	2.83	chi-sq	[2]	1.71	chi-sq	[2]	0.04	chi-sq	[2]	0.40
heterosc.	chi-sq	[1]	0.34	chi-sq	[1]	0.75	chi-sq	[1]	0.98	chi-sq	[1]	0.05	chi-sq	[1]	0.04
chow test	chi-sq	[4]	2.60	chi-sq	[4]	4.39	chi-sq	[4]	3.79	chi-sq	[4]	2.07	chi-sq	[4]	1.81

6.4.3.1 The Current Account and the Balance of Payments Constrained Growth Model.

The derivation of Thirlwall's[46] model starts with equation (6.1) ($P_dX = P_fME$), which represents the current account equilibrium of the balance of payments. In principle the entire current account should be considered, but in practice merchandise trade is used for the reasons discussed earlier. In this sub-section, the whole current account is used to test the model. However, taking this approach will not guarantee the better performance of the model. Whether or not it predicts better than the model based on merchandise trade (which performed with statistical accuracy in the case of Jamaica), depends on the accuracy of the price indices and parameter estimates [especially (π) and (ε)] from the import and export equations.

Table 6.4 summarises the results of three import and two export equations. Considering the import function[47] first, equation {3} shows that the lagged dependent variable is insignificant. In addition, an examination of equations {1} and {2} indicates that lagging the relative price term log TTM in equation {1} results in a slightly higher relative price elasticity (-0.18 compared to -0.15) and income elasticity of demand for imports (1.40 compared to 1.37). However, equation {1} does not pass the test for normality and functional form. The static equation {2} is well-specified, has a lower standard error, and is therefore to be preferred. There is then no measurable J-curve effect and the import function is :

$$\mathbf{\log M = -2.04 + 1.37 \log Y - 0.15 \log TTM - 0.45\ Du77} \qquad \mathbf{(6.24)}$$

where imports (M) comprise all debit items on the balance-of-payments current account deflated by the consumer price index. The variables Y, TTM and Du77 are, respectively, real GDP, the relative price term, and the dummy variable for 1977 (as before). All the variables are significant and have the expected signs. The complete results and tests of equation (6.24) are summarised in Table 6.4 (as equation {2}).

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[46] Op. Cit.

[47] Ideally, price indices should be obtained for each component of the current account. In practice total imports and exports are deflated by the consumer price index.

Deflating all the current account debits by the consumer price index to obtain (M), inevitably provides an approximate value of total real imports and the potential for error is substantial. The long-run[48] elasticity of demand for total imports is 1.37 compared to 1.24 when merchandise trade is used. The parameters of the equation are stable (see Chow's $\chi^2(4)$ test of predictive failure for equation {2} of Table 6.4).

Two export equations are summarised in Table (6.4), both of which are well-determined. The lagged dependent variable is significant in both, and equation {4} which has a slightly lower standard error than equation {5}, is used for the export function:

$$\mathbf{\log X = 0.82 + 0.29 \log Z + 0.21 \log TTX_{(t-1)} + 0.32 \log X_{(t-1)} - 0.27\ Du83.} \qquad \mathbf{(6.25)}$$

where X is the sum of all the credit items on the current account of the balance of payments, and the other variables are the same as for the merchandise export function. All the variables are significant. The short-run income elasticity of demand for total exports is 0.29 and has the expected positive sign, while the long-run elasticity (ε) from the above stock-adjustment equation is 0.42. The relative price term (log TTX) is significant, but appears to be perverse (i.e. it has an unexpected positive sign). The equation as a whole passes the test for parameter stability, but an examination of individual parameters[49] indicates that the income and price elasticities both exhibited some variability (which possibly cancelled out in the equation as a whole).

Appendix 6.2 gives the detailed annual data for the basic and extended models using both export growth (X) and foreign demand growth (εz). It is similar to Appendix 6.1. Table 6.5 below shows the various growth rates predicted by the simple [(x/π) and (ε/z)], and extended models (see columns {2} and {4} for the extended model predictions).

[48] Since the lagged dependent variable is insignificant in the stock-adjustment models, equation (6.24) is used to obtain (π).

[49] Several Chow tests were performed over varying periods.

		Balance of Payments Constrained Growth Model							
			Current Account basis (pi=1.4, e=0.42)						
	{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}
	Simple Equilib. Model with exp. growth	Simple Equilib. Model with forgn dem. grth	Extended Disequilib. Model with exp. growth	Extended Disequilib. Model with forgn. dem. grth	Actual Growth rate	Difference between actual grth and simple mod. x/pi	Contribut'n of capital flows to difference in col. {6}	Implied relative price movement effect	***Pure terms of trade effect on growth***
	x/pi	**ez/pi**	**yb***	**yb1***	**y**	**{5} - {1}**	**{3} - {1}**	**{6} - {7}**	
1961 - 92	2.7	1.4	1.7	0.6	2.1	-0.6	-1.0	0.4	***0.2***
| t |	2.505	3.302	2.131	6.692					

TABLE 6.5

The simple Harrod growth rate (x/π) seems to predict actual growth well: a predicted rate of 2.7 per cent (column {1}) as against actual growth of 2.1 per cent (column {5}). The simple model using export growth (x) overpredicts, while the corresponding extended model under-predicts (1.7 per cent in column {3}, compared to actual growth of 2.1 per cent). The difference between actual growth and the prediction of the simple model using (x), is (-0.6) per cent (col. {6}), while capital flows growing more slowly than exports (see columns {4} and {2} respectively, of Appendix 6.2,), should have made the "deficiency" in growth (-1.1) instead of (-0.6). This must imply that favourable relative price movements partially offset the influence of capital growth by 0.5 per cent. Given the pure terms of trade effect of 0.2 per cent (as before), the effect of relative price changes (other than pure terms of trade movements) on growth, via their effects on imports, is 0.3 per cent. Given that the entire current account was used in the import and export functions, this last residual (0.3 per cent) is free of the effects of variables omitted from the current account and is perhaps more reasonable than the residual in the trade-based model.

On the other hand, the much greater imprecision in measuring the price elasticities and in estimating the income elasticities seem to have rendered the predictive power of the simple model less accurate than the model based on trade data alone. The trade-based model using (x)

predicts growth of 2.4 per cent, the current account-based model gives a prediction of 2.7 per cent, while actual growth is 2.1 per cent. In fact, when the t-statistic test on the predictive power of the model based on the whole current account is applied, all the versions of the model failed, including the simple model x/π which predicts growth of 2.7 per cent (although the extended model using export growth only just failed. In other words the prediction of 2.7 per cent is not statistically close to actual growth of 2.1 per cent when the whole current account is used. A cursory inspection of Table 6.5 suggests that both the income elasticities of demand for imports (π) and exports (e) are under-estimated. It seems that the parameters of the simple (x/π) trade-based model can be estimated with greater statistical precision, despite (perhaps because of) the omission of the invisible items of the current account. The prediction of both versions of the simple model using trade data are statistically accurate, while those of the extended model are not (see the previous sub-section). All versions of the current account model are statistically imprecise.

6.5 Summary and Conclusions

This chapter has analysed the Balance-of-Payments Constrained Growth model and tested it on data for Jamaica for the period 1961-1992. The simple and extended versions of the model with capital flows were estimated using both export growth (x) and growth in world demand (εz). The model was tested using merchandise imports and exports in the first instance, and then total current account[50] imports and exports. Income and price elasticities of demand were estimated from static and simple dynamic import and export functions in logarithmic form, using ordinary least squares.

Chow tests of parameter instability were performed as part of the usual diagnostic tests. The parameters, particularly the income elasticity of demand for imports (π), are important for the performance of the model and the precision of its predictions of growth. The crucial parameter π was found to be stable. T-tests were carried out on the predicted growth rates of the model to determine their statistical accuracy and to evaluate the performance of the different versions of the model.

[50] of the balance of payments.

The fundamental question to be answered is whether or not the long run growth rate in Jamaica is balance-of-payments constrained and whether the balance of payments constrained growth model accurately predicts long-run growth. It was found that the simple model in both its forms predicted growth with statistical accuracy. With actual average growth between 1961 and 1992 being 2.1 per cent, the version (x/π) gave a predicted growth rate of 2.4 per cent, while ($\varepsilon z/\pi$) gave 2.1 per cent. In general, the predictions of the extended models incorporating capital flows were not statistically accurate.

Growth in Jamaica was found to be export driven and balance-of-payments constrained, supporting Thirlwall's model. In the long run growth approximates to the rate of growth of exports divided by the income elasticity of demand for imports. The growth rate in the long run must be consistent with the constraints imposed upon it by the balance of payments. Not only was growth found to be export led, but declining capital inflows were found to have an adverse effect on the growth process. The economy could have grown at an average rate of 3.7 per cent instead of 2.1 per cent between 1961-1992, had it not been for declining real capital inflows over the period 1960-1992.

The policy implication is that the development planning process in Jamaica must include measures to encourage export growth if sustained economic growth is a macroeconomic goal. Attention would also need to be paid to improving the structure of production in the export sector away from primary commodities with income elasticities of demand less than unity, and in favour of industrial commodities with income elasticities of demand greater than unity. In addition, in the light of possible evidence of inconsistency in the quality of exported goods, the authorities would do well to improve the quality assurance mechanisms in the export sector. At the same time, measures to discourage capital flight and the loss of capital inflows could be worth up to an additional 1.6 percentage points on the real growth rate per annum. These measures might also improve resource utilisation which seems to have been severely impaired in Jamaica.

In addition, the pure terms of trade effect was found to have a favourable but small effect on real growth (0.2 per cent). The effect of changes in relative prices on the volume of imports seems to have been much bigger though surprisingly high (1.3 per cent) and to have offset the adverse impact of declining capital inflows to some extent. The price elasticity of demand for imports was found to be normal and this would have offset the favourable

movement in the terms of trade to some extent. There is some evidence that the price elasticity of demand for exports could be perverse.[51]

It was found that the simple trade-based model gave statistically more accurate predictions than the model based on the whole current account. The imprecision in measuring price indices and in estimating the income and price elasticities more than offset any theoretical advantage of the latter approach.

The general implications of our findings are that faster growth in Jamaica can be achieved by making exports more attractive and expanding export capacity, by reducing the income elasticity of demand for imports, and by creating a favourable domestic economic (and political) climate that would encourage capital inflows.

[51] That evidence comes from the export function using data for the current account of the balance of payments. The elasticity using trade data was unstable.

Balance of Payments Constrained Growth Model (pi=1.2; e=0.54)

(Imports and Exports refer to merchandise trade only)

	{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}
Period	Exports Share	Export Growth	Capital Flows Share	Capital Flows Growth	Equilib. Model x/pi	Equilib. Model ez/pi	Disequilib. Model (with x)	Disequilib. Model (with ez)	Actual Growth
	(theta)	x	(1-theta)	(f-pd)	yb	yb1	yb*	yb1*	y
1961-92	0.685912	2.87	0.314088	-3.14	2.4	2.1	0.8	0.6	2.1
1961	0.899041	1.529263	0.100959	-64.5243	1.274386	13.4926	-4.28287	6.701807	2.374205
1962	0.924121	1.730638	0.075879	-25.6158	1.442198	6.139493	-0.28699	4.053874	0.924341
1963	1.11869	11.25849	-0.11869	-243.761	9.382071	-4.92969	34.60553	18.59511	4.358766
1964	0.721068	2.999265	0.278932	-475.537	2.499387	6.859784	-108.733	-105.589	8.465748
1965	0.788287	-3.50995	0.211713	-33.0077	-2.92496	6.061288	-8.12918	-1.04544	7.979626
1966	0.774944	25.27934	0.225056	35.46771	21.06612	3.292758	22.97691	9.203555	4.057047
1967	0.632006	-2.87286	0.367994	94.73346	-2.39405	2.315123	27.5381	30.51432	2.064641
1968	0.565974	-0.23943	0.434026	31.38875	-0.19953	2.24911	11.24002	12.62589	5.833764
1969	0.544197	9.275686	0.455803	19.35053	7.729738	0.304716	11.55652	7.515843	7.336475
1970	0.531114	2.184456	0.468886	7.707052	1.82038	14.4148	3.978271	10.66734	6.983939
1971	0.503369	-4.51571	0.496631	6.708428	-3.76309	-3.17924	0.882115	1.176012	4.112456
1972	0.49345	-4.13385	0.50655	-0.25358	-3.44487	0.96932	-1.80692	0.371268	8.010773
1973	0.445568	4.744498	0.554432	26.96577	3.953748	1.202185	14.22056	12.99456	3.007396
1974	0.811543	50.91927	0.188457	-71.8348	42.43272	4.875265	23.15446	-7.32502	-5.28
1975	0.586324	-8.42588	0.413676	178.2229	-7.02156	-5.70495	57.32179	58.09376	-1.32157
1976	0.518688	-26.0614	0.481312	-2.75454	-21.7178	6.584838	-12.3696	2.310651	-6.03299
1977	0.89214	1.080399	0.10786	-86.8304	0.900333	-3.44843	-7.00136	-10.8811	-2.42645
1978	0.882553	29.77635	0.117447	42.84702	24.81362	2.094902	26.09289	6.042413	0.591271
1979	0.739716	-4.73392	0.260284	151.8945	-3.94493	9.993308	30.02828	40.33862	-1.89318
1980	0.738437	-6.72472	0.261563	-6.10385	-5.60393	-4.85468	-5.4686	-4.91533	-5.70397
1981	0.590804	-10.2631	0.409196	75.46686	-8.55257	0.972595	20.68103	26.30854	2.561282
1982	0.481098	-26.0413	0.518902	15.17357	-21.7011	-5.47949	-3.87905	3.925153	1.37584
1983	0.487626	-13.1539	0.512374	-15.3944	-10.9616	0.033043	-11.9183	-6.55698	2.22237
1984	0.498156	63.53132	0.501844	56.78514	52.94277	17.46234	50.12149	32.44671	-0.82461
1985	0.457589	-9.17734	0.542411	6.866967	-7.64778	-7.19466	-0.39561	-0.18826	-4.69429
1986	0.836645	-11.2426	0.163355	-85.3801	-9.36882	-1.48232	-19.4611	-12.8629	-2.11906
1987	0.68385	12.86414	0.31615	167.2374	10.72011	2.259463	51.39106	45.60524	7.601431
1988	0.990243	15.16798	0.009757	-97.5455	12.63998	0.750231	11.72356	-0.05019	3.12362
1989	0.561045	3.714521	0.438955	8135.741	3.095434	2.059366	2977.754	2977.173	5.898664
1990	0.599896	18.64171	0.400104	1.137463	15.53476	-6.3704	9.698498	-3.44233	7.855598
1991	0.695663	10.44371	0.304337	-27.5562	8.703089	4.54817	-0.93424	-3.82466	-1.27922
1992	0.955335	4.310411	0.044665	-88.8524	3.592009	12.63502	0.124413	8.763514	6.15263

			Balance of Payments Constrained Growth Model (pi=1.4, e=0.42)						
			(Imports and Exports refer to the entire current account)						
	{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}
Period	Exports Share	Export Growth	Capital Flows Share	Capital Flows Growth	Equilib. Model x/pi	Equilib. Model ez/pi	Disequilib. Model (with x)	Disequilib. Model (with ez)	Actual Growth
	(theta)	x	(1-theta)	(f-pd)	yb	yb1	yb*	yb1*	y
1961-92	0.785592	3.8	0.214408	-3.14	2.7	1.4	1.7	0.6	2.1
1961	0.936488	0.222564	0.063512	-64.5243	0.158974	8.995068	-2.77832	5.496571	2.374205
1962	0.953149	2.631434	0.046851	-25.6158	1.879596	4.092995	0.934308	3.044008	0.924341
1963	1.067979	11.01563	-0.06798	-243.761	7.868304	-3.28646	20.23936	8.326303	4.358766
1964	0.808207	0.728978	0.191793	-475.537	0.520699	4.57319	-64.7254	-61.4502	8.465748
1965	0.867847	4.400729	0.132153	-33.0077	3.143378	4.040859	-0.38778	0.391099	7.979626
1966	0.850047	16.93777	0.149953	35.46771	12.09841	2.195172	14.08314	5.664928	4.057047
1967	0.733925	-5.24515	0.266075	94.73346	-3.74654	1.543415	15.25475	19.13718	2.064641
1968	0.697433	9.797095	0.302567	31.38875	6.997925	1.499407	11.6643	7.829457	5.833764
1969	0.671427	5.806006	0.328573	19.35053	4.147147	0.203144	7.325982	4.677873	7.336475
1970	0.651762	-1.35144	0.348238	7.707052	-0.96531	9.609866	1.287909	8.180409	6.983939
1971	0.633315	-1.52793	0.366685	6.708428	-1.09138	-2.11949	1.065869	0.41475	4.112456
1972	0.632484	-0.6097	0.367516	-0.25358	-0.4355	0.646213	-0.34202	0.342152	8.010773
1973	0.583596	3.397737	0.416404	26.96577	2.426955	0.801457	9.43682	8.488185	3.007396
1974	0.861875	25.39716	0.138125	-71.8348	18.14083	3.250177	8.547881	-4.28601	-5.28
1975	0.667405	-10.5267	0.332595	178.2229	-7.51908	-3.8033	37.32174	39.80167	-1.32157
1976	0.608044	-24.8217	0.391956	-2.75454	-17.7298	4.389892	-11.5517	1.898061	-6.03299
1977	0.919734	-2.72429	0.080266	-86.8304	-1.94592	-2.29895	-6.76799	-7.09268	-2.42645
1978	0.914634	33.56906	0.085366	42.84702	23.9779	1.396601	24.54363	3.890003	0.591271
1979	0.817646	5.415959	0.182354	151.8945	3.868542	6.662205	22.94776	25.23198	-1.89318
1980	0.815106	-7.68163	0.184894	-6.10385	-5.48688	-3.23645	-5.27851	-3.44417	-5.70397
1981	0.706402	-4.23589	0.293598	75.46686	-3.02564	0.648397	13.68905	16.2844	2.561282
1982	0.645266	-12.9256	0.354734	15.17357	-9.23256	-3.65299	-2.11277	1.487545	1.37584
1983	0.664478	-7.88681	0.335522	-15.3944	-5.63344	0.022029	-7.43271	-3.67477	2.22237
1984	0.666761	58.40156	0.333239	56.78514	41.7154	11.64156	41.33064	21.27859	-0.82461
1985	0.678036	12.47973	0.321964	6.866967	8.914096	-4.79644	7.623303	-1.67293	-4.69429
1986	0.929719	-8.1649	0.070281	-85.3801	-5.83207	-0.98821	-9.70836	-5.20493	-2.11906
1987	0.842404	7.984722	0.157596	167.2374	5.703373	1.506309	23.6302	20.09458	7.601431
1988	0.996132	18.25176	0.003868	-97.5455	13.03697	0.500154	12.71704	0.228712	3.12362
1989	0.746797	-5.67832	0.253203	8135.741	-4.05594	1.372911	1468.393	1472.447	5.898664
1990	0.762877	10.32129	0.237123	1.137463	7.372353	-4.24693	5.816857	-3.04723	7.855598
1991	0.827859	8.290511	0.172141	-27.5562	5.921794	3.032113	1.514148	-0.8781	-1.27922
1992	0.98011	14.22104	0.01989	-88.8524	10.15788	8.423345	8.693486	6.993447	6.15263

CHAPTER 7

CONCLUSIONS

The financing of economic development has been identified by many researchers as a critical element of the growth and development process. This thesis has examined the financing of economic growth and development in Jamaica over the period 1960-1992. In so doing, three broad issues were explored: the impact of financial variables and financial policy on the real economy; the effect of debt accumulation on domestic savings, investment, growth and balance of payments stability; the effect of foreign capital flows on the domestic economy, and the extent to which economic growth is constrained by the balance of payments.

Chapter One gave an overview of economic performance and the policy stance of successive governments over the three decades of this study. In addition, three sub-periods were identified and economic developments analysed for each: the years of steady growth and low inflation, 1960-1972; the years of crisis when inflation was high and growth was negative, 1973-1980; and the period of faltering recovery, 1981-1992, during which the growth performance and inflation experience were mixed.

It was seen in Chapter One that the economic fortunes of Jamaica were greatly influenced by the ideological stance of the government of the day and the policies it employed to give practical effect to that stance. In particular, the rapid public sector expansion and inward-looking policies of the nationalist government[1] of the 1970s led to high inflation, high external debt ratios and negative economic growth. Subsequent attempts by the conservative government[2] to generate growth by slashing the government deficit, while undergoing IMF programmes, resulted in the severe recession of 1984-1986 and an escalation in foreign indebtedness. Attempts by both political parties to stimulate savings, growth and investment and to lower inflation by raising interest rates were unsuccessful.

Chapter Two provided a survey of the literature on financial liberalisation and the role of the financial system in economic development. The hypothesis that raising the real interest rate increases saving, investment and growth was seen to have weak support, even from a

[1] The People's National Party led by Michael Manley.
[2] The Jamaica Labour Party led by Edward Seaga.

theoretical point of view. Theoretically, the effect of interest rates on saving is ambiguous, the outcome depending on the relative strengths of the negative substitution[3] and positive income effects on savings. The net effect could be positive, negative or neither. In addition, raising the interest rate might deter rather than increase investment by lowering its yield relative to that on financial assets.

The empirical evidence on the impact of the interest rate and financial deepening on savings, investment and growth in Jamaica was examined in Chapter Three. It was found that the real interest rate was insignificant in determining both total saving and private saving. Private and total saving were both strongly influenced by real income, in keeping with Keynesian analysis. However, real interest rates have a positive effect on financial savings, with savers substituting financial for non-financial savings, curb market assets, or savings held abroad, in response to rising real deposit interest rates. In addition, no support was found for the hypotheses that financial deepening increases saving (though there is some evidence that financial deepening encourages private saving), and that higher required reserve ratios on the banking system reduce the amount of credit available for investment.

Chapter Three found that investment in Jamaica is determined by both supply and demand factors. The availability of credit has a positive effect on investment, so that the rate of interest (r) has an indirect positive effect on investment since raising (r) increases financial savings and credit availability. However, higher rates of interest lower expected investment yields and have a significant direct negative effect on investment which outweighs the positive effect via credit availability. The most significant positive determinant of investment was found to be the lagged accelerator,[4] indicating that demand conditions are the principal determinant of investment, but that investors take time to respond to changes in demand. In addition, the rate of interest and financial deepening have no significant effect on the productivity of investment. It is the rate of economic growth that improves investment productivity in Jamaica. Also, the rate of interest has no significant effect on real economic growth, while the rate of growth of exports and the ratio of foreign savings to GDP have a positive impact on growth.

There are several policy implications of our findings regarding the effects of the interest rate and financial variables on savings, investment and growth in Jamaica. If stimulating real growth is a macro-economic goal, it will be better served by measures aimed at stimulating

[3] i.e. the substitution of financial for non-financial savings.
[4] changes in real GDP lagged one period.

exports and providing the right domestic climate for foreign capital inflows. Attempting to generate growth by raising the interest rate is ill-conceived at best.

In addition, raising the interest rate may deter investment by adversely affecting future yields. It would be more appropriate to actively target the export sector and foreign investment to stimulate growth, which will in turn stimulate[5] investment. Increasing real output rather than raising the interest rate will also have a positive effect on private and total savings. If for some reason the composition of total or private savings is deemed to be undesirable, e.g. if the government wishes to attract informal savings into the formal financial market, then the interest rate could be raised. However, the right interest rate level would have to be found so as not to affect investment adversely.

Chapter Four found that raising the interest rate does not lower inflation in Jamaica and that pursuing a high interest rate policy to control inflation is inappropriate (and as seen in Chapter Three, may be inimical to investment). Inflation on the one hand and monetary growth and currency depreciation on the other, are positively related. Fiscal expansion working through the growth in the money supply, was in all likelihood inflationary, particularly as government production was not very efficient. Improving government productivity might be one way to increase effective real supply of goods and services to reduce excess demand and contain inflationary pressures. In addition, a more stable currency (and economy) might reduce the numerous and substantial currency depreciations which occurred during the 1970s, 1980s and early 1990s, thereby reducing one source of inflationary pressure.

Chapter Four also found that inflation relative to expected inflation does not lower financial savings or reduce the availability of credit for investment. In addition, Inflation has no significant overall effect on investment and growth in Jamaica. However, there is some evidence that investment is stimulated at low levels of inflation (but not significantly), and deterred when inflation is high (but again not significantly). Inflation is probably an integral part of the growth process and implementing policies which attempt to eradicate it completely[6] might be inimical to the growth process. However, excessive inflation (perhaps above ten per cent)[7] might have an adverse effect on growth. Bringing the high inflation of the 1990s under control will be no mean task for the Jamaican Authorities.

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[5] i.e. with a lag.
[6] if this were possible.
[7] See Ghatak (1981).

An important conclusion of Chapter Four is that inflation widens the government deficit in Jamaica, as revenue lags behind expenditure when inflation is high. In addition, larger deficits increase government borrowing from the financial system at the expense of private borrowing (though this crowding out effect is small). Not only is there financial crowding out of the private by the public sector, but it was found that the investment of the latter reduces private investment by competing with the private sector for scarce resources. Moreover, public investment was found to be less efficient than private investment. Rapid expansion of the government sector occurred simultaneously with negative economic growth during the 1970s.

From the point of view of economic policy, urgent measures to improve public sector management and efficiency, particularly of capital programmes, are called for. This is not incompatible with private enterprise, and private sector investment and initiative should be encouraged at the same time.

Our findings in Chapter Five indicate that foreign capital inflows have no significant effect on saving in Jamaica. Similarly, the main components of capital inflows viz., government borrowing, foreign direct investment and private sector borrowing all have no significant impact on domestic savings. In addition, foreign capital inflows are used mainly for investment rather than consumption purposes, and this is supported by the significant positive relationship between capital inflows and investment. However, capital inflows have no significant effect on the productivity of investment. Financial variables, whether domestic or foreign, do not seem to have any significant impact on investment productivity which is determined instead by the real growth rate.[8]

Capital outflows which can deprive the economy of resources for investment, were found to have a negative impact on real growth, while capital inflows were found to be a stimulant to growth. Policies which encourage capital inflows and discourage outflows (particularly capital flight) can be expected to provide additional resources to the domestic economy and to raise the growth rate. In particular, foreign direct investment and private sector borrowing from abroad have significant favourable effects on investment and should be encouraged.

Savings, investment and growth were adversely affected by foreign debt accumulation, but there seemed to be no tendency for higher foreign debt to destabilise the balance of

[8] which may in turn be positively influenced by investment productivity in a beneficial circle.

payments in the sense that the current account progressively deteriorates without any self-correcting mechanism. Capital programmes should be financed more from public sector savings than from foreign borrowing. Reducing the debt burden built up over two decades is a considerable challenge for the government in the 1990s.

The main conclusion of Chapter Six is that the long-run rate of economic growth is constrained by the balance of payments. In other words, Jamaica cannot grow faster than that rate which permits equilibrium on the current account of the balance of payments. Growth in the long run must be consistent with the constraints placed upon it by the balance of payments.

Growth in Jamaica is not only balance-of-payments constrained, but is export driven. Policy measures to encourage export growth should have a significant positive impact on economic growth. In addition, re-structuring exports from primary commodities to manufactures should improve export demand, while proper quality control mechanisms can only be helpful to the export effort. The Balance of Payments Constrained Growth Model used in Chapter Six and which accurately predicts the long-run growth, implies that reducing the income elasticity of demand for imports is likely to have a stimulating effect on growth.

In addition, our findings in Chapter Six re-affirm the importance of foreign capital inflows to the growth process. Declining capital inflows were found to have a negative effect on real growth. A favourable domestic environment is likely to encourage capital inflows and discourage outflows, thereby increasing the availability of resources for investment and growth.

BIBLIOGRAPHY

Abramovitz, Moses (1952), "Economics of Growth", in Bernard F. Haley (Ed.), A Survey of Contemporary Economics, Vol. II, Irwin.

Aghevli, Bijan B, et. al. (1990), "The Role of National Saving in the World Economy", Occasional Paper, No.67, International Monetary Fund, March.

Anthony, M.L. and A.J. Hughes (1992), "How Successfully Do We Measure Capital Flight? Empirical Evidence from Five Developing Countries", Journal of Development Studies, Vol. 28, No. 3, April.

Asimakopoulos, A (1986), "Finance, Liquidity, Saving, and Investment", Journal of Post-Keynesian Economics, Vol. IX, No. 1, pp. 79-90.

Atesoglu, H.S. (1993), "Balance of Payments Constrained Growth: evidence from the United States", Journal of Post Keynesian Economics, Summer.

Atesoglu, H.S. (1993-4), "Exports, Capital Flows, Relative Prices and Economic Growth in Canada", Journal of Post Keynesian Economics, Winter.

Bacha, E.L. (1992), "External Debt, Net Transfers and Growth in Developing Countries", World Development, Vol. 20, No. 8, August.

Bairam, E. (1988), "Balance of Payments, the Harrod Foreign Trade Multiplier and Economic Growth: The European and North American Experience, 1970-85", Applied Economics, December.

Bairam, E. (1990), "The Harrod Foreign Trade Multiplier Revisited", Applied Economics, June.

Bairam, E. and G. Dempster (1991), "The Harrod Foreign Trade Multiplier and Economic Growth in Asian Countries", Applied Economics, November.

Balassa, Bela (1979), "Export Composition and Export Performance in the Industrial Countries", Review of Economics and Statistics, November.

Balassa, Bela (1989), "The Effects of Interest Rates on Savings in Developing Countries", Policy, Planning and Research Working Papers, No. 56, World Bank, Washington, D.C.

Bank of Jamaica, Annual Reports, various issues.

Bank of Jamaica (1985), The Central Bank and the Jamaican Economy, 1960 - 1985, Bank of Jamaica..

Barclay, C. (1978), "Competition and Financial Crises - Past and Present", in C. Barclay, E.P.M Gardener and J. Revell, Competition and Regulation of Banks, University of Wales Press, Cardiff.

Beckerman, P. (1988), "The Consequences of 'Upward Financial Repression'", International Review of Applied Economics, Vol. 2, No. 1, June, pp. 233-249.

Bencivenga, V.R. and B.D. Smith (1992), "Deficits, Inflation, and the Banking System in Developing Countries: The Optimal Degree of Financial Repression", Oxford Economic Papers, Vol. 44, New Series, pp. 235-258; Old Series, pp. 767-790.

Bennett, K. (1988), "External Debt, Capital Flight, and Stabilisation Policies. The Experiences of Barbados, Guyana, Jamaica and Trinidad and Tobago", Social and Economic Studies, Vol. 37, No. 4, December, pp. 57-77.

Best, Lloyd and Alister McIntyre (1961), "A First Appraisal of Monetary Management in Jamaica", Social and Economic Studies, Vol. 10, No. 3, September, pp. 353-363.

Blaug, Mark (1985), Economic Theory in Retrospect, Cambridge University Press, Cambridge.

Blejer, M.I. and M.S. Khan (1984), "Government Policy and Private Investment in Developing Countries", IMF Staff Papers, Vol. 31, No. 2, June, pp. 379-403.

Borensztein, Eduardo, José De Gregorio and Jong-Wha Lee (1994), "How Does Foreign Direct Investment Affect Economic Growth?", IMF Working Paper (No. WP/94/110, IMF, Washington, D.C.

Boskin, Michael (1978), "Taxation, Saving, and the Rate of Interest", Journal of Political Economy, Vol. 86, No. 2, Part (ii), April, pp. S3-S27.

Bourne, Compton (1988a), "Financial Deepening, Domestic Resource Mobilisation and Economic Growth: 1953-1982", in C. Bourne and Ramesh Ramsaran (Eds.), Money and Finance in Trinidad and Tobago, Kingston, Institute of Social and Economic Research.

Bourne, Compton (1988b), "Financial Deepening, Domestic Resource Mobilisation and Economice Growth: Jamaica 1955-1982", in Antonio Jorge and Salazar-Carillo Jorge (Eds.), Foreign Investment, Debt and Economic Growth in Latin America, London, Macmillan.

Bourne, Compton (1989), "Some Fundamentals of Monetary Policy in the Caribbean", Social and Economic Studies, Vol. 38, No. 2, pp. 265-290.

Bourne, C. and R.O. Singh (1988), "External Debt and Adjustment in Caribbean Countries", Social and Economic Studies Vol. 37, No. 4, December, pp. 107-136.

Boyd, Derick A.C. (1988), Economic Management, Income Distribution, and Poverty in Jamaica, Praeger, New York.

Brown, Adlith (1981), "Economic Policy and the IMF in Jamaica", Social & Economic Studies, Vol. 30, No. 4, December, pp. 1-51.

Brown, Vivian Edward (1986), Testing a Monetarist Model of Inflation: Case Study of Jamaica, M.A. Dissertation, University of Kent at Canterbury, UK.

Bruno, M. & William Easterly (1995), "Inflation Crises and Long-Run Growth", World Bank, Unpublished.

Buffie, E.F. (1984), "Financial Repression, the New Structuralists and Stabilization Policy in Semi-Industrialized Economies", Journal of Development Economics, Vol. 14, No. 3, April, pp. 305-322.

Bullock, Colin (1986), "IMF Conditionality and Jamaica's Economic Policy in the 1980's", Social and Economic Studies, Vol. 35, No. 4, pp. 129-176.

Burkett P. and A.K. Dutt (1991), "Interest Rate Policy, Effective Demand and Growth in LDCs", International Reveiw of Applied Economics, Vol. 5, No. 2, pp. 127-154.

Cameron, Rondo (1962), "Theoretical Bases of a Comparative Study of the Role of Financial Institutions in the Early stages of Industrialization", 2nd International Conference of Economic History, Aix-en-Provence.

Cameron, Rondo (with the collaboration of Olga Crisp, Hugh T. Patrick and Richard Tilly) (1967), "Banking in the Early Stages of Industrialization", Oxford University Press.

Cameron, Rondo (1970), "Banking and Credit as Factors in Economic Growth", Fifth International Conference of Economic History (Volume IV, Money and Credit), Leningrad, Mouton Publishers.

Cameron, Rondo (ed.) (1972), Banking and Economic Development: Some Lessons of History, Oxford University Press.

Chandavarkar, Anand (1990), "Macroeconomic Aspects, Foreign Flows and Domestic Savings Performance in Developing Countries: A 'State of the Art' Report", OECD.

Chenery, H.B. and A. Strout (1966), "Foreign Assistance and Economic Development", American Economic Review, September.

Chenery, H.B. and A. Strout (1979), "Foreign Assistance and Economic Development", Structural Change and Development Policy, Oxford University Press.

Cho Yoon Je (1986), "Inefficiencies from Financial Liberalization in the Absence of Well-Functioning Equity Markets", Journal of Money, Credit and Banking, Vol. 18, No. 2, May, pp. 191-199.

Cho Yoon Je (1989), "Finance and Development: The Korean Approach", Oxford Review of Economic Policy, Vol. 5, No. 4, pp. 88-102.

Cho, Yoon Je (1990), "Mc. Kinnon-Shaw versus the Neo-Structuralists on Financial Liberalisation: A Conceptual Note", World Development, Vol. 18, No. 3.

Cho Yoon Je and D. Khatkhate (1989), "Financial Liberalisation: Issues and Evidence", Economic and Political Weekly, Vol. XXIV, No. 20, May 20th, pp. 1105-1114.

Clark, J.M (1935), Strategic Factors in Business Cycles, National Bureau of Economic Research, New York.

Collier, P. and C. Mayer (1989), "The Assessment: Financial Liberalization, Financial Systems and Economic Growth", Oxford Review of Economic Policy, Vol. 5, No. 4, Winter, pp. 1-12.

Cordon, W. Max (1986), "The Relevance for Developing Countries of Recent Developments in Macroeconomic Theory", Discussion Paper, Development Policy Issues Series, The World Bank, June.

Crafts, N. (1988), "The Assessment: British Economic Growth Over The Long Run", Oxford Review of Economic Policy, Spring.

Crafts, N. (1990), "British Economic Growth Before and After 1979: A Review of the Evidence", in Crafts, N., B. Duckham and N. Woodward (Eds.), The British Economy Since 1945, Oxford University Press, Oxford.

Cuddington, John T. (1986), Capital Flight, Princeton Studies in International Finance, No. 58.

Danielson, Andero (1993), The Political Economy of Development Finance: Public Sector Expansion and Economic Development in Jamaica, Westview Press.

Davidson, P (1986), "Finance, Funding, Saving and Investment", Journal of Post-Keynesian Economics, Vol. IX, No. 1, pp.101-110.

Davies, Omar (1986), "An Analysis of the Management of the Jamaican Economy: 1972-1985", Social and Economic Studies, Vol. 35, No. 1, March.

Dawson, Christine E. (1992), Financial Repression and Savings Behaviour in the Jamaican Economy, M.A. Dissertation, University of Kent at Canterbury, UK.

de Melo, Jaime and James Tybout (1985-86), "The Effects of Financial Liberalisation on Savings and Investment in Uruguay", Economic Development and Cultural Change, Vol. 34, pp. 561-587.

Diaz-Alejandro, C. (1985), "Goodbye Financial Repression, Hello Financial Crash", Journal of Development Economics, Vol. 19, Nos. 1-2, pp. 1-24.

Dornbusch, Rudiger and Jacob A. Frenkel (1973), "Inflation and Growth: Alternative Approaches", Journal of Money, Credit and Banking, Vol. 5, May, pp. 141-156.

Dornbusch, R. and A. Reynoso (1989), "Financial Factors in Economic Development", Amercian Economic Review Papers and Proceedings, May, pp. 204-209.

Dooley, Michael P. (1988), "Capital Flight: A Response to Differences in Financial Risks", IMF Staff Papers, Vol. 35, No. 3, September, pp. 422-36.

Dooley, Michael P. (1990), "Comment" in Razin A. and J. Slemrod (Eds.), Taxation in the Global Economy, Chicago University Press.

Dutt, A.K. (1991), "Interest Rate Policy in LDCs: A Post Keynesian View", Journal of Post Keynesian Economics, Vol. 13, No. 2, pp. 210-232.

Edwards, S. and A.C. Edwards (1991), Monetarism and Liberalisation: the Chilean Experiment, University of Chicago Press.

Evans, L.T, S.P. Keef, and J. Okunev (1994), "Modelling Real Interest Rates", Journal of Banking and Finance, Vol. 18, No. 1, January, pp. 153-165.

Findlay, R. and Stanislaw Wellisz (Eds.) (1993), The Political Economy of Poverty, Equity and Growth: Five Small Open Economies, World Bank and Oxford University Press.

Friedman, Milton (1971), "Government Revenue from Inflation", Journal of Political Economy, Vol. 79, No. 4, July-August, pp. 846-856.

Fry, M.J. (1978), "Money and Capital or Financial Deepening in Economic Development", Journal of Money, Credit and Banking, Vol.10, No. 4, November, pp. 464-475

Fry, M.J. (1979), "The Cost of Financial Repression in Turkey", Savings and Development, Vol. 3, No.2, pp.127-135.

Fry, M.J. (1980), "Saving, Investment, Growth and the Cost of Financial Repression", World Development, Vol. 8, No. 4, pp. 317-327.

Fry, M.J. (1981), Interest Rates in Asia: An Examination of Interest Rate Policies in Burma, India, Indonesia, Korea, Malaysia, Nepal, Pakistan, the Philippines, Singapore, Sri Lanka, Taiwan and Thailand, Asian Dept, International Monetary Fund, Washington, D.C., June.

Fry, M.J. (1988), Money, Interest, and Banking in Economic Development, The Johns Hopkings University Press.

Fry, M.J. (1995), Money, Interest, and Banking in Economic Development, (2nd Ed.), The Oxford University Press.

Fry, M.J. (1996), "Financing Economic Reform: Mobilizing Domestic Resources and Attracting the Right Kind of External Resources", Department of Economics Discusion Paper No. 96-20, University of Birmingham.

Galbis, V. (1977), "Financial Intermediation and Economic Growth in Less-Developed Countries: A Theoretical Approach", Journal of Development Studies, Vol. 13, No. 2, pp 58-72.

Galbis, V. (1982), "Analytical Aspects of Interest Rate Policies in Less Developed Countries", Savings and Development, Vol. 6, No. 2, pp. 111-165.

Gavin, Michael (1990), "Jamaica: Can Recovery Be Sustained?", in F. Desmond McCarthy (ed.), Problems of Developing Countries in the 1990s, Volume II: Country Studies, World Bank Discussion Paper No. 98.

Ghatak Subrata (1981), Monetary Economics in Developing Countries, Macmillan.

Gibran, Joan Marie (1986), Foreign Debt and Economic Development: The Case of Jamaica, 1972-1982, M.A. Dissertation, University of Kent at Canterbury, UK.

Gibson, Heather D. and Euclid Tsakalotos (1994), "The Scope and Limits of Financial Liberalisation in Developing Countries: A Critical Survey", Journal of Development Studies, Vol. 30, No.3, April, pp. 578-628.

Gibson, H. and E. Tsakalotos (1990), "Capital Flight and Financial Liberalisation: A Study of Five European Countries", Studies in Economics, No. 90/91, University of Kent at Canterbury, UK.

Giovannini, A. (1983), "The Interest Elasticity of Savings in Developing Countries: The Existing Evidence", World Development, Vol. 11, No. 7, July, pp. 601-607

Giovannini, A. (1985), "Saving and the Real Interest Rate in LDC's", Journal of Development Economics, Vol.18, Nos. 2-3, pp. 197-217.

Goldsmith, R.W. (1955), "Financial Structure and Economic Growth in Advanced Countries", in M. Abramovitz, (ed.), Capital Formation and Economic Growth, Princeton University Press, Princeton, NBER.

Goldsmith, R.W. (1958), Financial Intermediaries in the American Economy Since 1900: A Study by the National Bureau of Economic Research, Princeton University Press, New York.

Goldsmith, R.W. (1966), The Financial Development of Mexico, Development Centre Studies, OECD, Paris.

Goldsmith, R.W. (1968), Financial Institutions, Random House, New York.

Goldsmith, R.W. (1969), Financial Structure and Development, Yale University Press, New Haven.

Goldsmith, R .W. (1983), The Financial Development of Japan, 1868 - 1977, Yale University Press.

Gonzales Arietta, Gerardo M. (1988), "Interest Rates, Savings, and Growth in LDCs: An Assessment of Recent Empirical Research", World Development, Vol. 16, No. 5, pp. 589-605.

Goodhart, C.A.E (1989), Money, Information and Uncertainty, Macmillan.

Government of Jamaica, Statistical Abstract, various issues.

Government of Jamaica (1960-1992), Economic and Social Survey of Jamaica.

Griffin, K. (1970), "Foreign Capital, Domestic Savings and Economic Development", Bulletin of Oxford University Institute of Economics and Statistics, Vol. 32, No. 2, May.

Gulley, O.D. (1994), "An Empirical Test of the Effects of Government Deficits on Money Demand", Applied Economics, Vol. 26, No. 3, March, pp. 239-247.

Gupta, K.L. and M.A. Islam (1983), "Foreign Capital, Savings, and Growth", International Studies in Economics and Econometrics, Vol. 9, Reidel, Holland.

Gupta, K.L. (1987), "Aggregate Savings, Financial Intermediation, and Interest Rate", Review of Economics and Statistics, Vol. 69, No. 2, pp. 303-311

Gurley, John G. (1969), "Financial Structures in Developing Economies", in D. Krivine (ed.), Fiscal and Monetary Problems in Developing States, Praeger.

Gurley, John G. and E.S. Shaw (1955), "Financial Aspects of Economic Development", American Economic Review, Vol. 45, No. 4, September, pp. 515-538.

Gurley, John G. and E.S. Shaw (1956), "Financial Intermediaries and the Saving-Investment Process", Journal of Finance, Vol. XI, No. 2, pp. 257-276.

Gurley, John G. and Edward S. Shaw (1960), Money in a Theory of Finance, The Brookings Institution.

Hanson, James A. and Craig R. Neal (1986), Interest Rate Policies in Selected Developing Countries, 1970-82, IBRD, Industry and Finance Series, Vol. 14.

Harris, L. (1988), "Financial Reform and Economic Growth: A New Interpretation of South Korea's Experience", in L. Harris, J. Coakley, M. Croasdale and T. Evans (Eds.), New Perspectives on the Financial System, Croom Helm, London.

Harrod, Roy F. (1933), International Economics, Cambridge University Press, Cambridge.

Horiuchi, Akiyoshi (1984), "The 'Low Interest Rate Policy' and Economic Growth in Postwar Japan", Developing Economies, Vol. 22, No. 4, December, pp. 349-371.

Horiuchi, Akiyoshi (1992), "Financial Liberalisation: The Case of Japan", in Dimitri Vittas (Ed.), Financial Regulation: Changing the Rules of the Game, (Chapter 4, Part III: Issues in Financial Liberalisation), World Bank, Washington , D.C.

Hope, Kempe Ronald (1986), Economic Development in the Caribbean, Praeger, New York.

Host-Madsen, Poul (1979), "Macroeconomic Accounts: An Overview", Pamphlet Series, No. 29, International Monetary Fund, Washington, D.C.

Howells, Peter G.A. (1995), "The Demand for Endogenous Money", Journal of Post Keynesian Economics, Vol. 18, No. 1, Fall, pp. 89-106.

Hughes, A. (1986), "Investment Finance, Industrial Strategy, and Economic Recovery", in P. Nolan and S. Paine (Eds.), Rethinking Socialist Economics, Oxford, Polity Press.

Hussain, M.N. (1995), The Balance of Payments Constraints and Growth Rate Differences Among African and East Asian Economies, African Development Bank.

IMF Institute (1981), Financial Policy Workshops: The Case of Kenya, International Monetary Fund, Washington , D.C.

IMF Institute (1988), A Simulation Model for Financial Programming, International Monetary Fund.

International Monetary Fund (1960-1995), International Financial Statistics Yearbook, IMF, Washington, D.C.

International Monetary Fund (1960-1990), International Financial Statistics, Electronic Databank, Manchester Computing Centre, University of Manchester.

International Monetary Fund (1983), "Interest Rate Policies in Developing Economies", Occasional Paper, No. 22, IMF.

Jefferson, Owen (1972), The Post War Economic Development of Jamaica, Institute of Social and Economic Research, University of the West Indies, Jamaica.

Jung, Woo S. (1986), "Financial Development and Economic Growth: International Evidence", Economic Development and Cultural Change, Vol. 34, No. 2, January, pp. 333-346.

Kapur, B.K. (1976), "Alternative Stabilization Policies for Less-Developed Economies", Journal of Political Economy, Vol. 84(4,i), August, pp. 777-795.

Kapur, B.K. (1983), "Optimal Financial and Foreign-Exchange Liberalization of Less Developed Economies", Quarterly Journal of Economics, Vol. 98, No. 1, pp. 41-62.

Kennedy, C. and A.P. Thirlwall (1971), "Foreign Capital, Domestic Savings and Economic Development: A Comment", Bulletin of the Oxford University Institute of Economics and Statistics, Vol. 33, No. 2, May.

Kennedy, C. and A.P. Thirlwall (1979), "Import Penetration, Export Performance and Harrod's Trade Multiplier", Oxford Economic Papers, Vol. 31, No. 2, July.

Keynes, J.M. (1936), The General Theory of Employment, Interest and Money, Macmillan.

Keynes, J.M. (1937), "Alternative Theories of the Rate of Interest", Economic Journal, Vol. 47, No. 186, June, pp. 241-252.

Keynes, J.M. (1939), "The Process of Capital Formation", Economic Journal, September, pp. 569-574.

Khan, Mohsin S. and Nadeem Ul. Haque (1985), "Foreign Borrowing and Capital Flight: A Formal Analysis", IMF Staff Papers, Vol. 32, No. 4, December, pp. 606-628.

Khan, M. and C. Reinhart (1990), "Private Investment and Economic Growth in Developing Countries", World Development, Vol. 18, No. 1, January.

Khatkhate, D. (1988), "Assessing the Impact of Interest Rates in Less Developed Countries", World Development, Vol. 16, No. 5, pp. 577-588.

King, Robert G. and Ross Levine (1993a), "Finance and Growth: Schumpeter Might Be Right", Quarterly Journal of Economics, Vol. 108(3), August, pp.717-737.

Kohsaka, Akira (1984), "The High Interest Rate Policy Under Financial Repression", Developing Economies, Vol. 22, No. 4, December, pp. 419-452.

Krueger, Anne O. (1987), "Debt Capital Flows, and LDC Growth", American Economic Review, Vol. 77, No. 2, May, pp. 159-164.

Krugman, P. (1989), "Differences in Income Elasticities and Trends in Real Exchange Rates", European Economic Review, May.

Langoni, C.G. and E.C. Kogut (1977), "Development Policies and Problems: The Brazilian Experience" in Brummer, K. and A. Meltzer (Eds.), International Organisations, National Policies and Economic Development, North Holland, Amsterdam.

Leff, Nathaniel H. and Kazuo Sato (1980), "Macroeconomic Adjustment in Developing Countries: Instability, Short-Run Growth, and External Dependency", Review of Economics and Statistics, Vol. 62, No. 2, May, pp. 170-179.

Leibenstein, H (1966), "Incremental Capital-Output Ratios and Growth Rates in the Short Run", Review of Economics and Statistics, Vol.18, No.1, February

Leon, Hyginus (1988), "The Monetary Approach to the Balance of Payments - A Simple Test of Jamaican Data", Social and Economic Studies, Vol. 37, No. 4, December, pp. 1-37.

Levitt, Kari (1991), The Origins and Consequences of Jamaica's Debt Crisis, 1970-1990, Consortium Graduate School of Social Sciences, Jamaica.

Lewis, W Arthur (1955), Theory of Economic Growth, Unwin.

Looney, Robert E. (1986), The Jamaican Economy in the 1980's: Economic Decline and Structural Adjustment.

Massell, B.F., S. Pearson and J. Fitch (1972), "Foreign Exchange and Economic Development: An Empirical Study of Selected Latin American Countries", Review of Economics and Statistics, Vol. 54.

Mathieson, D. J. (1979), "Financial Reform and Capital Flows in a Developing Economy", IMF Staff Papers, September, pp 450-489.

Mathieson, D.J. (1980), "Financial Reform and Stabilization Policy in a Developing Economy", Journal of Development Economics, Vol. 7(3), September, pp. 359-395.

Mayer, C. (1990), "Financial Systems, Corporate Finance and Economic Development", in R.G. Hubbard (Ed.), Asymmetric Information, Corporate Finance, and Investment, NBER, Chicago, University of Chicago Press.

McCombie, J.S.L. (1989), "Thirlwall's Law and Balance of Payments Constrained Growth - A Comment on the Debate", Applied Economics, May.

McCombie, J.S.L. and A.P. Thirlwall (1994), Economic Growth and the Balance of Payments Constraint, Macmillan.

McCombie, J.S.L. and A.P. Thirlwall (1997), "The Dynamic Harrod Foreign Trade Multiplier and the Demand-Oriented Approach to Economic Growth: an evaluation", International Review of Applied Economics, Vol. 11, No. 1, pp. 5-26.

McGregor, P.G. and J.K. Swales (1985), "Professor Thirlwall and Balance of Payments Constrained Growth", Applied Economics, February.

McGregor, P.G. and J.K. Swales (1986), "Balance of Payments Constrained Growth: a rejoinder to Professor Thirlwall", Applied Economics, December.

McGregor, P.G. and J.K. Swales (1991), "Thirlwall's Law and Balance of Payments Constrained Growth: Further Comment on the Debate", Applied Economics, February.

McKinnon, R.I. (1973), Money and Capital in Economic Development, The Brookings Institution, Washington, D.C.

McKinnon, R.I. (1989), "Financial Liberalization and Economic Development: A Reassessment of Interst-Rate Policies in Asia and Latin America", Oxford Review of Economic Policy, Vol. 5, No. 4, Winter, pp. 29-54.

Metzler, Lloyd (1968), "The Process of International Adjustment Under Conditions of Full Employment: A Keynesian View", in Caves, Richard E. and Harry G. Johnson (Eds.), Readings in International Economics, Richard D. Irwin and the American Economic Association.

Modeste, Nelson (1993), "An Empirical Test of the McKinnon Model of Financial Unrepression and Economic Growth: The Experience of Some Caribbean Countries", Social and Economic Studies, Vol. 42, Nos. 2 and 3, June and September 1993, pp. 81-93.

Molho, L.E. (1986), "Interest Rates, Saving and Investment in Developing Countries: a Re-Examination of the McKinnon-Shaw Hypothesis", IMF Staff Papers, Vol. 33, pp. 90-116.

Morisset, J. (1989), "The Impact of Foreign Capital Inflows on Domestic Savings Re-examined: The Case of Argentina", World Development, Vol. 17, No. 11, November.

Morisset, J. (1993), "Does Financial Liberalisation Really Improve Private Investment in Developing Countries?" Journal of Development Economics, Vol. 40, No. 1, February, pp. 133-150.

Mosley, P, J Harrigan and J Toye (1995), Aid and Power: The World Bank and Policy-Based Lending, Vol. I - Analysis and Policy Proposals; Vol. II - Case Studies, Routledge, London

Mundell, Robert A. (1965), "Growth, Stability, and Inflationary Finance", Journal of Political Economy, Vol. 73, No. 2, April, pp. 97-109.

Newlyn, W. (1985), "The Role of the Public Sector in the Mobilisation and Allocation of Financial Resources", in A. Gutowski, A. Amando and H. Scharrer (Eds.), Financing Problems of Developing Countries, Macmillan.

Ortiz, Guillermo and Leopoldo Solis (1979), "Financial Structure and Exchange Rate Experience: Mexico 1954-1977", Journal of Development Economics, Vol .6, No. 4, December, pp.515-548.

Palley, T.I. (1991), "The Endogenous Money Supply: Consensus and Disagreement", Journal of Post Keynesian Economics, Vol. 13, No. 3, pp. 397-403.

Palmer, Ransford W. (1968), The Jamaican Economy, Praeger.

Papaneck, G.F. (1973), "Aid, Foreign Private Investment, Savings and Growth in Less Developed Countries", Economic Journal, Vol. 82, September.

Pastor, M. (1990), "Capital Flight From Latin America", World Develoment, Vol. 18, No. 1, January.

Patrick, H.T. (1966), "Financial Development and Economic Growth in Underdeveloped Countries", Economic Development and Cultural Change, Vol. XIV, No. 2, January, pp. 174-189.

Pesaran, M.H. (1986), "Structural Keynesianism as an Alternative to Monetarism", in P. Nolan and S. Paine (Eds.), Rethinking Socialist Economics, Oxford, Polity Press.

Pesek, Boris P. and Thomas R. Saving (1967), Money, Wealth, and Economic Theory, Macmillan.

Polak, J.J. (1989), Financial Policies and Development, OECD, Paris.

Rajapakse, P. (1994), Causal Factors and Transmission Mechanisms of Inflationary Impulses in Sri Lanka, 1970-1989, PhD Thesis, University of Kent, Canterbury.

Ramsaram, Ramesh (1989), "Capital Movements - The Experience of Commonwealth Caribbean Countries, 1970-1984", in Worrell, De Lisle and Compton Bourne (Eds.), Economic Adjustment Policies for Small Nations: Theory and Experience in the English Speaking Caribbean, Praeger, New York.

Rana, P.B. and J.M. Dowling (1990), "Foreign Capital and Asian Economic Growth", Asian Development Review, Vol. 8, No. 2, pp. 77-102.

Rittenberg, L. (1991), "Investment Spending and Interest Rate Policy: The Case of Financial Liberalisation in Turkey", Journal of Development Studies, Vol. 27, No. 2, January, pp. 151-167.

Robertson, D.H. (1926), Banking Policy and the Price Level: An Essay In The Theory Of The Trade Cycle, P.S. King, London.

Robinson, Michele (1989), "A Review of Monetary Policies in the Jamaican Economy, 1980-1985", in Worrell, De Lisle and Compton Bourne (Eds.), Economic Adjustment Policies for Small Nations: Theory and Experience in the English Speaking Caribbean, Praeger, New York.

Rossi, N. (1988), "Government Spending, the Real Interest Rate, and the Behaviour of Liquidity - Constrained Consumers in Developing Countries", IMF Staff Papers, Vol. 35, pp. 104-140.

Roubini, N. and X. Sala-i-Martin (1992), "Financial Repression and Economic Growth", Journal of Development Economics, Vol. 39, No. 1, July, pp. 5-30.

Rousseas, Stephen (1986), Post Keynesian Monetary Economics, Macmillan.

Sarel, M. (1996), "Non-Linear Effects of Inflation on Economic Growth", IMF Staff Papers, March

Sarmad, K. (1990), "Public and Private Investment and Economic Growth", Working Paper 34, Institute of Social Studies, The Hague, Holland.

Schumpeter, J.A . (1934), The Theory of Economic Development, Harvard.

Schumpeter, J.A. (1939), Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process, Vols. I and II, Mc.Graw-Hill, New York and London.

Scott, M.F.G. (1989), A New View of Economic Growth, Clarendon Press, Oxford.

Scott, M F G (1992), "Policy Implications of A New View of Economic Growth", Economic Journal, Vol. 102, pp. 622-632.

Shaw, Edward S (1973), Financial Deepening in Economic Development, Oxford University Press.

Smith, Adam (1776), An Inquiry into the Nature and Causes of the Wealth of Nations, George Routledge and Son, London (Reprinted, 1900).

Snyder, D. (1990), "Foreign Assistance and Domestic Savings: A Spurious Correlation?", Economic Development and Cultural Change, Vol. 39, No. 1, October.

Soskice, D. (1991), "The Institutional Infrastructure for International Competitiveness: A Comparative Analysis of the UK and Germany", in A.B. Atkinson and R. Brunetta (Eds.), Economics for the New Europe, London, Macmillan.

Stanners, W. (1993), "Is Low Inflation an Important Condition for High Growth?", Cambridge Journal of Economics, March

Stiglitz, J.E. (1989), "Financial Markets and Development", Oxford Review of Economic Policy, Vol. 5, No. 4, Winter, pp. 55-68.

Stiglitz, Joseph E. and Andrew Weiss (1981), "Credit Rationing in Markets with Imperfect Information", American Economic Review, Vol. 71, No. 3, June, pp. 393-410.

Stone, Carl and Stanislaw Wellisz (1993), "Jamaica", in Ronald Findlay and Stanislaw Wellisz (Eds.), The Political Economy of Poverty, Equity, and Growth: Five Small Open Economies, World Bank and Oxford University Press.

Taylor, L. (1981), "IS/LM in the Tropics: Diagrammatics of the New Structuralist Macro Critique", in: W. Cline and S. Weintraub (Eds.), Economic Stabilization in Developing Countries (Brookings Institution, Washington, D.C.).

Taylor, L. (1983), Structuralist Macroeconomics: Applicable Models for the Third World, New York, Basic Books.

Taylor, L. (1991), Income Distribution, Inflation and Growth, MIT Press, Massachusettes.

Taylor, L. (1992), Varieties of Stabilisation Experiences: Towards Sensible Macroeconomics in the Third World, Clarendon Press, Oxford.

Thirlwall, A.P. (1969), "Okun's Law and the Natural Rate of Growth", Southern Economic Journal, July.

Thirlwall, A.P. (1974), Inflation, Saving & Growth in Developing Economies, Macmillan.

Thirlwall, A.P. (1976), Financing Economic Development, Macmillan.

Thirlwall, A.P. (1979), "The Balance of Payments Constraint as an Explanation of International Growth Rate Differences", Banca Nazionale del Lavoro Quarterly Review, March.

Thirlwall, A.P. (1986), "Balance of Payments Constrained Growth: A Reply to McGregor and Swales", Applied Economics, December.

Thirlwall, A.P. (1994, 1989), Growth and Development with Special Reference to developing Economies, Macmillan.

Thirlwall, A.P. and N. Hussain (1982), "The Balance of Payments Constraint, Capital Flows and Growth Rate Differences Between Developing Countries", Oxford Economic Papers, No. 3, November, pp. 498-510.

Thomas, C.Y. (1965), Monetary and Financial Arrangements in a Dependent Monetary Economy, Institute of Social and Economic Research, University of the West Indies, Jamaica.

Thomas, C.Y. (1989), "Foreign Currency Black Markets: Lessons from Guyana", Social and Economic Studies, Vol. 38, No. 2, pp. 137-184.

Toye, John (1987), Dilemmas of Development: Reflections on the Counter-Revolution in Development Theory and Policy, Basil Blackwell, Oxford.

Tun Wai, U. (1956), "Interest Rates in the Organized Money Markets of Underdeveloped Countries", IMF Staff Papers, Vol. 5, August, pp. 249-278.

Tun Wai, U. (1957), "Interest Rates Outside the Organised Money Markets of Underdeveloped Countries", IMF Staff Papers, Vol.6, November, pp. 80-142.

Tun Wai, U. (1967), "Role of the Money Market in Supplementing Monetary Policy", reprinted in U. Tun Wai, Economic Essays on Developing Countries, Sijhoff and Noordhoff, 1980.

Tun Wai, U. (1972), "Household Savings for Development", reprinted in U. Tun Wai, Economic Essays on Developing Countries, Sijhoff and Noordhoff, 1980.

Tun Wai, U. (1976), "Role of Financial Markets in Development", reprinted in U. Tun Wai, Economic Essays on Developing Countries, Sijhoff and Noordhoff, 1980.

Tun Wai U. (1978), "The Optimal Size and Ideal Structure of Financial Markets in Developing Countries", reprinted in U. Tun Wai, Economic Essays on Developing Countries, Sijhoff and Noordhoff, 1980.

Tun Wai, U. and C. Wong (1982), "Determinants of Private Investment in Developing Countries", Journal of Development Studies, Vol.19, No.1, October, pp 19-36.

United Nations (1960-1993), Statistical Yearbook, United Nations.

United Nations (1960-1981), Yearbook of National Accounts Statistics, United Nations.

United Nations (1982-1993), Economic Survey of Latin America and the Caribbean, United Nations, Santiago.

United Nations (1982-1990), National Accounts Statistics: Main Aggregates and Detailed Tables, United Nations.

van Wijnbergen, S. (1983a), "Credit Policy, Inflation and Growth in a Financially Repressed Economy", Journal of Development Economics, Vol. 13, Nos. 1-2, pp. 45-65.

van Wijnbergen, S. (1983b), "Interest Rate Management in LDC's", Journal of Monetary Economics, Vol. 12, No. 3, September, pp. 433-452.

Warman, F. (1993), The Financing of Economic Growth and Development: The Case of Mexico, PhD. Thesis, University of Kent at Canterbury, UK.

Warman, Fanny and A.P. Thirlwall (1994), "Interest Rates, Saving, Investment and Growth in Mexico 1960-90: Tests of the Financial Liberalisation Hypothesis", Journal of Development Studies, Vol. 30, No. 3, April, pp. 629-647.

Weisskopf, T.E. (1972), "The Impact of Foreign Capital Inflows on Domestic Saving in Underdeveloped Countries", Journal of International Economics, Vol. 2.

World Bank (1976, 1987, 1988/89, 1993), World Tables, World Bank and Johns Hopkins University Press.

World Bank (1985), World Development Report, World Bank, Washington, D.C.

World Bank (1986/87 - 1993/94), World Debt Tables, The World Bank, Washington, D.C.

World Bank (1989), World Development Report: Financial Systems and Development, World Bank and Oxford University Press.

World Bank (1994), Trends in Developing Economies, 1994, IBRD, Washington, D.C., p. 239.

Worrell, De Lisle (1987), Small Island Economies: Structure and Performance in the English Speaking Caribbean Since 1970, Praeger, New York.