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FOREIGN CAPITAL INFLOWS AND ECONOMIC GROWTH OF DEVELOPING COUNTRIES: A CRITICAL SURVEY OF SELECTED EMPIRICAL STUDIES

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Economists have always considered capital as the central element of the process of economic development. The straightforward view of development economists is that *capital* is essential for growth and its origin does not matter. Based on this view, the capital-deficient countries heavily resorted to foreign capital as the primary means to achieve rapid economic growth. Unfortunately, the growth experience of many of these countries has not been very satisfactory and, as a result, they accumulated a large external debt and are now facing serious debt servicing problems. This survey attempts to integrate major empirical studies on the macroeconomic effects of foreign capital inflows. It concludes that the results of previous studies have largely been controversial, mainly due to methodological problems and data limitations. Since most of the previous studies are cross-sectional in nature, there is a need for more country-specific case studies, due to the unique characteristics of each country and the stringent conditionalities of debt relief initiatives.

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1. INTRODUCTION

Foreign capital has played a significant role in the process of economic development of many developing countries, but the subject is still highly controversial: whether to review theoretical literature or empirical studies. The debate on the issue dates back to the 1950s when many capital-deficient countries resorted to foreign capital as the primary means to achieve rapid economic growth. Unfortunately, the growth experience of many of these countries has not been very satisfactory. As a result, they accumulated a large external debt and are now facing serious debt servicing problems.

This survey attempts to integrate the major empirical studies on the macroeconomic impact of foreign capital on the economies of the developing countries. It does not, however, discuss the details of the theoretical literature as the same has already been discussed in another survey article by the same author (see Waheed (2004)). Thus, the main objective of this survey is to review a set of empirical studies, explain inconsistent and contradictory findings and summarise the results.

The survey is divided into five sections. Following a brief introduction, Section 2 discusses the empirical findings of the effects of foreign capital on economic growth, domestic savings and investment. Section 3 presents the major empirical studies on debt sustainability analysis and debt overhang. Section 4 highlights the sources of discrepancies in the previous empirical studies. Section 5 summarises the results, provides a conclusion and sets directions for future empirical research.

2. EMPIRICAL STUDIES ON FOREIGN CAPITAL

2.1. Foreign Capital and Economic Growth

Most of the earlier studies examined the direct impact of capital inflows or aid on developing countries' growth in the context of a neoclassical framework, with growth in capital and labor inputs explaining output. However, they disaggregated domestic and imported capital and other variables that aim to capture other aspects of developing-country performance, especially those that are indicative of efficiency in resource allocation. They also disaggregated the foreign capital inflows into its components to assess the most influential flows.

Papanek (1973) disaggregated foreign capital inflows into three principal components: foreign aid, foreign private investment and all other foreign inflows[1]. He used cross section data of 34 countries in the 1950s and 51 countries in the 1960s. He found that all three flows (foreign aid, foreign private investment, and other foreign inflows) had a statistically significant positive impact on growth, and the effect of foreign aid on economic growth was stronger than other factors. In addition to these variables, he also considered the rate of exports, the level of education, and the size of the manufacturing sector, but the effects found were not significant.

Later, Stoneman (1975) tested a new but simple model of the impact of foreign capital on the economic growth of poor countries. He criticised his predecessors for failing to distinguish between two main effects of foreign capital: the direct balance of payments effect (inflows of capital enable higher investment and consumption); and effects on the structure of the economy (foreign inflows reduce exports, change the capital output ratios, affect income distribution, etc). Stoneman performed an Ordinary Least Square (OLS) regression analysis for a five-year period between 1955 and 1970, on a main sample of 188 countries and several sub-samples, using the following explanatory variables: gross domestic savings, net inflow of direct investment, net inflow of foreign aid and other foreign long-term flows, and the stock of foreign direct investment. The dependent variable was annual average growth in GDP. His results confirmed the favorable impact of foreign aid and domestic savings on

[1] Aid was meant as net transfers received by the government plus official long-term borrowing; foreign private investment as private long-term borrowing plus net private direct investment; and other foreign inflows as net private transfers, net short-term borrowing, other capital (net) and errors and omissions in the balance of payments. All explanatory variables were expressed as a percentage of GDP.

economic growth, but suggested that the stock of foreign direct investment retarded growth and that the significance of this increased when the lag of the dependent variable was used.

Balassa (1978) showed in the context of a simple growth model that labor inputs (L), foreign capital inflows (K_f), and capital formation from domestic savings (K_d) were positively related to output growth (Y), using pooled data of ten countries for the period 1960-73[2]. However the effects of foreign capital inflow on output growth were smaller as compared to domestic capital.

Gulati (1978) tried to test the Galbraith hypothesis that objects to categorising all Less Developed Countries (LDCs) into one homogenous block of "Third World" and prescribing the same remedy for each case. He classified 38 LDCs into two categories: Model-I countries were the ones whose development was hampered by the lack of sufficient investment funds, implying that it was only these countries that could use capital inflows to the best advantage. Model-II countries consisted of 21 countries from African and Latin American continents whose development has been hampered by the lack of a minimum cultural base, as in Africa, or the lack of development-oriented social structure, as in Latin America[3].

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[2] K_f was the current account balance during the period in question, expressed as a proportion of initial year GNP, and K_d was the average difference between gross fixed capital formation and current account balance, expressed as a proportion of initial year GNP. L refers to labor force rather than employment.

[3] Model-I countries were: Costa Rica, Egypt, Ghana, India, Indonesia, Iran, Israel, Malaysia, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Sri Lanka, Taiwan, Thailand and Venezuela.

Model-II countries were: Argentina, Bolivia, Brazil, Chile, Colombia, Dominican

Gulati regressed the rate of growth in GDP on all capital inflows and savings in each of the categories of countries for the period of the 1960s. He found that both savings and foreign capital inflows were significantly affecting the rate of growth of incomes in Model-I countries. The same was not true for the culturally and socially-constrained Model-II countries, where these financial variables did not seem to be relevant at all in explaining the growth rates. Thus, Gulati concluded that only some of the LDCs, mostly in Asia, need foreign capital transfers for their development efforts.

Mosley (1980) also disaggregated foreign capital inflows into aid and other financial inflows and lagged foreign aid inflows by five years. With a sample of 83 countries and taking into consideration the period of 1969-77, a Two Stage Least Square (TSLS) regression was performed on a system of two equations. In the first equation, growth (of GDP) was the dependent variable and the explanatory variables were savings, foreign aid, and other foreign capital inflows. In the second equation, foreign aid was the dependent variable and GDP per capita was the explanatory variable. The effect of foreign aid and other inflows on growth was negative but statistically insignificant in the case of all 83 developing countries. For the 30 poorest countries, foreign aid was significantly positive, when lagged by five years.

Dowling and Hiemenz (1983) tried to find the relationship between foreign aid, savings and growth in the presence of policy variables. Their sample covered 52 countries of the Asian region for the period 1968-79. They performed an OLS regression using standard explanatory variables,

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Republic, Ecuador, El Salvador, Guatemala, Honduras, Iraq, Kenya, Morocco, Nicaragua, Paraguay, Peru, Sudan, Syria, Tunisia, Uganda and Uruguay.

i.e. foreign aid, other capital inflows and savings, and four policy variables[4]. All three standard variables were found to be positively and significantly related to economic growth. They reported that economic policies have been conducive to a productive allocation of foreign aid (and other resources), especially in high growth countries of the Asian region. Incorporating various aspects of government policies into the regressions, liberal trade and financial policies were considered as means of improving overall growth performance in the case of high growth countries. Liberal trade policies were considered even more important in explaining income growth in slow growing countries together with improvements in government tax revenues.

Gupta and Islam (1983) used data for 52 developing countries for the period of the 1970s, making three income groups and three geographical regions. They specified a nine-equation simultaneous model and estimates were obtained using both OLS and TSLS methods. However, the TSLS estimates for the two groupings were not encouraging based on usual statistical criteria. Therefore, they reported only the OLS results. Their major finding was that domestic savings as well as foreign capital made a significant contribution to economic growth but that the former was relatively more important than the latter. The disaggregation of foreign capital into foreign aid and foreign private investment suggested a slight advantage of foreign aid over foreign private investment but encountered a trade-off. While foreign private investment had a less

[4]The four policy variables were: (i) the degree of openness of the economy (expressed by exports plus imports as a proportion of GDP); (ii) the role of government in domestic resource mobilisation (measured by central government tax revenue as a percentage of GDP); (iii) the share of the public sector in economic activities (measured by total government expenditure in GDP); and (iv) a measure of "financial repression" (M_2 over GDP) (Dowling and Hiemenz 1983, p.11).

adverse effect on domestic savings than aid, foreign aid was found to be a more significant contributor to growth.

In 1987, Mosley continued his study on foreign aid. As in his previous study (Mosley 1980), he (1987) chose to lag aid and other foreign inflows, but this time for a period of seven years (rather than five). His analysis included OLS, TSLS, and the Cochrane-Orcutt iterative procedure for the period 1960-83. For the entire sample of 67 countries and for sub-samples, the OLS results showed that the relationship between foreign aid and economic growth was not significant. Only export growth remained significant throughout the period. Under both TSLS (where aid is also a function of growth) and the Cochrane-Orcutt iterative method of estimation, aid flows remained insignificant as a determinant of GNP growth.

In another study, Mosley, Hudson, and Harrell, (1987) using a cross-country specification reminiscent of Balassa (1978), found no significant statistical relationship between GNP growth and aid as a percentage of GNP for 81 developing countries for the period 1960-83. There was little improvement in the results when various subgroups were used. A positive relationship (statistically significant at 5 percent level) was shown for Asia in the 1970s and early 1980s, while a negative relationship for all developing countries was present in the 1960s. They also found that export growth was the only factor that seemed to be consistently strongly correlated with developing-country performance.

Shabbir and Azher (1992) employed a two-equation simultaneous model for economic growth and savings ratio (National savings as a ratio of GNP) using annual time series data for Pakistan for the period 1959-60 to 1987-88. The model was estimated by the TSLS method. Their results

showed that foreign private investment exerted a significant positive effect on economic growth measured by GNP growth rate when total disbursements were excluded. However, this positive impact became insignificant when total foreign disbursements were included. The impact of foreign private investment on national savings turned out to be negative and significant in both cases, i.e. with and without foreign disbursements. They also found that disbursement of grants, external loans, savings ratio and exports of goods and services as a ratio of GNP had a positive impact on the growth rate but the estimated coefficients were statistically insignificant.

Khan and Rahim (1993) also attempted to estimate the impact of foreign assistance on the economic development of Pakistan. They employed a single-equation model for estimating savings and economic growth functions for the period 1960 to 1988. They also separated different types of foreign capital and estimated their effects on GNP growth and savings rate using the OLS method. They came up with a negative (but insignificant) impact of foreign assistance on savings and held that different types of foreign capital had different effects. For example, foreign aid in outright grants was found to have no measured effect on savings, foreign direct investment was inversely related to savings (but the size of its co-efficient was insignificant) and loans were negatively related to domestic savings, (but with a significant coefficient). Their second equation produced a significant positive effect of foreign capital assistance (one year lagged) on the growth rate of GNP. The effects of foreign loans and grants were also positive on economic growth but the latter was statistically insignificant.

Iqbal (1994) analysed the impact of structural adjustment lending on real output growth in Pakistan for the period 1979-91. The OLS results

showed that real output growth declined with the availability of adjustment lending and deterioration in the terms of trade, while favourable weather and real domestic savings growth produced positive effects on real GDP growth. Iqbal (1995), in another study, used a three-gap model to examine macroeconomic (foreign exchange, fiscal and savings) constraints to Pakistan's economic growth over the period 1977-92. The OLS results showed that higher capacity utilisation increased both private and public savings; real devaluation reduced the current account deficit; public investment crowded out private investment and growth in foreign demand stimulated economic activity. The results of the foreign exchange constraint equation showed that real devaluation and growth in foreign demand allowed an accelerated growth rate of real GDP in Pakistan.

Iqbal and Zahid (1998) used a multiple regression framework to separate out the effects of key macroeconomic factors on the economic growth of Pakistan over the period 1959-60 to 1996-97. The quantitative evidence from the OLS regression showed that human capital (proxied by primary school enrolment as a ratio of labor force) was an important prerequisite for accelerating growth. The empirical results also suggested that the openness of the economy promoted economic growth[5]. The budget deficit and external debt were found to be negatively related to economic growth. They suggested that relying on domestic resources was the best alternative to finance growth.

[5] The exports of goods as a ratio of GDP and imports of goods as a ratio of GDP were taken separately to represent the openness of the economy.

Bowen (1998) tried to measure the direct and indirect relationships between foreign aid and economic growth using a cross-country data for 67 less-developed countries for the average of variables for the period 1970-88. The direct aid-growth relationship was not significant, nor were most direct relationships in the model. However, indirect aid-growth relationship, via its interaction with domestic savings, was significant and negative. To determine the most appropriate explanation of the results, a TSLS regression analysis was applied to a system of equations modeling the aid-savings relationship. The results showed that low per-capita income, rather than low savings rate, led to high aid levels.

Burnside and Dollar (2000) estimated a model using a panel data for 56 countries. They used the TSLS method to estimate simultaneous equations model for growth, aid, and policy[6]. By making identifying assumptions about the exogenous determinants of aid, policy and growth, they determined the separate effects of aid and policy on growth. They found that foreign aid had a robust positive impact on economic growth in a good policy environment. When they entered foreign aid directly into their model, it was not significant. However, it was significant when interacted with the policy index. Foreign aid was found skewed towards poorly growing countries when interacted with population and donor interest variables.[7]

In a more recent study, Hansen and Tarp (2001) examined the

[6] Explanatory variables were: an index of institutional quality, ethnic fractionalisation, the frequency of assassinations, and inefficiency of the financial system. Policy variables were: trade openness, inflation, share of budget surplus in GDP and share of government consumption in GDP.

[7] To capture donors' strategic interest, Burnside and Dollar used dummies for Sub-Saharan Africa, Egypt and Central America and a measure of arms imports lagged one period.

relationship between foreign aid and growth in real GDP per capita. The average rate of growth of GDP in 56 countries covering the years 1974-1993 in five periods was regressed on several policy and institutional control variables and foreign aid. Their results showed that foreign aid in all likelihood increased the growth rate, and this was not conditional on “good” policy (as suggested by Burnside and Dollar (2000)). They, however, found decreasing returns to foreign aid, and the estimated effectiveness of foreign aid was highly sensitive to the choice of estimator and the set of control variables.

Table 1 summarises the results of selected studies on the relationship between foreign capital and economic growth. It reveals that in most cases the empirical studies found a positive relationship between foreign capital and economic growth of developing countries.

Table 1: Impact of Foreign Capital on Growth: Results of Selected Studies

Study	Sample size and Period	Methodology	Dependent Variable	Explanatory Variable(s)	Significant Var.	Sign.
Papanek (1973)	34-LDCs 1955-65	OLS	Y	S, A, I, OI	All	+
Stoneman (1975)	188 Countries 1955-70	OLS	Y	A, S, I, IS	IS S, A	- +
Balassa (1978)	1960-73	OLS	Y	K_d, K_f, L	All	+
Dowling and Hiemenz (1983)	52-Asian 1968-79	OLS	Y	A, S, I, and Four policy variables	A, S, I	+
Mosley (1987)	67-Countries 1960-83	OLS 2SLS	Y A	A, S, I, L, E Y	E	+
Bowen (1998)	67-LDCs 1970-1988	OLS 2SLS	Y S	S, A, I, E A, I	E, S A	- -

Source: As shown in the first column of the table. Note: S=Savings, Y=GNP, GDP Growth rate, K_d=domestic capital, K_f=foreign capital, L=labor force, A=Aid, I=foreign private investment, IS=Investment stock, OI=other inflows, E= Exports.

2.2. Foreign Capital and Domestic Savings

One of the first studies of aid-savings relationship was made by Rahman (1968) who adopted an earlier suggestion by Haavelmo that domestic savings was not only a function of income alone but was also related inversely to foreign aid (the so-called Haavelmo hypothesis). Rahman used cross-section data for 31 less-developed countries in 1962 and ran an

OLS regression of savings ratio on the ratio of capital inflows to GNP. He maintained that Haavelmo's hypothesis might be right concluding that governments in developing countries may "voluntarily relax domestic savings efforts when more aid is available than otherwise[8]".

Griffin (1970), using data from 32 LDCs for the period 1962-64 and estimating a simple model employing the OLS technique, also found a negative relationship between foreign aid and domestic savings[9]. However, he used the current account deficit as a measure of foreign capital and estimated gross domestic savings as the difference between gross domestic investment and the capital account balance. Hasan (2002) later argued that Griffin's regression results were based on an identity rather than a behavioral equation. Consequently, using data derived from an *ex post* accounting relationship tends to yield a biased and spurious negative correlation and regression coefficient. Similarly, as argued by Papanek (1972), a current account deficit can be financed by various ways, such as foreign aid, foreign private investment, short-term capital borrowing, change in foreign exchange reserves, liquidation of private assets abroad, and even errors and omissions. Treating the current account deficit as foreign aid serves as a poor proxy.

Furthermore, Papanek (1972) also argued that an inverse relationship between domestic savings and aid shown in many statistical researches might be grossly misleading. His objections to the previous studies stemmed from his: (a) mistrust of the data used to generate the results; (b) dissatisfaction with the specifications of the econometric models, and most importantly; (c) disagreement on the fact that the regressions could prove anything in a casual sense. He argued that the observation of a

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[8] See Rahman (1968), p.137.

[9] See also Griffin and Enos (1970) for further discussion on the negative effects of foreign aid on domestic savings.

negative correlation says nothing about causation. It was possible that high aid inflows per capita and low average savings propensities were both caused by some third exogenous factor, such as: (a) periods of war or political crisis; (b) changes in the terms of trade; and (c) climatic or other exogenous shocks. However, Papanek (1973)'s own analysis confirmed the negative association between savings and aid. But he, at some pain, wanted to minimise its significance, partly because of the above reasons and partly because of the fact that savings had to be calculated through the conventional accounting relationship (S= I–F). Therefore, he argued that this negative relationship was more likely to be the result of exogenous factors affecting both rather than a causal relationship.

Weisskopf (1972a) also tested the hypothesis that the level of domestic savings in underdeveloped countries was behaviorally related not only to the level of national income but also to the level of net foreign capital inflow. He criticized Rahman (1968) and Griffin and Enos (1970) for not excluding from the regression those countries for which there was a net outflow of capital. This is because when the flow of capital is outward, one would expect the causality to run from domestic capital to the capital flow. The second criticism was that they did not address the question of whether the level of domestic savings observed in each country reflected an *ex ante* behavioral function or merely an *ex post* accounting relationship. Weisskopf (1972a)'s empirical results from the time series data for at least seven years for 44 underdeveloped countries showed a negative impact of foreign capital inflows (proxied with trade deficit) on domestic savings[10]. He concluded that approximately 23 percent of net foreign capital inflow substituted for domestic savings. He

[10] Weisskopf (1972)'s model consisted of seven equations based on standard macroeconomic relationship and embodying two independent constraints on growth that have been emphasised in a two-gap model.

further elaborated that the negative impact of foreign capital inflow applied to ex ante savings but not to ex post savings.

Mead Over (1975) criticised the Griffin-Enos approach that aid donations were not determined by the gap between savings and investment but rather according to the donor interests. Over (1975) found this assumption to be naïve and concluded that their use of OLS was inappropriate because foreign aid was not independent of the error term. Over (1975) replicated the Griffin-Enos study, using almost the same data but assuming foreign aid as endogenous in a simple system of two equations. In the first equation, the ratio of foreign savings to GNP was regressed on the ratio of investment to GNP. In the second equation, the ratio of domestic savings to GNP was regressed on the theoretical values of foreign aid[11]. Using data for thirty-six developing countries for the two year-period of 1962-64, he obtained a significant positive relationship between foreign aid and domestic savings (that is, aid supplemented rather than substituted domestic savings).

Bowles (1987) attempted to address the issue of causal relationship between foreign aid and domestic savings, applying the bivariate Granger causality tests to the annual data related to 20 countries over the period 1960-1981. He found mixed results. In half of the 20 countries, time series data did not indicate any causal relationship between foreign aid and domestic savings. In three cases, domestic savings caused aid, in five cases, aid caused domestic savings and in two cases, there was a feedback between foreign aid and domestic savings in the Granger sense.

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[11] The theoretical values of foreign aid were calculated as: $f = i - s$, where f is the aid rate (Foreign aid as a ratio of GNP), i the investment rate (Total investment as a ratio of GNP), and s the savings rate (Gross domestic savings as a ratio of GNP).

Analyses of the aid-savings relationship for the same countries over time have provided a somewhat greater insight into the factors involved. Pakistan's experience with foreign aid during the period 1951-70, discussed by Islam (1972), throws some light on the apparent instability of aid-savings relationships in developing countries. Essentially, Islam (1972) concluded that the major influences on savings rate over time were due to institutional reforms, changes in the terms of trade, and the government's fiscal policy rather than the volume of foreign aid.

Levy (1984) estimated a model for Egypt in which foreign aid could increase investment and, thus, through a production function, increase output, leading to higher income. Despite this feedback effect, his empirical estimates suggested that the displacement effect of foreign aid on public savings was large. However, he did not look at the dynamic aspects of his model, that is, the possibility that future savings may be higher despite current displacement.

As stated earlier, Bowen (1998) also conducted a study to measure the direct and indirect relationship between foreign aid and economic growth using a cross-country data for 67 less-developed countries for the average of variables for the period 1970-88. His model uncovered an indirect aid growth relationship via its interaction with domestic savings, which was significant and negative.

Razzaque and Ahmed (2000) performed a time-series study (1973–1998) to re-examine the relationship between foreign aid and domestic savings for the Bangladeshi economy using the Cointegration technique. The study found a negative long-run relationship between domestic savings and foreign aid. The short-run relationship between these two variables was also significantly negative. However, the

estimated coefficient of foreign aid from different techniques varied quite markedly.

Table 2: Selected Empirical Studies on Aid-Savings Nexus

Study	Sample size and Period	Metho-dology	Dependent Variable	Explanatory Variable(s)	Significant Var.	Sign.
Rahman (1968)	31-LDCs 1962	OLS	SAV	TFCI	TFCI	"—"
Griffin (1970)	32-LDCs 1962-64	OLS	SAV	AID	AID	"—"
Weisskopf (1972)	44-LDCs 1953-66	TSLS	SAV	TD (7 equations model)	TD	"—"
Over (1975)	36-LDCs 1962-64	TSLS	AID SAV	INV AID	AID	"+"
Bowen (1998)	67-LDCs 1970-1988	TSLS	GNPGR SAV	SAV, AID, FINV, EXP, AID	EXP, SAV AID	"+" "—"
Razzaque and Ahmed (2000)	1973-1998	OLS	PCS	PCGDP, PCA	PCA	"—"
Waheed (2003)	1972-2001	OLS	GDS	GDP, AID	GDP, FA	"+"

Source: As shown in the first column of the table. Note: OLS=Ordinary Least Square, SAV= Savings, TFCI=Total Foreign Capital Inflow, LDCs=Less Developed Countries, TD=Trade Deficit, TSLS=Two Stage Least Square, AID=Foreign Aid, FINV=Foreign Investment, EXP=Exports, PCS=Per capita Savings, GDP=Gross Domestic Product, PCGDP=Per Capita GDP, PCA=Per Capita Aid, INV=Total Investment.

A study by the same author (see Waheed (2003)) identified certain limitations of the previous studies on the aid-savings relationship. These were: misspecification of the savings function, use of cross-section data and less attention to time series econometrics in time series studies. Waheed (2003) used the time series data of Pakistan and paid due attention to standard time series econometric techniques, which were ignored by most of the previous studies. The use of three Cointegration tests (CRDW[12], Engle-Granger and Johansen-Juselius) confirmed the existence of a significant long-run positive relationship between domestic savings and foreign aid. The bivariate (Granger and Sims tests) and

[12] CRDW denotes Cointegrating Regression Durbin Watson test.

trivariate (Granger test) causality analyses also confirmed a significant positive bi-directional causality between foreign aid and domestic savings in Pakistan.

Table 2 summarises the results of selected studies on aid-savings nexus. It reveals that in most cases the empirical studies were cross-sectional, and found a negative relationship between foreign capital and domestic savings.

2.3. Foreign Capital and Domestic Investment

There were a few attempts to relate foreign aid to capital formation in developing countries. Halevi (1976) examined the relationship between long-term capital inflows in aggregate capital formation and in its components, private and public investment and consumption, for forty-four countries in the late 1960s. When all variables were expressed in per capita terms, he found a positive and significant relationship between long-term capital (aggregate) and private and public capital inflows and investment. He also found that long-term capital was positively related to public consumption and negatively related to private consumption. He concluded that there was a significant link between long term capital inflow, investment and growth but stated that such capital inflow also tended to increase public consumption.

Levy (1987) argued that foreign aid falls into two general categories. A part of foreign aid is more unanticipated, transitory and of “relief” nature, such as drought-related food transfer, medical and refugee relief, and balance of payments crisis support, which can be considered to augment consumption. The second category of aid is mainly intended for development purposes, is more permanent, and is anticipated from previously negotiated commitments by donors. Using a

cross-country data for fifty-nine countries for the period 1968-80, he concluded that most of the anticipated foreign transfer tends to be invested[13].

Mosley (1987) found a positive relationship between foreign aid and private investment. Bhalla (1991) estimated a simple investment-growth model for Sri Lanka for the period 1956-86 and found a positive relationship. Snyder (1996) evaluated the relationship between foreign aid and private investment using annual panel data for 36 developing countries over the period 1977-1991. He found a negative relationship which was robust to various specifications and estimation techniques. The explanation offered by Snyder for these results was the discouragement of private investment, as Dutch disease [14] effects undermined domestic competitiveness. He also noted that some types of aid, such as those for the support of infrastructure, would have a less adverse effect than other types of foreign aid.

The discussion on this section can be summarised by referring to an analysis of 131 empirical studies by Hansen and Tarp (2000) which looked at the effects of foreign aid on savings, investment and growth. They classified 131 regression results into two groups. In the first group, with a total of 104 regressions, the explanatory variables included a clearly identified measure of aid (A), roughly equivalent to the DAC (Development Assistance Committee) concept of official development assistance (ODA). The remaining 27 studies, in which aid could not be separated from the various aggregate foreign inflow measures, were

[13] Levy (1987) estimated a simple model by OLS and TSLS methods respectively.

[14] The Dutch disease phenomenon basically describes a situation where an inflow of foreign exchange in any form puts upward pressure on the real exchange rate of the recipient country by stimulating rapid domestic inflation.

placed in a second group (F). The number of regressions in which the impact of either A or F on respectively savings (S), investment (I) and growth (G) was analysed. It added up to respectively 41, 18, and 72. They finally recorded the number of significantly positive (+), insignificant (0), and significantly negative (-) relations between the dependent and explanatory variables. Their results showed that most of the studies found a significant positive effect of foreign aid and foreign resource inflows on economic growth and investment. In case of savings, most of the empirical studies showed a negative effect of foreign aid and foreign resource inflows on domestic savings[15].

3. EMPIRICAL STUDIES ON DEBT ISSUES

3.1. Debt Sustainability Analysis

Avramovic et al. (1964) conducted a detailed empirical research on the external debt problems of a country. They identified the following variables as responsible for a country's short-term debt servicing capacity problem: fluctuating (exports, capital flows, imports induced by internal shocks), offsetting (reserves, compensatory finances, compressible imports) and rigid (interest payments, amortisation payments, essential imports). Of these nine variables, they considered the following three: amortisation, interest, and exports in the form of debt service ratio to make a judgment on the sustainability of debt policies. Apart from this indicator, they also focused on the external performance of the economy in relation to the debt service claim on it. According to them, the bunching of maturities mainly caused the most serious liquidity crisis. To avoid risk from such a crisis and hence the probability of such a crisis, they suggested that attention should be focused on the advantage of

[15] For more details, see Hansen and Tarp (2000) pp. 380-382.

longer maturities of debt, and balancing these advantages against the cost of long-term debt.

The shortcomings of debt-service ratio are well known. Foremost, we have seen in the past that many countries have severe debt servicing problems with low values of debt service ratio while others have successfully managed a high value of debt service ratio. Secondly, debt service ratio is not a crucial variable for sustainability of debt policies. Third, there is no direct link between the debt service ratio and efficiency of the economy. To overcome some of these shortcomings, attempts have been made in the empirical literature to develop a quantitative technique by examining identified cases of debt difficulties (i.e. those involving debt rescheduling). For this, they have resorted to statistical techniques like discriminant analysis, logit or probit analysis[16]. Table 3 summarises the identified macroeconomic indicators of external debt crises obtained from discriminant, logit and probit analyses.

The first study that follows the discriminant approach was made by Frank and Cline (1971). They identified three variables (the ratio of debt service to exports, the ratio of amortisation payments to debt, and the ratio of imports to reserves) as being most relevant for forecasting debt-servicing difficulties[17].

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[16] Discriminant technique assumes the existence of distinct subpopulation, (here two: rescheduling and non-rescheduling countries). On the other hand, logit or probit analysis is used to predict the probability of rescheduling on the basis of the values of the underlying attributes.

[17] They considered eight indicators in all. The other five indicators were: (i) growth rate of exports; (ii) non-compressible imports as a fraction of total imports; (iii) per capita income; (iv) ratio of imports to GNP; (v) export fluctuation index.

A different approach for the quantitative analysis of the debt servicing problem was suggested by Feder and Just (1977). They utilised a logit model to relate a set of economic indicators to the probability of rescheduling. Their logit model indicated that six economic variables were significantly related to debt-servicing capacity. In addition to three ratios (imports to reserves, amortisation to debt and debt service), as suggested by Frank and Cline (1971), their results indicated that export growth, per capita income and the capital inflows to debt service ratios were also significant indicators of debt servicing capacity. Feder, Just and Ross (1981) continued their previous work using the same logit approach covering more countries and providing appropriate regional representation. They also criticised previous studies for omitting the private non-guaranteed debt in their analysis. Their findings are reported in Table 3.

Lee (1983) examined various aspects of the external debt problem of Asian Developing Countries. He described the various debt burdens in-depth, e.g. debt service payments to exports, debt service payments to GNP, interest payments to exports, interest payments to GNP, outstanding debt to exports, outstanding debt to GNP, international reserves to outstanding debt, and international reserves to imports. Besides, he used critical interest rate to check the debt sustainability of Asian developing countries[18]. He concluded that in addition to rising interest rates, the long run debt servicing capacity of Asian developing countries generally deteriorated during the period 1964-1981 mainly due to a change in their capital output ratio and marginal saving rates.

[18] These Asian countries were China, Hong Kong, Korea, Singapore, Indonesia, Malaysia, Philippines, Thailand, Bangladesh, Burma, India, Nepal, Pakistan and Sri Lanka.

Kharas (1984) disagreed with the previous empirical studies that were based on pure empirical approach and lack of theoretical underpinnings. According to him, this weakens the confidence in the interpretation of the results and their use for forecasting purposes. In his growth-cum-debt model, the creditworthiness variable was derived by comparison of actual capital stock with a critical level representing the stock necessary to generate the tax base that provides the government with enough revenues to service debt. The probability of rescheduling was linked to debt service-capital ratio, net inflow-capital ratio, investment-capital ratio and population-capital ratio[19]. The dependent variable was whether a country actually rescheduled its debt service payments or not in a given year. He estimated two probit models for forty-three countries over the period 1965-1976. He concluded that countries with a high level of debt service to GDP have a greater probability of rescheduling. The higher level of net foreign capital inflows and per capita income were considered as a factor raising the degree of creditworthiness. Similarly, higher investment rates were considered a factor reducing the risk of rescheduling.

In their classic essay, "An Econometric Approach to Creditworthiness: Is there Life after Debt?" McFadden et al. (1985) carried out an in-depth analysis of the debt servicing problem. They also differ from others in their definition of debt servicing by including a number of indicators of repayment problems in addition to rescheduling incident, such as arrears in debt servicing, the existence of upper credit tranche facility and current negotiation to reschedule private or official debt for the country under consideration. Using improved data for 93 countries over the period 1971-82 and various probit and logit specifications, they estimated the probability of a country's debt

[19] However, the author used GDP as a proxy for capital stock because of the non availability of the capital stock data across countries.

repayment problems in the following years as a function of an indicator of the debt problem in the previous period and a number of macroeconomic ratios such as debt-service/exports, exports/GDP, and real GDP/population. Apart from these improvements, McFadden et al. (1985) made another advancement by specifying and estimating a structural model, which separately identified supply and demand for new loans as well as limit on arrears that will be permitted before debt must be rescheduled or restructured. Their estimates suggested that the demand for new loans was extremely sensitive to debt-service ratio, smooth export fluctuation, strong cross country variation in willingness to borrow, openness (measured by import ratios) of the economy, etc. The supply function is dependent on payment problems and the principal due and insensitive to standard indicators of country performance.

In contrast to other probit analysis, Berg and Sachs (1988) developed a cross-country statistical model of debt rescheduling by incorporating the key structural characteristics of developing countries, such as trade regimes (outward or inward), degree of income inequality, share of agriculture in GNP and per capita GNP. They found that higher income inequality was a significant predictor of debt rescheduling in a cross-section of middle-income countries. They also found that outward orientation of the trade regime was a significant predictor of a reduced probability of debt rescheduling.

Since all econometric models were estimated across a diverse group of countries over a long period, it was therefore doubtful that stable parameters exist across countries. To overcome this weakness, Schinke (1990) used the spreads (over LIBOR) for measuring creditworthiness in his model. The rationale behind this as explained by Schinke was that the

higher the probability of default, the higher the risk and thus the spread and the lower the creditworthiness. Schinke found that debt-output ratio, reserve-GNP ratio, debt service-export ratio, average propensity to invest and current account/GDP ratio were significant predictors of creditworthiness in case of the Chilean economy.

Table 3: Selected Studies of Repayment of Crisis in Developing Countries

Variables	Frank and Cline (1971)	Feder and Just (1977)	Feder-Just and Ross (1981)	Mc- Fadden et al. (1985)
Debt-Service/Exports	+	+	+	+
Principal-Service/Debt	-	-		
Imports/Reserves	+	+	+	
Debt/GDP				
Debt/Exports				+
Debt-Service/Reserves				
GNP per capita		-	-	-
Imports/GDP				+
FOREX inflows/Debt-Service		-	-	
(Current Account)/Exports				
Exports/GNP				
Rate of Domestic Inflation				
Growth Rate of Exports		-		
Growth Rate of GDP				-
Growth Rate of Money Supply				
Growth Rate of Reserves				
Growth Rate of GNP per capita				
Total Borrowing/Total Imports				

Source: As indicated in the first row of the table. Note: Variables with significant effects are shown by the sign of effects.

In a very recent study, Waheed (2003) performed a risk analysis on external indebtedness of Pakistan by utilising a very long time series data from 1961 to 2001. Besides eight debt burden and debt-service indicators, the author also considered four key performance indicators, namely (i) current account balance to GDP; (ii) fiscal account balance to GDP; (iii) national savings to GDP and (iv) total investment to GDP, in order to

supplement his findings from the debt indicator approach. Based on the debt indicator and key performance indicators, the author concluded that Pakistan's debt servicing capacity has declined over time.

For any particular country, debt sustainability analysis has some limitations. First, the calculations are sensitive to the projections of exogenous variables and the margins of error are inevitably large. Second, debt sustainability analysis measures a country's "ability to pay" but the debt problem may be derived from a lack of "willingness to pay". The literature on sovereign debt has, however, paid little attention to this issue.

3.2. Debt Overhang

There have been several attempts to empirically assess the external debt-growth link—the debt overhang[20] and crowding out effect—mainly by OLS. Most of the empirical studies include a standard set of domestic variables, debt policy and other exogenous explanatory variables. Most of the studies found one or more debt variable to be significantly and negatively correlated with investment or growth (depending on the focus of the study). For instance, Borensztein (1990) evaluated the effects of foreign debt on investment in a heavily-indebted country using numerical simulations of a simple rational expectation growth model. He distinguished between two effects. The effects due to "debt overhang" of the past accumulated debts and the effect of "credit rationing" or inability to obtain new financing. His results from simulations indicated that credit rationing has powerful disincentive to investment as compared to debt overhang. Similarly, Cohen's (1993) results for 81 developing countries

[20] Debt overhang refers to the existence of a large debt that has adverse consequences for investment and growth because investors expect that current and future taxes will be increased to affect the transfer of resources abroad.

over three sub-periods of 1965 to 1987 showed that the level of stock of debt does not appear to have much power to explain the slowdown of investment in developing countries during the 1980s. He found that the actual flows of net transfers are important and the actual service of debt 'crowded out' investment.

Elbadawi et al. (1997) also confirmed a debt overhang effect on economic growth by using a cross section regression for 99 developing countries spanning Sub-Saharan Africa (SSA), Latin America, Asia and the Middle East. They identified three direct channels in which indebtedness in SSA works against growth: current debt inflows as a ratio of GDP, past debt accumulation and debt service ratio. The fourth indirect channel works through the impacts of the above channels on public sector expenditures. They found that debt accumulation deters growth while debt stock spurs it. Their results also showed that the debt burden led to fiscal distress as manifested by severely compressed budgets.

Table 4 summarises the discussion on this section listing the potential factors related to the debt repayment problem in developing countries.

Table 4: Potential Factors Related to Repayment Problem

Factors in Debtor Countries

a) Shocks due to weather, social unrest and political uncertainty.
b) Poor economic policies (high current consumption, low tax revenue, high fiscal and current account deficit, and trade policy).
c) Poor economic performance (low growth, low exports, high imports, severe domestic inflation, unemployment, price distortion, high interest rate, volatile exchange rate).
d) Speculation and capital flight.
e) Short-term borrowing at commercial terms.

Factors in the World Economy

a) Input (mainly oil) price shocks.
b) Decrease in the price of developing country exports.
c) Decrease in demand for developing country exports.
d) Reduction in grants and concessional term loans.

4. SOURCES OF DISCREPANCIES IN EMPIRICAL STUDIES

Most results of empirical studies regarding the macroeconomic impact of foreign capital inflows on the economy of developing countries are conflicting. This may be due to the different samples, time periods, variable measures, etc. or to the inadequacy of attention to the econometric techniques. Some of these issues are briefly discussed in the following sub-section.

4.1. Absence of Lag Structure

There is a lag period between the flow of capital and its growth effects. The length of this lag varies since the gestation period will vary with the nature of the projects undertaken and the ability of the countries to absorb foreign capital inflows. Mosley (1987) also pointed out that the absence of any sort of lag structure from most models is a serious omission. White (1992a) suggested that a better procedure, more in line with modern econometric techniques, would have been to include several lags of foreign aid to eliminate those that appear to play no part in the data generation process.

4.2. Open-Endedness of Theories

A fundamental problem with the growth regressions is determining what variables to include in the analysis. This problem occurs because growth theories are open-ended. Therefore, with such studies, there will always undoubtedly be the omitted variable problem; some factors will be varying across countries (and/or time), which affect growth and are not included in the analysis. Levine and Renelt (1992) reported that over 50 variables were found to be significantly correlated with economic growth. Of the forty-one growth

studies surveyed in Levine and Renalt (1991), thirty-three included investment, twenty-nine included population growth, thirteen included a human-capital measure and eighteen included a measure of initial income.

This issue of open-endedness has not been directly addressed within the literature. Instead, a number of researchers have proposed ways to deal with the robustness of variables in growth regressions using sensitivity analysis[21]. Levine and Renelt (1992) explained the sensitivity analysis in detail based on Edward Leamer's ideas on extreme bond analysis (see Leamer 1983). In such an analysis, a coefficient is robust if the sign of its OLS estimates stays constant across a set of regressions representing different possible combinations of other variables.

To the extent that foreign capital correlates with any of these omitted variables, the equation is subject to a specification error that will cause the estimate of the foreign capital coefficient to be biased. Levine and Renelt (1992) examined the robustness of some established results in the growth literature. They found that many of the macroeconomic indicators commonly used in the literature were indeed correlated with growth, but that the results were fragile.

4.3. Simultaneous Bias

It is believed that a simple model is not an accurate representation of the data. Specification tests, such as the t-statistics, are only valid on the assumption that the specified model is correct. If the model

[21] Making/carrying out a sensitivity analysis means addressing the questions: Do the conclusions withstand slight alterations in the right-hand-side variables, in functional form, serial correlation assumptions, measurement error processes, distributional assumptions, sample period, and the weighting of observations?

is not correctly specified, the significant t-statistics will be meaningless.

It is obvious that the savings and growth performance of a country depends on many factors beside foreign capital inflows, such as level and structure of consumption, balance of trade, tax system, financial markets and the rate of population growth. The estimation method used also affects the results. The ordinary least square estimation results may be misleading if foreign capital and economic growth are simultaneously determined.

There are a few studies that adopted a simultaneous approach. The most substantial attempt to tackle the simultaneity problem was made by Gupta and Islam (1983) who included a range of demographic variables in their nine equations systems[22]. However, they estimated the model using OLS on each equation, which they argued would yield estimates of direct effect. Snyder (1990) also estimated a simple two equation simultaneous model using the OLS method. Simultaneous estimation techniques could not be applied to his model as it was underidentified[23]. Snyder argued that TSLS could be inefficient in small samples, particularly when the number of parameters to be estimated is large.

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[22] The demographic variables included in their model were: (i) dependency rate; (ii) birth rate; (iii) female labor force participation rate; (iv) infant mortality rate; (v) total labor force participation rate; (vi) population density; (vii) percentage of labor force in agriculture.

[23] The identification problem asks whether one can obtain unique numerical estimates of the structural coefficients from the estimated reduced form coefficient. If this can be done, an equation in a system is identified, otherwise it is un-identified or under-identified.

4.4. Parameter Heterogeneity

Another problem with conventional growth analysis is the assumption of parameter homogeneity. That is, the parameters that describe growth are identical across countries. This assumption is surely implausible.

Foreign capital may well contribute to growth, but both the extent to which and the period over which it occurs may be very different for different types and different sectors. There is no theoretical foundation whatsoever for the assumption that the impact of foreign capital on growth is constant either across countries or across time. White (1992b) reported that this indeed is the case in a cross-section regression.

4.5. Causality versus Correlation

Besides statistical problems, the question of the causality direction is largely unanswered. Does foreign capital cause output or output cause foreign capital? If a significant negative correlation between domestic savings and foreign aid can be shown, which way is the direction of causality? Does it represent a displacement effect? Alternatively, does causality run from low savings to high aid ratios?

While it seems almost self-evident that we need economic theory to interpret the statistical relationship in an economically meaningful way, the growth literature to date has not optimally integrated econometrics into economic theory. In most of the earlier studies, no systematic causal analysis was made. Most of the earlier studies imposed *a priori* a specific pattern of causality without making allowance for the statistical requirements of the causality test. This is difficult to be justified on any grounds.

4.6. Definition of Variables

In the empirical literature, little attention was paid to the definition of variables. For example, Griffin (1970) aggregated all aid inflows and identified them with the deficit on current account. This is obviously inappropriate in principle because such a deficit may be financed by several ways - official aid, private investment, suppliers' credit, or emigrants' remittances. Hence, to lump aid flow with other financial flows and use these figures as a basis for commenting on the effects of official foreign aid is likely to be highly suspicious.

There is also the problem of whether to use commitments, gross disbursement, net disbursement or net transfers. The difference between net disbursement and net transfer is that the former deducts only repayments of capital while the latter deducts interest payments as well. Lipton (1972) argued that net figures should be used if the foreign exchange constraint was binding and gross for a binding savings gap[24].

Having decided between gross and net figures, the next problem is how these figures will be adjusted? Should they be converted to their grand equivalent or not? Further problems include the use of current or constant prices and the choice of the exchange rate. White (1992a) suggested that since the value of additional resources made available by the aid was presumably the variable of interest, the figures should be deflated by an import price index[25].

4.7. Quality of Data

[24] See Lipton (1972) p. 169.

[25] See White (1992a) p. 203.

To test the relationship between foreign capital and economic growth it is clearly essential to use accurate quantifiable data. Questions about the accuracy of the data are by no means confined to the reliability of statistics on foreign capital; they also apply to other aggregates like growth, savings and investment. As statisticians and national accounts experts continually stress, the less a country is developed, the more likely it will be the case that the national economic aggregates will be incorrectly calculated. The accuracy of the data may also be correlated with factors such as administrative competence, economic structure, economic policies and political instability[26].

4.8. Research Design

All these studies attempted to infer causal relationships from different research designs. These are: time series, cross section, and panel analysis. There are well known difficulties with cross section data. These are multiplied with panel data (where time series for the same cross section are pooled). Some of the problems associated with the cross section data are: first, the cross section analysis deals with a large group of countries, but they differ from one another in size, openness, factor endowment, institutional background, and the level of development attained. All these differences cannot be treated as random; the cross-section analysis is likely to lead to specification errors. Second, the methodology employed in the derivation of data between countries is different. In addition, the exogenous factor may influence differently the data of individual countries. For this reason, the assumption of a constant (equal) variance of disturbance terms in cross-section regression analysis may not hold. As a result, use of the ordinary least square (OLS) method cannot provide the

[26] For details, see Kravis (1984).

best estimates of the regression coefficients. Finally, besides the above problems, there is also the question of the usefulness of applying cross-section results to policy formulation for individual countries.

4.9. Spurious Regression

The bulk of the previous studies used standard econometric techniques. However, the failure of those techniques to take into account the non-stationary behavior of macroeconomic time series resulted in "spurious regression". It is now standard in time series econometrics to test for Cointegration between the variable under scrutiny, which was ignored by previous studies. To do this properly would require finding the cointegrating relationship or error correction mechanism for each time series. There is also need to test the order of integration of each time series[27].

The test for order of integration is important because only variables of the same order of integration exhibit a stable long-run relationship and they are cointegrated. If the variables are not cointegrated, this implies that the error term is non-stationary and OLS estimates are not reliable.

4.10. Stock and Flow Measures

In the case of differences, which may account for these contradictory

[27] This is simply a unit root test to identify at what order of integration the series is stationary. (An I (0) variable is stationary in levels (i.e. it has constant mean and constant variance around the mean; any shock that causes a deviation from the mean will have only a temporary effect), which does not mean that the level is constant over time (it may, for example, have a trend). An I (1) variable is stationary in first differences (changes), an I (2) variable is stationary in second differences (changes in changes), and so on.

findings, flow instead of stock measure may be used. Flow measures describe the amount of foreign capital coming into a country within a limited time period, while stock measures describe the accumulated amount that exists in a country.

It is believed that the current inflows of foreign capital cause short-term increases in growth due to the contribution to capital formation and demand as foreign corporations purchase land, labor, and materials and start production, while the long-run structural distortions of the national economy produced by foreign investment and the repatriation of profits tend to produce negative effects over time. Thus, short-term flows of investment and aid have positive effects on growth, but their cumulative effect over time is negative.[28]

5. SUMMARY AND CONCLUSION

The traditional macroeconomic rationale for foreign capital relates to its ability to supplement domestic savings, foreign exchange, and government revenue, thereby contributing to higher economic growth. This process presumes a simple Harrod-Domar context in which growth is driven by physical capital formation. In the Harrod-Domar model, output depends upon the investment rate and the productivity of investment. Savings finance investment, and in an open economy total savings equal the sum of domestic and foreign savings. A savings gap exists if domestic savings alone are insufficient to finance the investment required to attain a target rate of growth[29]. In addition to the savings gap, there is also a trade gap or foreign exchange gap which is based on the assumption that not all investment goods can be produced domestically. Hence, a certain level of imports is required to attain the desired

[28] For details, see Bornschier et al. (1978), p. 667

[29] See Harrod (1939), Domar (1946) and Rosentein-Rodan (1961).

investment and ultimately economic growth. This import is financed with either export earnings or foreign capital inflows. If exports are not sufficient to cover imports requirement (as in the case of developing countries), then foreign exchange shortage becomes the binding constraint on economic growth. These two gaps are combined in the two-gap model, mainly associated with Chenery and Strout (1966). Over the years, a number of other gaps have been proposed, such as the technology gap, the food gap, the gender gap and the environment gap. More closely related to the two-gap models is the recent concern over the third "fiscal" gap between government revenue and expenditures, as illustrated by the three-gap models by Bacha (1990) and Taylor (1990). Although the fiscal gap is a subset of the savings gap, the former may be the binding constraint if there is some limit on public spending.

To summarise, gap models predict a positive role of foreign capital whereby it supplements domestic savings, increases foreign exchange earnings and government revenue, and hence promotes economic growth. The empirical studies of the effects of foreign capital on domestic savings, investment and economic growth were discussed in this survey. The overall effects of foreign capital on economic growth in most of the empirical studies were positive and the negative effects were mainly due to methodological issues or data limitation.

In recent years, the external debt and debt servicing problem of the developing countries became the centre of discussion in empirical studies. Gap-models mainly focus on filling resource gaps through foreign capital inflows and no distinction is made between aid, grant, loans, foreign private investment, and other flows. However, when these gaps are filled through debt-creating flows, problems may arise to the recipient countries in the form of future repayments, which may have adverse implications

for their macroeconomic performance. Empirical studies related to two types of debt problems were discussed in this survey. The first was related to the debt servicing problem and the second to the debt overhang issue. The empirical evidence on debt servicing difficulty shows that such a problem occurs when payment arrears accumulate. The debt overhang occurs when a country's foreign debt is very important and adversely affects economic growth. This problem is less easily identified in empirical studies since economic growth is influenced by a host of other factors besides foreign debt.

This survey tries to explain what are believed to be the most important developments. Sometimes, the explanation may be too simplified, or too abbreviated. Consultation of the original work is, therefore, recommended for a greater understanding of the model, estimation techniques, and results. Nevertheless, it is obvious that most of the previous empirical studies are cross-sectional in nature. There is a great need for case-by-case studies in view of each country's unique characteristics. It is also expected that time series would provide better estimates of the relationship between foreign capital, savings and growth. As concluded by Cassen et al (1986:41), "Before anything definitive can be said about the quantitative impact of aid on macroeconomic performance, detailed studies of particular countries over reasonably long periods are required. Aggregative regression studies are unlikely to resolve the issue either way". A similar conclusion was drawn by White (1992b: 134): "Further work should be based on country level studies and should employ more detailed macroeconomic models". Hansen and Tarp (2001) stress the need for more theoretical work before any kind of regression is used for policy purposes. Thus, the future empirical work in this area should focus more on theoretical underpinnings and econometric techniques and be based on country-specific studies. This is particularly

important given the stringent conditionalities of debt relief initiatives.

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