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Does Excessive Debt Discourage Foreign Direct Investment in Highly Indebted Poor Countries?

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To

Daryl McLeod, Panini Murshid, Dominick Salvatore,
and
my family: Nabia, Denise, and Conrad

Table of Contents

CHAPTER 1

INTRODUCTION

For over twenty years a number of the poorest countries in the world have been plagued by a debt overhang. The debt overhang can act as a tax on investment, discouraging growth and development. . This is normally the result of implied debt repayment obligations that tie conditions for future debt repayment to future economic performance of debtor countries. Part of the increase in future output goes to additional debt service. Economic analysis tells us that such arrangements create a disincentive to invest. Corbo and Hernández (2003) found FDI flows to increase in indebted countries.[1] I evaluate the tenability of this hypothesis using FDI flows into the severely indebted countries and control group of moderately indebted countries.

Although several economists popularized the debt overhang argument, the argument has been largely credited to Jeffrey Sachs and Paul Krugman. The basic argument is that social planners (debtor governments in this case) are optimizing agents who have to decide how much to borrow and invest during the first period, subject to a two-period-constraint. In the original period debt is contracted to be repaid at the terminal period two. In period one, which is the intervening period, new debt can only be contracted if new creditors have assurance that the debt could be repaid at the terminal period. All debtors are being subjected to the same exposure.

[1] See Larrain, *Capital Flows, Capital Controls, and Currency Crises*, p. 96.

1.1 *Debt Overhang Issues*

In his work "Symposium on New Institutions for Developing Country Debt", Kenneth Rogoff (1990) succinctly captures the debt problem. Indebted governments balk at the thought of repaying hundreds of billions of dollars they borrowed from commercial banks in the industrialized countries during the 1970s and 1980s. Many of these debtor countries are quite fragile politically, and they have difficulties transferring a few percent of their GNP abroad every year.

Of considerable pertinence is whether debt is directly related to poor economic performance or low growth in highly indebted countries. The core concept of the debt overhang is that the overhang of external debt creates a significant tax on new investment, and therefore becomes a disincentive to new investment. A debt that is exceedingly large act as an incremental tax rate on efforts to garner foreign exchange earnings, the bulk of any improvement will go to the benefit of creditors rather than the debtors.

Heavily indebted countries tend to rely heavily on trade taxes, which can be easily collected at the port of entry or exit. High tax revenues therefore translate into high trade taxes, which adversely affect foreign direct investors. The cumulative effect of huge debts therefore, poses a risk of default and a discouragement of investment.

Some studies have been done on the effects of debt on investment. Borensztein (1990) used numerical simulations of a rational expectations two-period growth model to assess

the effects of debt overhang and credit rationing on investment. He came to the conclusion that credit rationing or the ability to obtain new sources of financing may be a powerful disincentive to investment. Alternatively making the argument that debt reduction plans need to be accompanied by new lending.

The debt Laffer curve has been looked upon as a viable illustration for debt reduction which reduces the probability of default, and enhances the potential to grow. In the 1980s it was perceived by some economists that creditors did not properly collaborate to devise methods for collecting their debts to avoid the reality of default. When these inefficiencies become potent, creditors will be confronted with the Debt Relief Laffer Curve. The income-depressing effects of the debt make it more likely that the debtor will default when confronted with an adverse shock. A reduction of vulnerability increases the expected value of a debt. Therefore when a country can look forward to borrowing and growing, it is apt to reject the repudiation of debts. The debt Laffer curve is also indicative of the fact that some amount of debt may be desirable. The recent study of Pattillo et. al. (2002) makes such a case.

When a country cannot expect to borrow more, its decision will depend on the advantages of halting debt-service payments and the strength of the afore-mentioned inefficiencies, which will be weighted against the penalties of repudiation. Repudiation becomes beneficial when the debt is larger than the present value of the penalties. The precise position of a problem debtor on the Laffer curve is not readily apparent, but an estimate of the curve has been provided by Claessens et. al.(1989). They show that

large debtors are more likely to be on the downward sloping segment of the curve, or at least not too far from the inflexion.

A case for mutual benefit to the creditors and debtors was put forward by Jeffrey Sachs (1984), who argued that debt reduction can improve the economic performance of the debtor countries, and thereby the ultimate value of repayments that the bank will receive. Debt reduction can be a Pareto improvement, under an institutional setting designed to minimize voluntary solution or a free rider problem.

Eaton (1990), and Bulow and Rogoff (1990) question the theory that debt is responsible for the level of growth. Bulow and Rogoff (1990) saw growth problems as symptoms rather than cause of the debt crisis. The Bulow-Rogoff (1990) argument is predicated on the fact that a large fraction of the growth shortfall in the highly indebted countries occurred from 1980 to 1983, before the indebted countries were required to make any significant debt repayments. They observed that the world was already in recession for reasons which could be partly attributed to a steep rise in world interest rate, and a prolonged deterioration in the terms of trade of the indebted countries. They contend that the crisis really emerged only after almost three years of dismal growth. During 1980-1982, the highly indebted countries also received substantial net resource transfers from abroad, about $24 billion more in new long-term loans than they were required to repay in principal and interest. As a matter of fact average per capita income in 17 highly indebted countries, $1430 in 1987, was greater than the $470 in developing East Asia.

Eaton (1990) extends this argument to show that some of the highly indebted countries in the late 1980s were in actual fact rich in resources and have a lot of capital in flight. Under such circumstances debt relief becomes questionable. These critics of debt relief question the circumstances under which relief can be done. Cohen (1993) argues that large debt is not necessarily an unconditional predictor of low investment in the 1980s, and that investment was not abnormally low, when compared to "financial autarky" rate,[2] but that the actual service of debt crowded out investment. He showed that for every one percent of GDP paid abroad, domestic investment fell by 0.3 percent of GDP.

Cohen (1993) observes that most empirical studies which try to show a negative influence of debt on investment compare investment rates that prevailed in the 1970s to those that prevailed after the 1982 debt crisis. This comparison is flawed for reasons he identified as: (i) interest rate differentials in time periods (i.e. low before the oil crisis, and high thereafter); and (ii) the efficiency of the rescheduling process. An efficient rescheduling process will crowd in investment, while an inefficient one will crowd out investment.

His test of whether the surprise fall in investment in the 1980s was significantly correlated to the surprise rise in the service of debt, proved to be contingent on the rescheduling process.

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[2] The interest rate for which saving is equal to investment, against which to compare the rate that prevailed in the 1980s. The difficulties calculating this, because of no documentation, but also because financial markets are cleared through price and non-price factors, necessitates the use of a surrogate—the correlation of investment and saving with the trade balance. This is used to show the dependency of saving and investment on the shadow cost of capital. See p. 438 for further adjustments.

The Cohen (1993) results were partly based on an estimated investment equation for a 81 developing countries over three sub-periods: 1965-1973, 1974-1981, and 1982-1987. The data was pooled and estimated with White's heteroskedasticity-consistent covariance matrix, and used with prior studies of Romer (1986), Barro (1989), and Kormendi and Meguire (1985).

My research addresses the following issues: (i) Is the indebtedness of the poor country discouraging FDI flows into the poor countries? (ii) Could capital flows, in particular FDI flows, contribute to investment or saving, and GDP growth? To deal with these issues I use as a control group, countries which are not highly indebted, and compare the findings for the two groups of countries. The Highly Indebted and Poor countries (HIPCs) considered in this work, are based on the World Bank's classification of the late 1990s.

Regression analyses in this work are mainly concerned with the following issues:
(i) What are the effects of FDI flows and investment on GDP growth? (ii) What are the effects of FDI flows on investment and savings? and (iii) What are the effects of debt on FDI flows?

As a policy matter, this research acknowledges the ongoing debates on the HIPC Initiative, and the desire to get a serious commitment to debt reduction. This is so because inflows are alternative sources of financing, which relieves heavily indebted governments of the burden of servicing their debts and meeting their obligations to social programs.

Policy-oriented studies mostly zero in on lack of transparency and corruption. For example, Shang-Jin Wei, (1997), Borensztein, De Gregorio, and Lee (1998), and Wilhelms (1998). Le (2000) found corruption to be prevalent in the East Asian countries, but ironically a lot of FDI, particularly from Japan has been flowing into these countries. It is believed that the growth rate in this region, which is higher than average might have been a pull factor. Other factors which make the impact of corruption elusive include Confucianism, and the culture of bribery which might have been embedded for a long period of time. Wei (1997) finds, however that within the region foreign investors still prefer to go to less corrupt countries. From a general perspective however, apart from the HIPCs, policies have generally contributed to GDP growth and significantly so.

The findings of Wilhelms (1998) make a compelling case for the fitness theory. The Institutional FDI Fitness model predicts that all things being equal, countries with high institutional fitness will experience higher inflows of FDI than countries with low institutional fitness. The Country Policy Institutional and Fitness (CPIA) index, compiled by the World Bank, is a much more comprehensive and extended version of their measure of fitness.

What are the solutions to the debt problem? There could understandably be no easy solution, because the problems are perceived differently by those involved. The World Bank and the IMF see the problem in terms of structural reforms. The fundamental

causes are embedded in the reluctance to implement prescribed reforms and attract foreign investment.

On the other side of the spectrum most of the HIPCs see their woes not in terms of reforms, but exogenous forces such as poor terms of trade for primary commodities. For example, Uganda depends on coffee for 60 percent of its export revenues, but the price of coffee has declined 70 percent since 1997. The price of ground nuts has fallen by 15 percent over the same period. Guinea Bissau depends on the crop for 70 percent of its export earnings, and Malawi for 60 percent. This has been made worse by the Bank's overambitious projections. For example, it is projected that the HIPCs will have an annual growth rate of 5-6 percent between 2000 and 2005, but in actual fact actual growth rate for 1990 and 1999 turned out to be 2.1 percent.

The IMF does not envisage a gloomy picture for the reduction of debt service to export ratio for countries which have already reached decision point.

This work draws on resources from prominent literature in the field, some of the most attractive being that of Gruben and McLeod (1998), Susan Bosworth and Collins (1999), and Mody and Murshid (2002). The benchmark for my research was fundamentally based on the data and findings of Mody and Murshid (2002).
In chapter two, I review the literature which is relevant to this research. I have tried to categorize the literature into headings, which will make the literature amenable to comprehensive scrutiny. Three components are relevant: - (i) FDI; (ii) the debt overhang;

and (iii) the HIPC Initiative. The literature for all these aspects is varied and inconclusive, and the dilemma has influenced my choice of this research.

Chapter three provides a theoretical framework, based on the Solow growth model, and Sachs' perception of the debt overhang[3]. I find these models suitable to deal with the issues of Total Factor Productivity (TFP), and the debt-overhang as far as the HIPCs are concerned. I also define aspects of the data used in this work and the kind of transformation which has accompanied the use of the data.

The empirical results of the regressions used in this work are presented in chapter four. The specifications are also done with considerations of the factors which normally tend to bias estimation. The Feasible Generalized Least Squares (FGLS), and the Instrumental Variable (IV) approaches, specifically Weighted Two-Stage Least Squares (W2SLS), are the preferred estimating methods for regressions in this work. For diagnostics, I rely on the Wald test which is capable of testing the significance of multiple coefficients, and linear and nonlinear stipulations. The results of these tests are provided in various tables. Conclusions based on my empirical results are provided in chapter five.

[3] The model is reproduced in *Development Economics*, by Pierre-Richard Agenor, and Peter Montiel, 1999, 572-574.

CHAPTER 2

REVIEW OF THE LITERATURE

The pertinent literature for review falls into two broad categories: - (i) Foreign Direct Investment (FDI); and (ii) debt overhang. The varied and diverse nature of the literature necessitates a framework within which it could be analyzed. There is evidently an understandable lack of consensus on debt relief and FDI determinants. This is the case because of samples, country nuances, methods of estimation, choice of endogenous and/or exogenous variables, and in general, differences in philosophical approaches to the issues at hand. For example, Claessens et. al (1995) observe that "research on international capital flows has differed on whether it is accurate to treat the flows as exogenous (with respect to the country in question) or endogenous."[4]

I have identified three categories of FDI flows in the literature: - (i) the direction of flows; (ii) the effects of flows; and (iii) the problems and contingency of flows on the absorptive environment. FDI flow is a private capital flow, which may be measured in net or gross terms. It can also be measured as a cumulative stock, and it may or may not lead to private investment i.e. the purchase of new machinery and equipment. For the debt issue, I focus on the overhang argument and some of the criticisms of the argument.

[4] Classens, et al. (1995) p.155

2.1 *Directions of flows*

In their study of how Sub-Saharan Africa can attract more private capital inflows, Bhattacharya et. al (1997) observe that investors choose countries with stable political and economic environments. In addition, open markets, minimal regulation, good infrastructure facilities and low production costs are also key factors in attracting and maintaining foreign investment.[5] Many of the poor and severely indebted countries experience civil strife, macroeconomic instability, slow economic growth and small domestic markets. inward orientation and regulation of foreign investment, slow progress on privatization. poor infrastructure. and high wage and production costs.

A more general empirical analysis was provided by Wilhelms (1998). They focused on reasons for net FDI flows among 67 emerging economies between 1978 and 1995. They focus on Institutional FDI Fitness (IFF) theory. According to this theory FDI flows are determined less by "intransigent fundamentals than by institutional variables more amenable to change." These institutional variables, such as education/human capital, open markets, transparent government policies, and fair rule adjudication. involve the adoption and implementation of policies and laws to attract, absorb and retain FDI.

They accept the presupposition that policies geared directly or indirectly toward increasing FDI inflows are most effective when designed and implemented within an institutional framework conducive to FDI flows. [6] These institutions are the government,

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[5] Bhattacharya et al, "How Can Sub-Saharan Africa Attract More Private Capital Inflows?" www.worldbank.org fandd English 0697 articles 080697.htm, June 1997, pp 4-5.

[6] Wilhelms, "Foreign Direct Investment And Its Determinants In Emerging Economies,"

markets, and educational and sociocultural systems, which must be efficient and effective in transmitting policies into FDI transactions. Of all the institutions, they observe that socioculture is the oldest of the institutions. It is diffused, complex, all-encompassing, and therefore difficult and time-intensive to change.

A country's receptiveness to other socioculture and business mode is observed to be a function of the citizenry's level of education, exposure to foreign culture, and integration into the global economy. Markets are perceived as economic and financial indicators of FDI fitness, but a government presides over all the FDI fitness institutions. As a result investors focus on government policies as the primary source of incentive for FDI flows.

To operationally test the IFF theory, Wilhelms (1998) use the following functional form,

$$FDI = \beta_0 + \beta_1 G + \beta_2 M + \beta_3 E + \beta_4 S, \qquad (2.1)$$

where G stands for government; M for markets; E for education; and S for socioculture (β_0 is the intercept).

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www.eagerproject.com discussion9.shtml (July 1998). African Economic Policy Paper, Discussion Paper Number 9, July 1998. The study focuses on FDI, which as a rule, precedes portfolio inflows in the development process, but also because FDI tends to tolerate lesser institutional, in particular financial infrastructure than portfolio investment.

The data is structured into averages to avoid random variability which may occur on an annual basis (especially in small economies), and lagged to accommodate a lag between the dependent and explanatory variables.[7]

Equation 2.1 presupposes that all else being equal, countries with high institutional fitness will experience higher inflows of FDI than countries with low IFF (where high institutional fitness means transparent, well-functioning, reliable and predictable institutions).

The dependent variable is FDI as a percentage of gross domestic product (GDP). It is defined as net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in a country other than that of the investor.

The index for economic openness was obtained from Sachs and Warner (1995). The economic openness index is represented by a dummy variable out of the non-existence of a parallel market exchange premium, socialist form of government, export marketing board or import quotas.

The index for legal and administrative impartiality and transparency is taken from the International Country Risk Guide (ICRG) 1982-1995, published by the Institutional Reform and the Informal Sector (IRIS) Center and Political Risk Services. Five variables

[7] Three year averages for the dependent variables and five for the explanatory variables. The assumption that potential investors will evaluate country data from the previous five years before investing is given due consideration.

are used—government repudiation of contracts, expropriation, corruption in government, rule of law, (based on law and order), and bureaucratic quality.

Governmental fitness is derived from legal and administrative equity, and economic openness. The law making processes are transparent, efficient and reasonably democratic. At the executive level, fitness translates into enforcements of laws and policies which are transparent, efficient, and equitable. These standards also apply to adjudication.

Economic fitness is showed to be largely dependent on the degree of trade liberalization. Poor countries show fewer propensities to catch up with rich countries because their trade regimes are comparatively closed. Wilhelms (1998) use an economic index which takes into account an exchange rate regime (that reflects the true value of a currency, thereby reducing uncertainty and transaction costs for foreign investors), government regulation, and export-import regimes.

The ICRG (1982-1995) chose to include in their index a number of variables which illustrate governmental fitness were selected for their potential to be relevant to private investors (in particular legal fitness). These variables emphasize corruption and rule of law compiled by commercial risk agencies and include the following:

- government repudiation of contracts (scale of 0-10)
- risk of expropriation (0-10)
- corruption in government (0-6)
- law and order tradition/rule of law (0-6) and

- bureaucratic quality (0-6)[8]

Similar variables were used by the World Bank to construct its Country Policy Institutional Assessment (CPIA) index.[9] I use this variable as a proxy for institutional quality in many of growth and investment equations reported in Chapter 3.

Wilhelms (1998) use conditions for market fitness identified by the World Bank team include: (i) the level of development and linkage of domestic and international markets for goods, services and capital; (ii) GDP per capita; (iii) population as an indicator of market size; foreign trade as a percent of GDP (high volume i.e. more exports and imports, suggesting low restrictions); tax revenue as a percent of GDP (indicating taxation of the private sector); (iv) domestic credit to non-governmental agencies as an indicator of credit availability and financial intermediation; and (v) linkage—where energy availability facilitates FDI projects.

Education and socioculture has the effects of broadening horizons and making citizens more sophisticated and tolerant about foreign mores without imbibing them.. The World Bank team felt that countries exposed to international business practices are perceived of favorably by foreign investors, and therefore tend to attract more investment than those

[8] It is argued that corruption is related to bureaucratic quality, and that it is felt more immediately by the foreign investor than the rule of law. A strong rule of law implies low likelihood of expropriation or contract repudiation. Investors' legal rights are protected. See Wilhelms, op.cit. p.17.

[9] See http://www.worldbank.org/ida/CPIA2002.pdf

countries which are perceived of otherwise. Time dummy variables are used to control for period-specific effects.

Using regression analysis, Wilhelms (1998) came to the following conclusions:

- Economic openness is positively and robustly correlated with FDI.
- Strong rule of law and low corruption show the highest and most positive correlation with FDI.
- There is a weak positive relationship between total population and FDI.
- FDI is negatively correlated with GDP, suggesting that FDI tolerates a low degree of economic development.
- FDI takes place in low income economies while portfolio investment requires a higher level of economic development, specifically, financial intermediation.
- There is a positive and robust correlation between trade volume and FDI, suggesting that foreign investors prefer a freer trade environment to trade barriers and regulation; high taxes discourage FDI—taxes are perceived as a burden on business;
- Credit provision is positively correlated with FDI. Though host-country credit and banking facilities are normally inadequate, not all firms enjoy access to home-country credit. They must therefore rely on whatever paltry host-credit might be available.[10]

[10] For a complete result of the findings, see Wilhelms, op. cit.

The propensity for capital to flow south or go elsewhere is reasonably shown to be dependent on the institutions which are being cultivated and nurtured rather than uncontrollable generic variables.

2.2 *Pros and Cons of FDI*

The traditional argument in the literature is that FDI inflows increase the stock of capital. Other advantages of FDI could be found in its ability to facilitate international technology transfer, which in turn generate technological spillovers for local firms. Spillovers may be achieved through four important channels, which may have overlapping consequences—imitation, competition, linkages, and/or training.[11]

The benefits of FDI are contingent and not fait accompli. Virtually all the papers on the subject matter of FDI give a caveat about FDI. They agree in various forms that there needs to be an environment conducive to the benefits of FDI.

There are instances when some have been skeptical about the consequences of FDI flows. For example, Dependency theories, which flourished between the 1960s and 1980s, question the unequivocal benefits of FDI. Two schools of thought are prominent—the neo-Marxist, and the structuralist. The new-Marxist see developing countries as avenues of exploitation through international trade (with an accompanying deterioration in the

[11] Imitation is the emulation of advanced technologies, or managerial skills; competition is fostered by the entry of foreign firms to obtain efficiency or upgrade technology; linkages result from the interaction of domestic and foreign firms which lead to the training of personnel in the domestic market to more fully extract resources or become more efficient in partnership. Training is the necessity of improving human capital as a result of the introduction of new technology which can only be adopted when the know how is present. See Lensink and Morrissey (2001).

terms of trade of developing countries), and/or avenues for the extraction of profits by transnationals, which leads to a situation of dependence.

The new-Marxists perceive of the international system in terms of a core-periphery structure, in which resources are extracted from the peripheries (the poor/underdeveloped countries) to benefit the core (developed or industrialized countries). Modernization, capitalization, and industrialization are limited to the major export sector, around which other sectors of the developing countries evolve to provide the import needs of the core. The benefits of trade are not fully realized in such a structural relationship. Yet, though in its earliest form the structuralist critique was opposed to this type of exchange, it is much more readily apparent today that foreign private investment is indispensable to growth.

Structuralism developed to provide a compromise between the expanding capital nucleus (ECN) and the dependency theory, and advocated restrictions/controls on markets until the benefits are mutually comparable.[12] The move from the agricultural mode of production to that of industrialization is vital to economic development, but to mitigate the effects of adverse trade, economic policies like protective tariffs and import substitution are necessary to protect infant industries until they are capable of competing and moving dependent economies out of dependence. The two schools were in agreement that dependency impeded development.

[12] ECN theory emphasizes economic growth through capital formation. Capitalists and entrepreneurs are most adept at the uses of capital and must therefore preside over its use for maximum accumulation. See Cardoso and Faletto (1979).

Much more recent enquiries have put emphasis on the domestic environment for FDI flows. For example, Borensztein et.al (1998), observe that higher productivity of FDI holds only when the host country has a minimum threshold stock of human capital. The absorptive capacity for advanced technologies must therefore be high in the host economies. Klein et. al (2001), share the view that the environment must be right to dispel notions of exploitation and that regulations governing foreign investment need not be arbitrary.

FDI has been found to be a less volatile form of financing investment than is portfolio investment, and therefore crisis preventing. This finding has been credited to the work of Frankel and Rose (1996), which has also been extended and corroborated by Fernández-Arias and Hausmann (2000) with some limitations.

Frankel and Rose (1996) discovered that the FDI-debt ratio has a negative effect on the probability of crisis and is statistically very significant. Therefore for a given level of debt, more FDI would actually decrease the probability of default. They also found that countries with currency crashes (depreciation of currencies by at least 25%), tend to experience disproportionately small inflows of FDI (relatively high "hot money" portfolio flows). FDI is seen not only to be less risky in comparison to debt, but that in actual fact it reduces risk and the probability of crisis. It is not so clear why FDI could be perceived to be so protective, but it is conjectured that FDI flows react to anticipations of crisis. They estimate probit models linking their binary crash measure to their variables,

use a multivariate model, and pool all available data across countries and time. Their data consist of annual observations from 1971 through 1992 for one hundred and five countries. They examined seven different characteristics of the composition of capital inflows or debt, with each expressed as a percentage of the total stock of external debt.

Fernández-Arias and Hausmann (2000) updated the data of Frankel and Rose (1996) to include 1997 information, extended the set of countries to include industrial countries, but kept the prior definition of currency crises/crashes. They found, as did Frankel and Rose (1996), that the evidence suggests that FDI is safer than non-FDI only when they restrict the sample to developing countries.[13]

The view that FDI is a facilitator of poverty reduction has been supported in the literature by Klein and others (2001). They conclude that FDI is a key ingredient for successful economic growth in developing countries after assessing two key questions: (i) How can shrinking aid flows be best used to support the goal of poverty reduction? (ii) Does foreign direct investment support sound development; in particular, does it contribute to poverty reduction? Three important criteria informed their conclusion: (i) the key mechanism to transfer best practice across borders; (ii) the diffusion of best practice; and (iii) growth and poverty reduction.

[13] They explain this in terms of the industrial countries having a much larger stock of non-FDI liabilities, but also because of the irrelevance of original sin i.e. being able to borrow in their own currencies, and avoid currency mismatches. Such currencies support long-term markets, thereby limiting maturity mismatches.

Since foreign buyers of exports may provide the demand for upgrading products, as well as invite some level of technical assistance, best practice could be transmitted across borders. FDI is a powerful agent of this transmission, because it involves the import of improved technology, but also because technology licensing allows countries to acquire innovations. FDI is an embodiment of the various forms of best-practice transfer. Although there is a dearth of explicit tests to show which mechanism for cross-border transfer is best, and under what conditions such transfer will be desirable, a number of studies have shown that foreign owned firms perform better than their domestic counterparts. For example, this has been shown to be the case in Venezuela (Aitken and Harrison, 1999); and in the Czech Republic (DJankov and Hoekman, 1998).

FDI plays an important role in the domestic diffusion of best practice, for example through subcontracting arrangements. Klein and others (2001), argue that the ultimate impact of foreign investment on domestic growth depends not only on the performance of foreign-owned firms, but also on the diffusion of new practices through the economy. This diffusion however depends on the way domestic markets work, irrespective of the nationality of the owners. If small firms fizzle out, and the rate of turnover is consistently large, the effects of diffusion are dampened. When smaller firms survive and grow into larger firms, they provide credit to subcontractors as well as technical assistance. This is beneficial in countries were financial markets are not well developed and where firms which are not politically well developed are rationed out of the market.

The work of Lensink and Morrissey (2001) is insightful for two reasons: (i) they address the issue of FDI volatility; and (ii) they also took a look at its prospects for facilitating economic growth. They identify several transmission mechanisms. They found that FDI positively affects growth by decreasing the cost of research and development (R&D) through stimulating innovation. When FDI is uncertain, they observe that the costs of R&D are uncertain, and this will negatively affect the incentives to innovate.

The World Bank reports that the productivity benefits of capital flows through the transfer of technology and management techniques are significant in countries where a developed physical infrastructure, a strong business environment, and open trade regimes have facilitated the absorption of those flows.[14]

Apart from the focus on the environment, the issue of volatility/reversibility has gained some consideration in the literature. Lensink and Morrissey (2001) find that although FDI has a positive effect on growth, the impact of volatility on growth is negative. There are various reasons why volatility may be detrimental to growth. Two important reasons are cited: (i) when FDI flows are uncertain, the costs of R&D become uncertain; and (ii) the uncertainty of political and economic stability, which impinges on FDI flows. Economic shocks are defined to have an income effect, which if persistent will tend to reduce growth. Such shocks may be external (terms of trade of financial crises emanating from capital flows), or natural such as draught or floods. There is doubt as to whether it is

[14] Global Development Finance, 2001, p. 59.

volatility per se that affect growth or whether volatility captures the growth-retarding effects of unobserved variables.

The Lensink-Morrissey theoretical framework is set up such that FDI, as well as its volatility affects growth via the cost of innovation. It explains a possible channel by which the volatility in FDI flows negatively affect growth, and uses the expanding variety of products model to capture technological change. Three types of agents are accounted for: (i) final goods producers who rent capital goods; (ii) innovators who produce capital goods; and (iii) consumers. The World Bank data used provides coverage of twenty two years (1975-1997), with average values in cross-section and sub-periods panel estimates. 88 countries are sampled including twenty developed countries.

An equally much larger issue is whether the argument for unfettered capital flows could be made. It is now very apparent that externalities are associated with private agent's economic decisions, for which governments are needed to rescue economic agents from themselves, particularly in situations of moral hazard.

There is now a growing feeling in the literature that, when appropriate, controls must be used as stabilizers. The idea is that they can be used to mange risk rather provide ineffective long-term solutions. Some forms of controls are seen to be necessary to regulate inflation and outflows.

Massive amounts of inflows put pressures on domestic currencies. The inflows increase reserves, which are then used to buy domestic currencies. The domestic money base increases and without much expansion in production, too much money begins to chase few goods and services. Such controls become particularly necessary for countries with short-term debts.

Sterilization has been viewed as an effective weapon to regulate volatile flows. A successful sterilization will have the effect of reducing the monetary base (bank reserve and currency) to offset the inflow, at least temporarily. The classical form of such a policy has been the selling of Treasury bills to reduce the domestic component of the monetary base. Other methods include the encouragement of private investment abroad, allowing foreigners to borrow from the local market, or foreign exchange rate policies in forward markets.

2.3 *Capital flows, Investment, and Savings*

There have been some prominent studies on the effects of capital flows on savings and growth (Gruben and McLeod, 19980), and saving and investment (Bosworth and Collins, 1999; Mody and Murshid, 2002).

In their paper, "Capital Flows, Savings, and Growth in the 1990s," Gruben and McLeod (1998) examine the contributions that capital inflows may or may not make to growth in developing countries, as expressed by percentage changes in the gross domestic products of seven Latin American countries and eleven other developing countries. They examine

the longer term effects of various flows, by using data which begins in 1971, but also examined equity finance for the period 1988-94. The examination of equity finance was based on the work of Eichengreen and Fishlow (1995), who pronounced the era, as one of equity finance.

Their preliminary and tentative results show that increases in the share of FDI to GDP are positively and significantly related to subsequent changes in GDP. Changes in the share of portfolio equity capital inflows to GDP were also reported to have a significant positive relation to subsequent GDP growth. Their findings further indicate that despite the decline in the importance of bank lending as a medium of international flows of capital and the rise in the importance of portfolio and foreign direct investment, the growth impacts of the various types of capital flows did not seem to have changed significantly.

They find little evidence that capital inflows offset saving or vice versa, and that foreign direct investment and portfolio equity flows turn out to have positive and significant effects on savings, while other types of capital flows offer mixed and insignificant effects. They did find however, that outside Latin America, growth leads capital flows while in Latin America and for their sample as a whole capital flows lead growth.

As a preparation for the construction of models to link capital flows with growth and saving, Gruben and McLeod (1998), use a series of panel Vector Auto Regressions (VARs), or Granger Causality tests which offer preliminary evidence of links. Growth is

regressed on lagged values of growth and capital flows, or capital flows are regressed on lagged values of growth and capital flows.

The most significant econometric details of the work of Gruben and McLeod (1998) is provided by Instrumental Variables estimates. They came to the conclusion that there is little direct or indirect support for capital controls. They also found that FDI and portfolio equity investment has a strong explanatory power for growth in the sample countries.

A much more direct study of the relationship between FDI and growth is provided by Borensztein and others (1998).[15] They test the effect of FDI on economic growth in a cross-country regression framework, utilizing data on FDI flows from industrial countries to 69 developing countries for a period of about twenty years. They came to the conclusion that FDI is an important vehicle for the transfer of technology, but that it contributes relatively more to growth than domestic investment. Lensink and Morrissey (2001) confirm the positive impact of FDI on growth, in particular its contribution to stimulating innovation via research and development (R&D). Borensztein and others (1998) use various regularity conditions.

The economy produces a single consumption good according to the following technology:

$$Y_t = AH_t^{\alpha} K_t^{1-\alpha} \qquad (2.2)$$

[15] Borensztein, E., De Gregorio, J., and Lee, J-W., (1998) 115-135.

Where A represents the exogenous state of 'environment', H denotes human capital, and K, physical capital. The state of the environment is set up to capture various control and policy variables influencing the level of productivity in the economy. Human capital is assumed to be given by endowment, and physical capital is an aggregate of varieties of capital goods, so that capital accumulation takes place through the expansion of varieties. At each point in time the stock of domestic capital is given by,

$$K = \{ {}^{N}\int_{0} \; x(j)^{1-\alpha} \; dj \}^{1/(1-\alpha)} \qquad (2.3)$$

suggesting that the composite is a continuum of a variety of capital goods, a graded sequence of similarities in the middle and differences at the ends, with each denoted by x(j).[16] The total number of varieties is N, with the domestic firms having n share of the market, and the foreign n*. Cumulatively, N = n +n*. Among other assumptions not mentioned here, foreign firms are assumed to bring to developing economies advance knowledge in the production of capital goods already existing elsewhere.[17] If FDI facilitates growth, and growth is a precursor to poverty reduction, then there must be an important role for FDI in reducing the magnitude of poverty in poor countries.

The work of Bosworth and Collins (1999) extended the literature on capital flows and their implications. They substantiate the argument that for "many developing countries, the ability to draw upon an international pool of financial capital offers large potential benefits."[18] In these countries, where there are low levels of capital per worker, current

[16] This formulation has been credited to Ethier (1982)
[17] See Borensztein et. al., op.cit. for further discussion.
[18] Bosworth, B., and Collins, S., Brookings Papers on Economic Activity, 1:1999, pp.143

account deficits (net foreign resource inflows), can augment private saving and help these countries to reach higher rates of capital accumulation and growth.

They also argue that access to international capital markets provides the means to finance resource inflows, particularly when some kind of inflows (especially FDI), may also facilitate the transfer of managerial and technological know-how. Other studies have corroborated such a view.[19]

The idea is that when a country has constrained access to international capital markets, foreign resource inflow is tantamount to an increase in income which can be consumed or invested. Bosworth and Collins (1999) paid attention to the uses made of financial capital inflows, to find out whether they finance additional inflows of real resources (a current account deficit) or whether they are offset by capital outflows or increase in reserves. They also tried to find out how much goes to consumption and investment when there is a resource transfer.

The Bosworth and Collins (1999) study focused on three types of flows in fifty-eight developing countries for each of the years 1978-1995. They concentrated on three types of flows: FDI; portfolio capital; and loans. Their study shows that capital flows to developing countries shifted from loans to FDI for that period of time, but also that inflows differed by region. For example, in Latin America, prior to 1982, bank loans to

[19] Examples include Borensztein and others (1998), and Obstfeld, M. "The Global Capital Market: Benefactor or Menace?" Journal of Economic Perspectives, vol. 12, No. 4 (Fall 1998), pp.9-30.

governments or other banks were the dominant type of financial transaction. After the 1982 debt crisis however, loans could not be easily obtained and the focus shifted to repayment and the conversion of old debts into equities.[20]

The Gruben and McLeod (1998) and the Bosworth and Collins (1999) regression specifications take the endogeneity problem into consideration, by using the Instrumental Variables approach for estimation. The endogeneity arises from the interaction of investment and saving. Investment and saving may depend on capital inflows, just as the inflow a country receives is likely to depend on domestic economic activity. Bosworth and Collins (1999) use investment and saving as percentages of GDP devoted to investment and saving.

Country specific effects are given more consideration by Bosworth and Collins (1999) for several explanatory variables that vary across country and over time, and by so doing, depart from the methodology of the prior studies of Borensztein et. al (1998) and Gruben and McLeod (1998). These prior studies relied on pooled data sets. They argue that when fixed effect is not used, there is an implicit assumption that country-specific effects are either absent or uncorrelated with the regressors, and emphasize the dichotomy in data set being used.

[20] Correlation analyses in the Bosworth and Collins Paper show that there is very little tendency for inflows to be significantly correlated over time and across countries. As a result countries with large amounts of portfolio capital or loans have little prospects of receiving large amounts of FDI.

The effects of inflows are estimated in aggregated and disaggregated forms and Wilhelms (1998) came to the following conclusions, *inter alia,* for the disaggregated flows:

- a large proportion of capital flows to developing countries over the past two decades has been used to finance current account deficits and that this resource transfer is directed primarily into investment and not consumption.
- FDI has a large positive effect on both investment and saving, and that while FDI is associated with a significant increase in domestic investment, portfolio flows seem to have little or no impact.
- Disaggregated capital inflows (FDI, portfolio investment, and loans) are not significantly correlated with one another over time or across countries. So that there is a little tendency for countries with large amounts of portfolio capital or loans to receive correspondingly large amounts of FDI.

As a follow up on the previous studies of Gruben and McLeod (1998), and Bosworth and Collins (1999), Mody and Murshid (2002), studies the relationship between capital flows and savings and investment. They follow Bosworth and Collins (1999) in examining the relationship between long-term foreign capital inflows and domestic investment. They use substantive and econometric reasons for analyzing the impact on domestic investment.

Mody and Murshid (2002) contend, as well as Lucas (1990), and Summers (2000), that if an important element of underdevelopment is the scarcity of capital, then additional

investment in developing countries should have a high payoff. So that by easing restrictions on external flows, developing countries can hope to attract more international financing, which if, managed appropriately can increase investment, and consequently growth.

The major basis for the Mody and Murshid (2002) approach is that the link between foreign capital inflows and investment should in principle be easier to trace than the link between foreign flows and growth. They put forward the argument that growth is influenced over a longer period of time, and that it is likely to have strong feedback effects on foreign capital inflows, which render the endogeneity problem more difficult to resolve. In contrast, changes in investment are more immediate, allowing the use of higher frequency data and controls for endogeneity.

Like Gruben and McLeod (1998), and Bosworth and Collins (1999), Mody and Murshid disaggregated capital flows. They make the argument that the composition of capital flows matters since their impact on domestic investment varies across different types of flows. In addition, they contend that FDI is typically undertaken with "greenfield" projects in view, whereas portfolio flows are associated with the objective of sourcing lower cost funds and/or to diversify risk and hence, finance ongoing projects.

Mody and Murshid (2002) make a case for a different estimating method. Based on considerations of endogeneity and dynamism (making a connection between time periods), they use three year averages and avoid lagged dependent variables, where

significant serial correlation is associated with annual domestic investment data, and lagged dependent variables as explanatory variables, provide biased estimates.

In a sample of sixty developing countries, and using the similar explanatory variables as Bosworth and Collins (1999), they found that a strong evidence of a relationship between capital inflows and domestic investment has evolved over time. They also discovered that easing restrictions in the early 1990s have strengthened the relationship between FDI and domestic investment.

Mody and Murshid (2002) focused their inquiry on the following:

- Determinants of capital flows, 1981-1998.
- Impact of long-term flows on domestic investment, 1981-1998
- The relationship of capital flows and investment across regions and overtime.
- Regional variation in domestic policies and capital market openness.

The findings of Mody and Murshid (2002) were very similar to that of Bosworth and Collins (1999). The came to the following conclusions, inter alia:

- FDI has a large and statistically significant impact on domestic investment, though this impact has declined over the years.
- Aggregate long-term capital flows are less volatile, though volatility varies by type of flows. FDI is less volatile than portfolio flows, and even more so than bank loans

- Better policies improve access to flows, and especially for FDI, better policies tend to strengthen the foreign capital-domestic relationship.
- Procyclicality of investment is strong for East Asia and the Pacific, Latin America and the Caribbean, and South Asia, but not for Sub-Saharan Africa, and Middle East and North Africa.
- For countries which are weakly integrated, capital inflows are strongly correlated with domestic investment. Inflows of capital mainly supplement domestic saving. Countries of Africa, where domestic investment is constrained, fall into this category.

2.4 *An overview of the literature*

The literature on FDI and debt overhang is rich and overwhelming. There seems to be as much disagreement as there is consensus on vital issues or questions. Estimating methods, and coverage period have varied from study to study but some key arguments are now irrefutable.

The literature now gives credence to the view that given the right kind of environment FDI is not inimical to growth. It is therefore beneficial to promote FDI flows as an agent of development, particularly for poor countries. By promoting growth, there are excellent chances for reducing the magnitude of poverty in poor nations.

The evidence now suggests that FDI is a comparatively safer form of financing investment as oppose to portfolio flows, which are volatile. The bolted down theory is not however sacrosanct because investors can hedge their losses in financial markets.

Volatility necessitates some form of regulation, which must be geared towards stabilizing crises rather than providing long-term misguided solutions. It might therefore be necessary to sterilize large inflows, particularly when a country is overburdened with short-term debts.

Although it has not been proven conclusively that debt is a predictor of investment, it is fairly certain that servicing debt imposes a tremendous burden on countries and therefore discourages investment. The issue seems to hinge on what form of rescheduling process is being adopted. Most highly indebted countries have had very little success with debt rescheduling. Some economists see the debt crisis as a symptom of growth problems rather than a cause for the growth problems of the poor countries.

The literature seems to be in agreement that very large and unsustainable debt creates a probability of default. Although there is not a general agreeable method by which to accomplish this goal, there has been serious efforts over the years to reduce the debts of the most problematic debtor states by multilateral creditors. The Highly Indebted and Poor Countries (HIPC) Initiative is currently a case in point.

There are problems with estimating methods and specification. There is a problem of getting around endogeneity when dealing with variables of capital flows, just as there are problems with making models dynamic or selecting instruments to give the best estimation of data. Periodically, missing values pose some problems, albeit not decisive problems.

This work diverges from prior studies in the field, especially in its attempt to take a look at the implications of debt for FDI flows, while using non-HIPCs as a control group. The prior studies have generally focused on developing countries as a group, examined regional differences, or taken a look at the impact of total or disaggregated flows on domestic investment and savings. Apart from the emphasis on debt and FDI flows, I have also attempted to evaluate some of the results of capital flows for investment and saving in the HIPCs and non-HIPCs.

CHAPTER 3

THEORETICAL FRAMEWORK AND EMPIRICAL FINDINGS

I use two models in this work—that of Solow (1956),[21] and Sachs (1984) to show a link between: (i) FDI and growth; and (ii) debt and FDI. The Solow growth model illustrates how growth in the capital stock, growth in the labor force, and advances in technology interact to affect output. This interaction is built on the supply and demand for goods which ultimately affect capital accumulation. The supply of goods is based on the following production function:

$$Y = F(K, L) = AK^{\alpha} L^{(1-\alpha)}, \qquad 3.1$$

$$0<\alpha < 1$$

where output depends on the capital stock and the labor force. A fundamental assumption of this production function is that it has constant returns to scale. So that if capital and labor are multiplied by z, output will also be multiplied by z. Alternatively, if inputs are doubled, output is doubled as illustrated by 3.2.

$$zY = FA(zK, zL). \qquad 3.2$$

The form of 3.2 shows that output per worker (Y/L or y) is a function of capital per worker (K/L or k). In intensive form the production function could then be written as

[21] See the representation of the Solow model by Agenor (2000) pp.484-486, and Mankiw (1997), pp.82-120.

$$y = f(k) = Ak^{\alpha} \qquad 3.3$$

The intensive form makes it easy to analyze the behavior of an economy by relating capital per worker to output per worker.

The demand for goods in the model comes from consumption and investment, where output per worker y is divided between consumption per worker (c) and investment per worker (i). Hence,

$$y = c + i . \qquad 3.4$$

Consumption is a function of income, and since a fraction of income is assumed to be saved (s), and the other consumed, the consumption function takes the following form:

$$c = (1 - s)y . \qquad 3.5$$

Output per worker could then be written as;

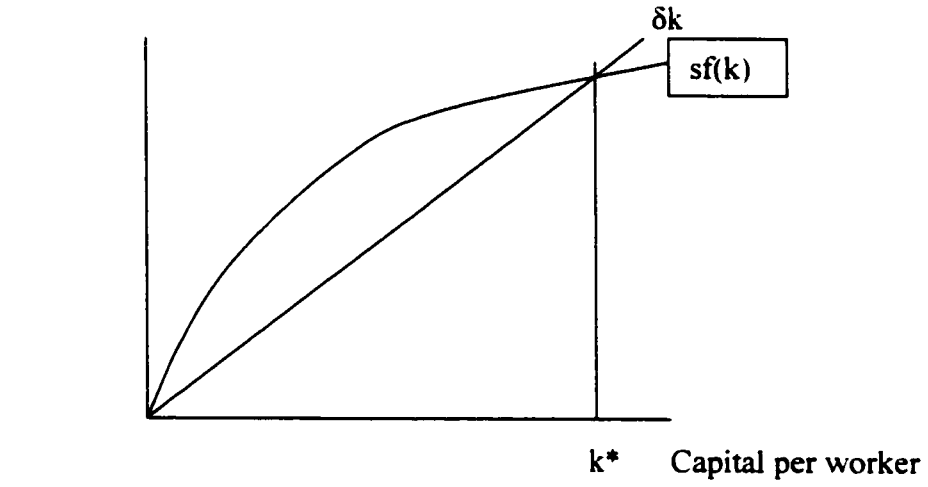
$$y = (1 - s)y + i \text{ or } i = sy = sf(k). \qquad 3.6$$

Change in the capital stock can impact growth in two ways: (i) investment, firms buy new plants and equipments; and (ii) depreciation, a constant fraction of capital wears out (δ). The change in capital stock per worker (Δk) then is defined as:

$$\Delta k = i - \delta k \text{ or } \Delta k = sf(k) - \delta k . \qquad 3.7$$

When the amount of investment is equal to the amount of depreciation, then $\Delta k = 0$, and the economy is said to be in a steady state, and the steady state level of capital is given by k^*. Graphically this can be posited as follows:

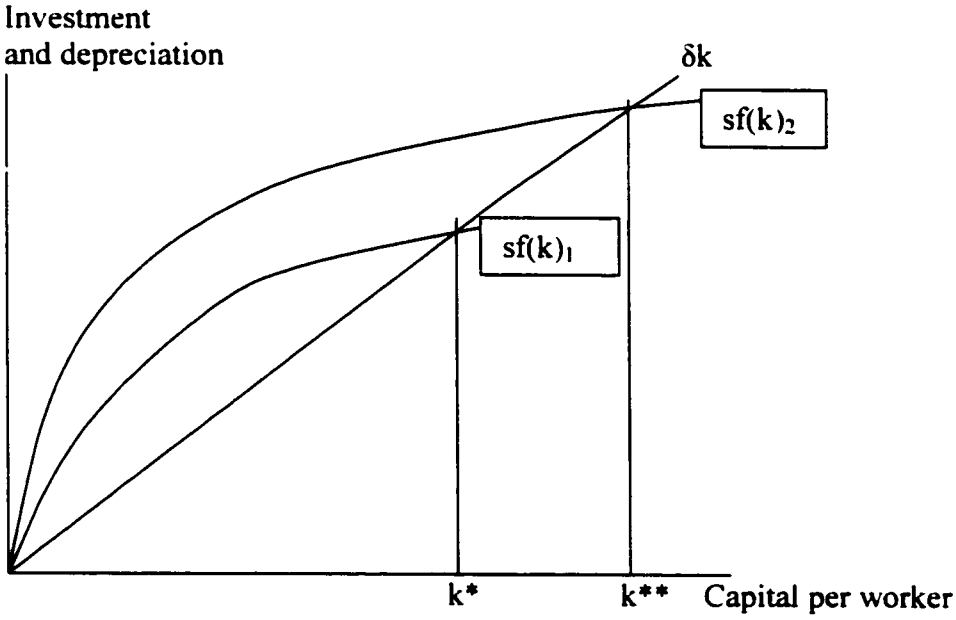
Figure 3.1



The steady state defines the long run equilibrium regardless of initial capital. At k^* an increase in the savings rate with constant capital stock and depreciation, will cause investment to exceed depreciation. The capital stock will gradually rise until the economy reaches a new steady state k^{**} shown in Figure 3.2. The key determinant then of steady state capital stock per worker and output per worker according to Solow is the rate of saving. Higher savings is tantamount to greater output per worker. The production

function shows that there is diminishing return—diminishing marginal product of capital, whereby each incremental unit of capital produces less output than the preceding unit.

Figure 3.2



3.1 *FDI and Growth*

FDI can help increase total factor productivity (TFP), through technology transfer. This is normally the case for much more open/liberalized economies. When there is technological progress for the same amount of inputs, there is more amount of output, and 3.1 could then be written alternatively as:

$$Y = AF(K,L) = AK^{\alpha} L^{(1-\alpha)}, \qquad 3.8$$

where A is a measure of the current level of technology or TFP. The form taken by 3.8 shows that if TFP increases by 1 percent, even if inputs are unchanged, the output will

increase by 1 percent. This technological change does not necessarily affect the marginal products of labor and capital. Using the log transform of 3.8 and differentiating with respect to time gives the following:

$$\dot{Y} = \dot{A}F + AF_K\dot{K} + AF_L\dot{L}. \qquad 3.9$$

An alternative form of 3.9 is:

$$\dot{Y}/Y = \dot{A}/A + F_K(AK/Y)\dot{K}/K + F_L(AL/Y)\dot{L}/L, \qquad 3.10$$

which, assuming perfectly competitive factor pricing, indicates that factors are paid their marginal product, so that the growth in output is given by the contribution of capital, the contribution of labor and growth in total factor productivity (3.11)

$$\Delta Y/Y = \alpha(\Delta K/K) + (1-\alpha)(\Delta L/L) + \Delta A/A, \qquad 3.11$$

where $\alpha(\Delta K/K) = F_K(AK/Y)\dot{K}/K$, $(1-\alpha)(\Delta L/L) = F_L(AL/Y)\dot{L}/L$,

$\Delta Y/Y = g_y$, $\alpha(\Delta K/K) = \eta_K g_K$, $(1-\alpha)(\Delta L/L) = \eta_L g_L$, and $\Delta A/A = g_A$

Euler's theorem on homogeneous functions, guarantees that for constant returns to scale function F(K,L), the sum of the share of the coefficients add up to one $K F_K/F + LF_L/L = 1$

Re-writing 3.11 in the form of 3.12 makes it easy to relate the growth of output per worker to the rate of growth of TFP

$$g_y = g_A + \alpha g_K + (1-\alpha)g_L \qquad 3.12$$

Expanding 3.12 gives:

$$g_y = g_A + \alpha g_K + g_L - \alpha g_L \qquad 3.13$$

Subtracting g_L from both sides and simplifying gives 3.14

$$g_y - g_L = g_A + \alpha(g_K - g_L) \qquad 3.14$$

Dividing through by L. where $\Delta L/L = g_L$ defines output per worker in terms of TFP, and the growth rate of capital per worker (3.15)

$$g_y/L = g_A + \alpha g_{K/L} \qquad 3.15$$

Using 3.15. once estimates of the growth rates of output, capital, and the labor force are obtained. and an estimate of α is provided, the rate of technical progress can be obtained by writing the function explicitly in terms of g_A (3.16).

$$g_A = g_y/L + \alpha g_{K/L} \text{ or } \Delta A/A = \Delta Y/Y + \alpha(\Delta K/K) + (1-\alpha)(\Delta L/L) \qquad 3.16$$

There are various ways through which FDI could facilitate growth as a result of openness and exchange. Trade leads to higher specialization and thus to gains in TFP, by allowing countries to exploit their areas of comparative advantage. When domestic firms take advantage of economies of scale, they are able to increase their TFP, by expanding the potential for new markets. FDI facilitates the diffusion of technological innovations and improved managerial practices through stronger interactions with foreign firms and markets, thereby increasing TFP. These factors which increase TFP facilitate an increase in output, without the increase in domestic savings which contributed to the increase in capital per worker depicted in Figure 3.2, as explained by the Solow model with a residual interpretation of growth.

The difference between $sf(k)_1$ and $sf(k)_2$ in Figure 3.2 can otherwise be perceived of as $sf(Ak)_1$ and $sf(Ak)_2$, the international best practice production function emanating from trade and exchange, assuming constant returns to scale in capital and labor.[22] Economies that are technically inefficient operate along functional relationship such as $sf(k)_1$. With openness, specialization and TFP emanating from FDI exchange, a country can move to a higher TFP level as A increases as $sf(Ak)_2$ and therefore experience growth in output.

Growth in East Asia has been an attractive example of TFP led growth, an indication of growth which is catching up with the much more advanced economies. For the 1970s and 1980s, the economic growth rates in East Asia and the Pacific were not only the highest, but also among the most stable of all developing countries. Hahn and Kim (1999)

[22] See *The East Asian Miracle*, p.68

discovered that East Asia was unusually successful in macroeconomic management, which provided the essential environment for private investment. In addition to the macroeconomic environment, they discovered that both primary and secondary education generated a social environment that made rapid human capital accumulation possible. It has also been argued that trade management played a crucial role in the growth of TFP. Trade was managed with some restrictions, as opposed to total liberalization in the 1960s. Export-promotion as opposed to an import-substitution policy was used as a development strategy. East Asia promoted the export of manufacturing goods, which improved technology and organization of enterprises. This fostered competition in foreign markets and generally reduced state-led development.

The second model used in this work is a two-period model largely associated with Jeffrey Sachs (1984). Although this model is generally seen as a two-period model, it could best be understood in terms of three periods. In an original period a debtor contracts a debt which becomes payable at a terminal period which is period two. This makes it possible, if necessary, for new debt to be contracted in period one, which also becomes payable in period two. The access to new debt in period one is contingent on the ability to pay both debts, without making one superior to the other, they therefore have a common "exposure." At the same time a government cannot agree to pay more than a fraction of the of the country's second period income in debt service. What the government would be willing to pay is given by δ, which is less than one, but greater than zero ($0< \delta<1$).

New borrowing is therefore contingent on a threshold condition that new creditors will be fully paid given already existing obligations. This is given by the inequality:

$$(1+r^*)D_1 < f(k_0 + I_1) - R. \qquad (3.17)$$

Where r^* is the world interest rate, D_1 is the debt contracted during the first period, k_0 is the initial stock of capital, I_1 is investment in period one, $f(k_0 + I_1)$ is investment in period two, and R is actual payments to the original creditors in period two.

If (3.17) obtains, new borrowing becomes a choice variable for a government because of the availability of funds at interest rate r^*. An important caveat however, is that for (3.17) to hold, there needs to be a critical mass, R^*, which is less than R.

According to Sachs, a government then maximizes a two-period discounted utility function of the following nature,

$$U(c_1, c_2) = u(c_1) + \rho\, u(c_2) \qquad (3.18)$$

Confronted with debt, repayment obligations, consumption and investment choices, a government acting as a social planner has to decide how much to invest and borrow during the first period, and consume during the second. The discount factor is given by ρ, which is less than one and greater than zero ($0< \rho<1$). The planner's decision is subjected to the following two period constraints:

$$c_1 = f(k_0) + D_1 - I_1 \qquad (3.19)$$

$$c_2 = f(k_0 + I_1) - (1+r^*)D_1 - R \qquad (3.20)$$

Consumption in period one is defined by c_1. Consumption in the first period is dependent on the original stock of capital, represented by $f(k_0)$, the amount of debt which is contracted in the first period, which is also new borrowing, and the amount of investment which is undertaken during the first period (I_1).

Second period consumption is dependent on the original capital stock and first period investment minus what will be actually paid to the original creditors (R) for debt contracted in the original period, minus the principal and premium (world interest rate) for the newer debt contracted during the first period $[(1+r^*)D_1]$.

If (3.17) holds, that is, if the creditors expect to be fully repaid, and the social planner obtains fresh credit to be paid at the terminal period, the first order conditions for a maximum are given by:

$$\partial L/\partial I = -u'(c_1) + \rho u'(c_2) f'(k_0 + I_1) = 0 \qquad (3.21)$$

$$\partial L/\partial D_1 = u'(c_1) - \rho(1+r^*)u'(c_2) = 0. \qquad (3.22)$$

When (3.21) is substituted into (3.22), and simplification is done to solve for investment, domestic investment is given implicitly as follows:

$$f'(k_0 + I_1) = 1+r^* . \qquad (3.23)$$

Substituting (3.23) into (3.22) defines first-period borrowing implicitly as a function of R. An increase in R reduces second period consumption since resources available for consumption in that period are reduced. So that if the burden on debtors accruing from original obligation is not written down total debt service in the second period exceeds the amount a country is willing to pay ($R = D_o > R^*$) and new creditors will not enter.

If $D_1 = d(R)$, differentiating equation 3.22 with respect to R, shows that as R goes up. consumption in the second period falls.

$$d/dR\ [u'(c_1) - \rho\ f'(k_0 + I_1)\ u'(c_2)] = 0 \quad (\text{where } d/dR = d'). \qquad (3.24)$$

Re-writing 3.24 and differentiating with respect to R yields.

$$u''(c_1)d' - \rho\ f'(k_0 + I_1)u''(c_2)\ [-(1+r^*)d' - 1] = 0. \qquad (3.25)$$

Expanding 3.25. collecting the common terms. and making 3.25 explicit gives

$$u''(c_1)d' - \rho\ f'(k_0 + I_1)u''(c_2)[-(1+r^*)]d' = -\rho\ f'(k_0 + I_1)u''(c_2). \qquad (3.26)$$

Factorizing 3.26 gives.

$$d'[u''(c_1) - \rho f'(k_0 + I_1)u''(c_2)(-(1+r^*))] = -\rho f'(k_0 + I_1)u''(c_2) \qquad (3.27)$$

Solving for d' yields[23]

$$d' = -\rho f'(k_0 + I_1)u''(c_2) / [u''(c_1) + \rho f'(k_0 + I_1)u''(c_2)(-(1+r^*))] \qquad (3.28)$$

Eliminating common terms provides the solution.

$$d' = -[\rho f'u''(c_2)] / [u''(c_1) + \rho(1+r^*) f'u''(c_2)] < 0. \qquad (3.29)$$

Where $-1 < (1+r^*)D_1 < 0$. Therefore 3.17 would hold only for $R < R^*$. An increase in R reduces second period consumption. If a country is constrained where $R = D_0 > R^*$. that is in the absence of a write-down of the initial debt, debt service in the second period will exceed the amount a country is willing to pay. All creditors will witness a shortfall and new creditors will not enter. In the absence of write downs (3.19) and (3.20) can be written alternatively as.

$$c_1 = f(k_0) - I_1 \qquad (3.30)$$

$$c_2 = (1-\delta) f(k_0 + I_1), \qquad (3.31)$$

where $0<\delta<1$, and δ is a fraction of debt that could be paid.

[23] See Agenor and Montiel (1999), pp. 572-574, where 3.24 to 3.28, are my derivations.

In a credit rationed regime, a government's only choice is over the level of first period investment, and consumption in the first period is dependent on the original stock of capital minus the amount of investment which is done in that period. This is given by 3.30. Second period consumption is dependent on the fraction of debt that could be paid, first period Investment and original capital stock (3.31). The first order condition in this case becomes,

$$-u'[\, f(k_0 + I_1)] + \rho(1-\delta)u'[(1-\delta)f(k_0 + I_1)]\, f'(k_0 + I_1) = 0 \qquad (3.32)$$

To show that debt forgiveness can increase investment and make both parties better off, let the Sachs solution to (3.31) be denoted by μ so that total payment to original creditors in this case equal to:

$$\Omega = \delta f(k_0 + \mu) < D_0 \qquad (3.33)$$

If the debt was written down, according to the model then (3.31) becomes,

$$c_2 = f(k_0 + I_1) - \Omega \qquad (3.34)$$

This gives a new first order condition:

$$-u'[\, f(k_0 + I_1)] + \rho(1-\delta)u'[(1-\delta)f(k_0 + I_1) - \Omega]\, f'(k_0 + I_1) = 0 \qquad (3.35)$$

By substituting (3.33) into (3.35) and calculating $dI_1/d\delta < 0$, investment is shown to increase when debt obligation is reduced from D_0 to Ω. This shows why governments are less likely to invest—creditors claim a share of investment when contractual debt is not fully serviced. The Sachs argument can be summarized and posited as such:

3.2 *Variables, Data and Data Transformation*

The data for this work is pooled, and largely based on that which was used by Mody and Murshid (2002) of *Growing Up with Capital Flows* (except for the data on debt). Two types of debt data are considered:- the debt service as a percent of exports of goods and services, and total debt to GDP ratio. The data is otherwise obtainable from *Global Development Finance* (2001), *World Development Indicators* CD-ROM (2002), *International Financial Statistics (2001), Exchange Arrangements and Agreements*[24], World Bank Country Policy Institutional Assessment Index, Gupta et. al (2000), Jones, (1998), and the Penn World Tables.

The data for this work is a combination of time series and cross-section, otherwise known as "pool/longitudinal data," for the period 1978-1998. Sixty countries are considered, of which twenty-three are highly indebted and poor (HIPCs).[25] The selection of the countries has been largely influenced by the availability of data and prior work done on the subject.

[24] See Mody and Murshid (2002), p.13.
[25] see Appendix I

Unlike other measures which tend to focus on inflows in general, I have focused on FDI, because of its comparative value to GDP growth. Both net and gross FDI are given consideration. Other forms of flows which are normally more liquid may raise domestic investment, increase imports or quickly fly away. In the real world, depending on the type of flows, flows may have no impact on the level of domestic investment.

A much stronger argument for FDI then is not only that of stability/persistence, but its ties to real investment in plants, equipments and infrastructure. The contrast here is that borrowing to finance consumption does not directly add to productive capacity necessary to generate export earnings. The FDI to GDP ratio provided by the World Bank provides wide coverage. The three year average is used for the period under review. This Mody and Murshid (2002) approach is consistent with some other studies including that of Lensink and Morrissey (2001).

Not all economists agree on the potential of FDI, or its degree of irreversibility. It therefore becomes a legitimate area of inquiry, or fair game for probing. For example, Classens et. al (1995) found that a high level of FDI seems to show high variability, which is a probable result of transfers between subsidiary and parent bodies outside of corporate walls.

Debt measure has always been a controversial matter. Some other studies have used as a natural measure of the HIPCs debt, the debt to GDP ratio, or the debt to GNP ratio Birdsall and others (2001). Easterly (1999) prefers the present value of debt service as a

ratio to GDP ratio to capture concessionality. This approach is fraught with difficulties of obtaining information. For example, the World Bank's Global Development Finance (GDF) reports an estimate of the present value of debt service for the latest year, while earlier reports reported three year moving averages going back to 1991. Some others use the debt to GDP ratio, for example, Cohen (2000), and Elbadawi et. al (1997). The IMF uses the debt to export ratio for its HIPC Initiative.

I have kept the natural way of assessing the HIPCs debt (debt to GDP ratio) which is common in the literature, but I have also diversified this measure to include debt as a percentage of exports of goods and services. The intention is to see if there is going to be conflicting results or any significant difference. But also to see what kind of effects these types of debts have on FDI and GDP growth. Concessional debts are also renegotiated to the benefit of the borrower and do not carry the full weight of the commercial rate, and are more meaningful to the type of inquiry desired. The alternative measure provides a way of assessing the impact of exports of goods and services on FDI through debt, but also to intuitively show the contributions of FDI to exports or the lack thereof. This captures the growth potential attributable in part to FDI.

Gross fixed capital formation, normalized by GDP is used for the data on investment. This form of investment is good for econometric and substantive reasons. It is easy to track the impact of FDI on domestic investment than growth, but also changes in investment are more immediate which allows for the use of higher frequency data. In All

capital flows data are normalized by a country's GDP and are reported in the World Bank's *Global Development Finance* (2001).

The endogeneity problem relating to modeling capital flows is now well acknowledged in the literature. This necessitates the use of instruments. Changes in interest rates in the United States (US) have been among some of the most important exogenous factors pushing investors to "emerging economies" in search of higher returns. In addition to US interest rates, I have used GDP per worker for HIPCs and developing countries, relative to that of the US in 1960, as well as education in 1995. World net and Gross FDI as a percentage of GDP, and net FDI as a percentage of GDP in low and middle income countries are also used as instruments. Other exogenous factors which have been identified, but not used in this work, include terms of trade shocks, and increases in international risk premia (Islam 2000).

The definition of crisis is based on the methodology used by Gupta, Mishra and Sahay (2000). They used five studies to define the crisis dummy. These studies are those of: (i) Eichengreen et. al (1995); (ii) Frankel and Rose (1996); (iii) Milesi-Ferretti and Razin (1998); (iv) Goldstein, Kaminsky and Reinhart (1999); and (v) Berg and Pattillo (1999). A year for which there is consensus among the five set of studies is considered to be a crisis year. When there is no consensus, they used the simple majority rule to make a determination. Special indicators are used to determine a threshold for the crisis characterization. These indicators include: (i) nominal depreciation of a local currency; (ii) depreciation combined with reserve loss and/or increase in the interest rate; and

(iv) an index of speculative pressure from a weighted average of exchange rate changes, interest rate changes and reserve changes. The threshold normally needs to be two standard deviation higher than the mean for a crisis.

The measure of policy is that provided by the World Bank's Country Policy Institutional Assessment (CPIA) Index, with ratings based on 20 items, which are assigned a 5 percent weight in the overall rating.[26] These indicators take into consideration economic management, structural reform, social inclusion and public sector management. They measure the qualitative strength of policies. This index has been used by others, such as Collier and Dollar (1999), and Mody and Murshid (2002). The policy measure is used by the World Bank as an incentive to foster poverty reduction and sustainable growth. The effectiveness of each element is measured against its impact on poverty reduction. The ratings range from 1 to 6, where 6 signifies a satisfactory policy with a proven commitment to good policy for three years or more. Intermediate scores of 2.5, 3.5, and 4.5, may be given, but not 1.5 or 5.5, may not be given.

As a matter of policy the Bank is interested in knowing whether countries have a consistent macroeconomic program, in terms of exchange rate, and monetary and fiscal policies to deal with inflation and internal and external imbalances. Fiscal policy is concerned with the size of fiscal balance and the composition of government revenue and spending. Using fiscal policy assessment is made of the capacity to provide public services for economic growth, and the possibility of maintaining a sustainable public debt. The management of external debt is used to determine whether a country can

[26] See appendix 2

manage its public debt (external and domestic), and service such debt into the future at the sustainable level. Two separate but related yardsticks of measurements are: (i) debt service capacity; and (ii) debt management capacity. Management of the economy and development program must reflect three elements: (i) technical competence; (ii) sustained political commitment and public support; and (iii) participatory processes which will espouse the views of stakeholders. A high score is given when all three of these components are realized. Trade and foreign exchange regime focus on trade restrictions and multiplicity of exchange rates, which essentially act as a tax on exports and imports.

Measure of financial stability is a matter of integrity. Policies inviting competition or their lack thereof are taken into consideration, for example barriers or non barriers to entry for domestic and foreign financial institutions. As a component of this criterion, the legal regime is also evaluated. Scrutiny is given to corporate governance, exit mechanisms for failed financial institutions, the effectiveness of collateral proxy, and the probability of money laundering. The objective of financial depth is to measure the mobilization of savings and financial intermediation. Three categories are considered: (i) monetary and credit policies; (ii) tax policies; and (iii) ownership policies.

Government borrowing requirements are evaluated to see if in fact public borrowing crowds out domestic investment. Tax policies assess reserve requirements, discriminatory tax policies, and penalties for loan loss (non-existing profits). Ownership deals with the degree of privatization/public ownership of financial institutions.

A logical extension of ownership is the competitive environment, whereby a state may restrict economic activities of the private sector by bans, and costly procedures to enter economic activities with no opportunity for legal redress. It is not generally expected for the state to be making allocative decisions on factors of production and distribution of finished products.

Policies and Institutions for environmental sustainability take into consideration pressures on the environment, and impact on income and health of the poor. Other components of the policy assessment include: -- gender discrimination, property rights and rule-based governance, mobilization of income, not just from taxes, and transparency, accountability and corruption of the public sector. The policy variable is therefore a comprehensive measure to assess the political, economic, and social implications of policies adopted. It provides a very useful function to gauge the effects of policies on FDI flows. Good policies are generally good for a variety of reasons, but in particular, they also serve as "pull" factors for capital flows. Other studies like those of Montiel and Reinhart (1999) have also concluded that domestic policies and conditions have become very important in determining the direction and magnitude. Economic reforms which are seen as pull factors will therefore attract and boost capital inflows. It is beneficial for reforms to be long lasting to prevent capital reversals and destabilizing consequences for recipient countries (Islam, 2000).

The data on schooling is based on that compiled by Barro and Lee (1993). The data set includes estimates of educational achievement for by age for over 126 countries. Of the

categories addressed, this work considers educational attainment for age twenty-five and above, which is based on the Barro and Lee (1993) concept of human capital. The data is more accurate for four major levels of attainment: no schooling, some primary, some secondary, and some higher education. The data does not however adjust for the quality of education, length of school day or year. The omission does not however necessarily negate information on the stock of human capital available for production.

Financial integration is an index based on the use of the following dummy variables: (i) openness of a country's capital account; (ii) the openness of its current account; (iii) the degree of difficulty to give up export proceeds; and (iv) the presence of multiple exchange rates for capital account transactions. The measure used takes values from zero to four, where zero indicates closed capital and current accounts, restrictions on export receipts, and multiple exchange rates. Four indicate an open regime. Flows to developing countries, are aggregate long term flows, denominated in FDI, Bank loans and Portfolio flows. Policies are seen as influential indicators of whether capital will flow into countries or not. Borensztein, De Gregorio, and Lee (1998), for example, find that FDI is positively associated with investment, but only in a setting with sufficiently high levels of human capital.

The proxy for financial depth is M2/GDP (liquid liabilities to GDP). This is an indicator of the development of the financial sector, since it provides a size of the financial sector to the size of the economy. It gives an indication of asset diversification and flexibilities in risk taking. Setbacks of this variable occur when there is a lending boom, and it is not

necessarily and indication that improvement in financial services will occur. The use of this variable is however less important for my own objective which is to track debt and FDI. To make some inferences, I split up the sample into two components when necessary—one for HIPCs and another for non-HIPCs (NHIPCs).

Pooled data poses problems of its own; fortunately methods have been developed over the years to deal with these problems. There are normally three major problems: (i) isolating the performance of an individual observation, and relating that observation to the endogenous variable, for which the fixed effects has now become very useful; and (ii) Inconsistent variance across observations, for which the GLS is helpful. However, it is normally conciliatory to know that the size of the pool normally minimizes the chances of multicolinearity.

Although the literature generally shows different empirical approaches, there are generally certain common pitfalls in estimation. One prominent problem has been the achievement of a careful balance between dynamics and avoiding endogeneity problem, for example using lagged dependent variable and avoiding correlation. Since macro-variables espouse persistence, it is necessary for specification to make room for dynamics to avoid biased estimates. This problem has already been acknowledged by Moody and Murshid (2002), Pesaran and Smith (1995), and Haque and others (1999). Moody and Murshid (2002) make a reasonable case for the three-year average used in this work, as a compromise between dynamics and endogeneity.

I make a follow-up on their finding by incorporating debt to see its effect on FDI. The objective is to evaluate the debt overhang argument by using a control group (non-HIPCs), and evaluating the relationship between debt and FDI in the HIPCs.

3.3 *Empirical Findings*

My empirical work deals with the following issues, under the broader rubric of seeing the behavior of capital flows in the HIPCs and non-HIPCs for the period 1978-1998:

- What type of relationship exists between FDI flows, policy and GDP growth?
- What are the effects of capital flows (including FDI) on investment and savings?
- What are the effects of policies and debt on FDI flows?

According to Claessens et. al. (1995), research on international capital flows has differed on whether it is more accurate to treat the flows as exogenous (with respect to the country in question) or endogenous, and that some authors, for example, Calvo et.al (1996) find low explanatory power. There has also been difficulty identifying exactly, the factors which determine capital flows. The much more general perspective however is that capital flows are normally dependent on conditions within recipient countries, in particular domestic investment or growth which leads to a problem of endogeneity.

In Table 1A, I take a look at some of the variables which impact GDP growth. I control for initial income to test the theory of conditional convergence, the idea that poorer nation will grow faster and catch up with the richer countries on the condition that they have identical income, savings rate, and efficiency among other things, in the medium run.

Income is kept at a constant rate for the period under investigation. The income of countries in the sample are denominated by the per capita US GDP, other important variables taken into consideration are net FDI, gross FDI and soundness of macroeconomic policies. Random and common effects estimation are used to estimate the impact of the selected variables on GDP growth. The estimating method is the Feasible Generalized Least Squares (FGLS).

All the coefficients for initial income are negative and significant as expected, indicating convergence. The other variables are also significant for the most part. Although gross foreign direct investment is not highly significant at the conventional level it is positive, and very strong.

Regressions 2.1, 2.3, and 2.4, show that domestic savings is not very significant for the countries in the sample. The contribution of domestic savings to growth is also negative as is expected, but insignificant. Although savings for the non-HIPCs in the sample is generally positive for all the regressions, saving is not very significant for these countries.

In the absence of a positive and significant contribution of savings to GDP growth, policy, schooling and FDI variables show a much more robust contribution to GDP growth for the HIPCs. The showing of the variables validates the argument in the literature that practices, and efficiency could facilitate growth in the absence of saving, which has been given considerable attention by neoclassical economists.

Comparatively recent theories are now emphasizing the contribution of total factor productivity, which is largely the result of technological progress and diffusion, widely regarded in the literature as the Solow residual. Trade and liberalization has also facilitated the progress in this area. Regressions 2.1, and 2.3 show that FDI is very significant for GDP growth in the HIPCs. Although the coefficients for the non-HIPCs do not exhibit the same strength, the Wald Test for difference in coefficient, fails to reject the null of coefficient equality. The coefficients for the non-HIPCs are not as significant

as those for the HIPCs, but show a very strong and positive relationship to GDP growth. There is also not a significant difference in the coefficients for savings.

Table 1. Determinants of GDP Growth, 1978-98

Dependent Variable: GDP growth rate (t-statistics in parenthesis)

GLS (3 year averages)

Independent Variables a/	**(1.1)**b/	**(1.2)**c/	**(1.3)**d/	**(1.4)**e/
1960 PPP GDP per capita	-0.05	-0.06	-0.06	-0.06
	(-2.97)	(-2.84)	(-3.93)	(-4.11)
Schooling at 1995	0.002	0.003	0.003	0.003
	(2.09)	(2.14)	(4.48)	(4.38)
Policy	0.12	0.02	0.02	0.02
	(7.16)	(6.66)	(8.79)	(9.71)
Net FDI	0.15	---	---	0.16
	(2.07)			(1.94)
Gross FDI	---	0.13	0.13	---
		(1.90)	(1.93)	
R-Squared	0.21	0.21	0.42	0.42
Adjusted R-squared	0.20	0.20	0.41	0.42
F-statistic	---	---	50.52	55.60
Durbin-Watson stat	1.98	1.98	1.93	1.91
Number of observations	**307**	**288**	**288**	**307**

a/ The benchmark for initial income is generally 1960, except for Sierra Leone, which is 1961, and Grenada, 1977. It is calculated by using GDP per worker relative to the US using purchasing power Parity (ppp). FDI is net foreign direct investment to GDP ratio, and FDIG is gross foreign direct investment to GDP ratio. Schooling is the average years of schooling of adults over 25 years of age.

b/ Estimation for this regression is done by using random effects (the intercepts are treated as random variables across pool members).

c/ Random effects estimation. d/ Common effects estimation. e/ Common effects estimation.

Table 2A. Determinants of GDP Growth, 1978-98

Dependent Variable: GDP growth rate (t-statistics in parenthesis)
GLS (3 year averages)

Independent Variables	(2.1)a/	(2.2) c/	(2.3)c/	(2.4)c/
GDP per capita $PPP	-0.06 (-4.40)	-0.07 (-4.32)	-0.08 (-5.94)	-0.07 (-6.06)
Net FDI		0.33 (-1.92)	---	---
Gross FDI in HIPCs b/	---	---		0.17 (1.68)
Gross FDI in NHIPCs	---	---	---	0.07 (1.28)
Savings in HIPCs*	-0.02 (-0.64)	---	-0.01 (-1.15)	-0.01 (-1.03)
Savings in NHIPCs	0.004 (0.28)	---	0.01 (0.67)	0.002 (0.17)
Policy in HIPCs	0.13 (5.18)	---	0.01 (7.83)	0.01 (6.97)
Policy in NHIPCs	0.02 (8.61)	---	0.02 (12.49)	0.02 (10.86)
Net FDI in HIPCs	0.13 (2.0)	---	0.13 (2.21)	---
Net FDI in NHIPCs	0.12 (1.64)	- --	0.12 (1.64)	---
Schooling 95	---	0.003 (3.03)	---	---
Schooling 95 interacting With net FDI	---	0.11 (2.94)	---	---
R-Squared	0.20	0.31	0.50	0.72
Adjusted R-squared	0.19	0.30	0.49	0.71
F-statistic	---	33.27	56.5	132.10
Durbin-Watson stat	1.9	1.78	1.90	1.87
Number of observations	**400**	**307**	**400**	**368**

a/ Random effects estimation. b/ For a list of HIPCs and non-HIPCs considered see Appendix .
c/ Common effects estimation.
* savings is gross domestic savings to GDP ratio.

Table 2B : Hypothesis Tests for Table 2A

Dependent Variable: GDP growth rate (t-statistics in parenthesis)

Independent Variables	(2.1)	(2.2)	(2.3)	(2.4)
The difference between Net FDI in HIPCs and Non-HIPCs a/	0.01 (0.101)	---	---	0.10 (1.10)
The difference between Savings in HIPCs and Non-HIPCs b/	-0.02 (-1.72)	---	---	0.08 (1.60)

a/ The Wald Test shows that the difference in the coefficient of net FDI to GDP growth for the HIPCs and non-HIPCS is not significant. Therefore the null hypothesis that the HIPC and Non-HIPC coefficients are the same is not rejected.
b/ There is also no significant difference in the coefficients of gross domestic savings to GDP growth in the HIPCs and non-HIPCs

In Table 3A I examine the relationship between net FDI and investment, and some of the determinants of domestic investment. I use the FGLS, and weighted two-stage least squares (W2sls) to do three sets of estimation. Regressions 2.1. and 2.2. show that both net FDI and gross FDI are significant to the growth of domestic investment. It is normally not very easy to find suitable instrument, to instrument capital flows and get around the endogeneity problem. I have used variables which are considered to be exogenous to the domestic conditions for capital flows. These variables include the net foreign direct investment of world flows, the world gross foreign direct investment, world gross capital formation. and net foreign direct investment for low and middle income countries. The FDI estimates are positive and robust for all regression estimates, both net and gross. This

finding coincides with that of Bosworth and Collins (1999), and Mody and Murshid (2002).

Of equal importance is the policy variable, which shows a strong and positive relationship to investment for all regressions. US interests rates, affect domestic investment negatively, for the HIPCs, but I did not find it to be significant for this sample. This finding replicates that of Mody and Murshid (2002). In Table 2B the null of equal net FDI and FDIG coefficients is generally rejected.

Better policies are normally seen as an invitation to capital flows. So that although developing and poor countries are not very well disposed to naturally attract foreign capital, increased openness and liberalization make it feasible for capital to leave more developed economies when the time is propitious.

Investors normally tend to focus on governments as the primary agents for attracting flows. This aspect is sometimes referred to as the sociocultural aspect, involving the government and the functioning of the government. Yardstick of measurement of a well functioning government and policy occasionally would involve, for example, the ease with which an institution can be changed, and the enforcement of laws. For most developing nations of the world expropriation has also become a lingering and problematic issue, which discourages investment.

Table 3A. Effects of FDI on Investment 1978-98

Dependent Variable: Investment a/ (t-statistics in parenthesis)

	FGLS (3 year averages)		W2sls (3 year averages)
Independent Variables	**(3.1) b/**	**(3.2) b/**	**(3.3)c/**
Financial depth (M2)	---	---	0.03 (1.93)
Policy lagged	---	---	0.01 (7.33)
Policy lagged in HIPCs	0.01 (5.01)	0.01 (5.37)	---
Net FDI	---	---	0.24 (2.76)
Financial integration	---	---	-0.00 (-0.28)
US Interest rates	---	---	0.00 (0.40)
Policy lagged in NHIPCs	0.03 (15.06)	0.03 (17.54)	---
Effects of US interest rates on investment (for the HIPCs)	0.000 (0.03)	-0.00 (-1.12)	---
Effects of US interest rates on investment (for the NHIPCs)	-0.000 (-0.61)	-0.00 (-1.12)	---
FDI in the HIPCs	0.49 (6.32)	---	---
Net FDI in the NHIPCs	0.95 (6.73)	---	
FDIG in the HIPCs	---	0.33 (4.74)	---
FDIG in the NHIPCs	---	0.63 (5.47)	---
R-Squared	0.93	0.94	---
Adjusted R-squared	0.93	0.94	---
F-statistic	763.5	882.46	---
Durbin-Watson stat	0.83	0.86	---
Number of observations	**352**	**323**	**352**

a/ Investment is still gross domestic fixed formation to GDP ratio. M2 includes demand deposits, money market mutual fund shares, and savings and small time deposits(less than $100, 00.00)

b/ common effects estimation.

c/ Instruments for regression 3.3 are World net foreign direct investment, world gross foreign direct investment, world gross capital formation, and net foreign direct investment for low and middle income countries. All 2sls are weighted 2sls.

Table 3B : Hypothesis Tests for Table 3A

Dependent Variable: Investment (t-statistics in parenthesis)

Hypothesis Tests (Wald tests)	(3.1)	(3.2)	(3.3)
The difference between FDIG in HIPCs and Non-HIPCs	---	-0.33 (-4.71) b/	---
The difference between net FDI in HIPCs and Non-HIPCs	-0.48 (-6.35) a/	---	-0.51 (-2.68) c/

a/ The null of equal coefficients is rejected. b/ the null of equal coefficients is also rejected.
c/ The coefficients are not equal. and therefore the null is rejected.

The ability to draw on a pool of capital could largely be seen as an alternative source of obtaining capital particularly for the poor countries which have very low levels of capital per worker. I did not find financial integration to be significant at the conventional level. but for the regressions dealing with FDI and investment the coefficient are positive albeit. not significant. Financial integration has provided avenues for nations with less capital to obtain capital and technology to facilitate GDP growth. Mody and Murshid (2002). however found that financial integration by itself could not necessarily enhance a country's chance of receiving more FDI. But rather that better policies may indeed improve a country's chance of receiving more capital. Indeed the policy variables reflect such a finding.

Table 4 Effects of Net FDI on Investment 1978-98

Dependent Variable: Investment a/ (t-statistics in parenthesis)

Independent Variables	(4.1)a/	W2sls (3 year averages) (4.2) b/	(4.3) c/
Financial depth (M2)	0.13 (10.21)	0.13 (9.63)	---
Policy in HIPCs	---	---	0.003 (1.04)
Policy in NHIPCs	---	---	0.02 (7.55)
Policy lagged	0.01 (3.03)	0.01 (3.16)	---
Net FDI	0.51 (5.28)	0.47 (4.81)	
Net FDI in HIPCs	---	---	0.46 (3.43)
Net FDI in Non-HIPCs	---	---	0.97 (7.02)
Financial integration	0.00 (0.15)	0.001 (0.62)	
US Interest rates	0.00 (0.98)	0.001 (0.89)	
Effects of US interest rates on investment (for the HIPCs)	---	----	0.00 (0.30)
Effects of US interest rates on investment (for the HIPCs)	---	----	0.00 (0.83)
Crisis	-0.01 (-0.91)	-0.02 (-1.26)	---
Terms of Trade	-0.00 (-0.95)	-0.00 (-1.53)	---
GDP lagged once	0.59 (9.72)	0.57 (8.64)	--
R-Squared	---	---	---
Adjusted R-squared	---	---	---
F-statistic	---	---	---
Durbin-Watson stat	---	---	---
Number of observations	**352**	**352**	**344**

a/ Random effects estimation. Instruments for regression 4.1 are World net foreign direct investment, world gross foreign direct investment, world gross capital formation, and net foreign direct investment for low and middle income countries. b/ Common effects estimation. Instruments for regression 4.2 are World net foreign direct investment, world gross foreign direct investment, world gross capital formation, and net foreign direct investment for low and middle income countries. c/ common effects estimation with instruments used for 4.2.

Table 5A: Effects of FDI on Savings 1978-98

Dependent Variable: Savings a/

	FGLS (3 year averages)	W2sls (3 year averages)
Independent Variables	**(5.1)b/**	**(5.2) b/**
Gross FDI HIPCs	---	---
**Gross FDI HIPCs sqred	---	---
Total portfolio flows	---	0.44 (1.03)
Gross FDI non-HIPCs	---	

FDI	---	0.35 (2.87)
Net FDI in HIPCs	0.08 (2.00)	
Net FDI in non-HIPCs	0.15 (1.11)	---

Bank Loans	---	-0.94
Bank loans in HIPCs	0.09 (0.60)	(-3.82)
Bank loans in NHIPCs	-0.54 (-7.28)	---
R-Squared	0.57	---
Adjusted R-squared	0.57	---
F-statistic	135.33	---
Durbin-Watson stat	0.72	---
No. of Observations	407	344

a/ Saving is gross domestic as a percentage of GDP

b/ fixed effects estimation, with two-staged least squares Instruments are.

Instruments for equation 5.2 are total world net foreign direct investment, world gross foreign direct investment, world gross capital formation, net foreign direct investment for low and middle income countries, global flows, and lagged FDI.

In Table 5A, I analyze the effects of capital flows on savings. The regressions in this table are also an attempt to replicate that of Bosworth and Collins (1999), to further evaluate their findings. They found that FDI makes a positive and significant contribution

to savings. The general theory is that it is savings augmenting, particularly for cash-starved countries. It is much easier to get this result from an aggregated rather than a disaggregated sample.

Table 5B : Hypothesis Tests for Table 5A

Dependent Variable: Savings

Hypothesis (Wald tests)	(5.1)	(5.2)
The difference between net FDI in HIPCs and Non-HIPCs	-0.07 (-0.60)a/	---

a/ t-stat. in parenthesis

The coefficients for FDI in HIPCs and non-HIPCs are not significantly different as reported in Table 5B.

Since the 1980s there has been a tendency to track the relationship between debt and foreign willingness to acquire claims on countries that are severely indebted. Both domestic and foreign economic agents become apprehensive about such acquisitions.

The relationship between debt and FDI may not be barely coincidental. Debtor countries benefit very little from additional investment. In additional when pre-existing obligations cannot be met in a timely manner it makes it very difficult for new obligations to be contracted. The debt of the HIPCs and the non-HIPCs seem to have the same effect on FDI flows.

Table 6A: Effects of Debt on Net FDI, 1978-98

Dependent Variable: Net FDI to GDP ratio
(t-statistics in parenthesis)
Estimation method: Feasible GLS (3 year averages)

Independent Variables	(6.1) a/	(6.2)a/	(6.3)a/
Total debt as a % of exports lagged in HIPCs	-0.01 (-3.74)	-0.01 (-1.57)	-0.04 (-10.96)
Total debt as a % of exports lagged in NHIPCs	-0.01 (-5.00)	-0.02 (-4.93)	0.03 (-14.07)
US interest rates	-0.001 (-1.32)	0.00 (2.43)	-0.001 (-0.72)
Financial integration for HIPCs	---	0.004 (8.15)	---
Financial integration for NHIPCs	----	0.01 (8.45)	0.00 (0.19)
Schooling in the HIPCs	----	0.001 (1.82)	---
Schooling in the NHIPCs	---	0.001 (4.2)	---
Total debt to GDP ratio in HIPCs	-0.01 (-13.97)	-0.01 (-3.9)	-0.02 (-16.1)
Total debt to GDP ratio in NHIPCs	-0.001 (-1.12)	0.001 (0.40)	-0.001 (-0.25)
R-Squared	0.31	0.33	0.46
Adjusted R-squared	0.30	0.31	0.46
F-statistic	24.73)	12.80	52.95
Durbin-Watson stat	0.77	0.89	0.82
Number of observations	**337**	**239**	**311**

a/ Common effects estimation.

Table 6B : Hypothesis Tests for Table 4A

Dependent Variable: Investment (t-statistics in parenthesis)

Hypothesis Tested (Wald Test)	(6.1)	(6.2)	(6.3)
The difference between Debt as a percent of goods And services in HIPCs and Non-HIPCs.	-0.003 (1.50) a/	---	---
The difference between Debt to GDP in HIPCs and Non-HIPCs.	-0.012 (8.56) b/	---	---

a/ The null of equal coefficient is not rejected. b/ The null of equal coefficient is rejected.

CHAPTER 4

CONCLUSION

The primary motivating factor behind this research is to study the empirical relevance of debt reduction to FDI growth. The approach has been to first take a look at the Work of Gruben and McLeod (1998) Bosworth and Collins (1999) and Mody and Murshid (2002).. The Mody and Murshid (2002) study is closely related to that of Bosworth and Collins (1999), which is to evaluate the effects of Capital flows on investment and savings.

I focus on FDI, which constitutes a great percentage of flows into the poor economies. I inquire whether FDI flows into the poor and indebted countries have the same effects as FDI into the non-heavily indebted and poor countries, and what are some of the factors that might make a difference on the chances of FDI flows. By so doing, I test the debt overhang theory which is largely attributed to Jeffrey Sachs(1984). I address the following issues for the period 1978-1998:

- What type of relationship exists between FDI flows, policy, initial income, schooling and GDP growth?
- What are the effects of FDI flows on investment and savings?
- What are the effects of debt on FDI flows?

To understand the dimensions of the literature. I first categorize it into sub-divisions for review:

- The reasons why capital is not flowing south.
- The pros and cons of FDI
- Capital flows, savings and investment.

To capture the impact of FDI on growth, and debt on FDI for the two sets of countries, I break up the sample into two groups using dummy variables for both. This enabled me to make inferences using a single sample to avoid a biased selection..

The main results of this work which are relevant to the purposes of the inquiry are provided in Tables 1, 2A, 3A, 4, 5A, and 6A. In Table 1 I examine the effects of FDI flows, policy, initial income, and schooling on GDP growth. The net FDI coefficient for the HIPCs is found to be positive and significant. This finding supports the theory in the literature that FDI could make a positive contribution to GDP growth. The finding of this relationship between FDI and GDP growth is very strong for all the regressions in Table 1. Initial income is negative and significant; suggesting that countries with less capital are converging. As income increases, incremental returns diminish. The effect of policy on GDP growth is generally found to be positive. I did find policy to be generally significant to flows, and GDP growth.

Schooling exhibits a positive and significant relationship to GDP growth. This finding is consistent with the conclusion reached by Barro and Lee (1993), that educational attainment has considerable explanatory power for GDP growth.

In Table 2A, I explore the relationship of policy, savings, FDI, and initial income to GDP growth. Again initial income turns out to be consistently negative and significant. As is expected for the poor countries, savings does not have a significant explanatory power for GDP growth. In actual fact the coefficient is negative, although not significant at the conventional level. This is interesting because there has to be an alternative explanation of growth. TFP fills the void.

It is normally an issue in growth literature to find out whether differences in gross savings rates across countries can account for a significant part of the differences in levels of development. The impact of savings may easily be exaggerated. Prescott (1997) makes such an argument. His empirical evidence does not support the proposition that rich countries are richer because they save a higher fraction of their output.

If there are diminishing returns to capital, with constant returns to capital, the growth rate of capital intensity would depend more on TFP (A), rather than the size of the capital stock. Consequently, to offset diminishing returns to capital, it is important for TFP to grow. As TFP expands, for any given capital stock, capital becomes more productive in the long-run.

The idea that TFP is an important engine of growth rather than a residual has rapidly gained widespread attention among endogenous growth theories. Although the consensus for its importance to growth is normally attributed to ideas, there is disagreement on the primary determinant of ideas. Emphasis range from investment in human capital to spending on research and development. For the poor and indebted countries, I have taken a look at the contribution of FDI and good policy as the catalysts for the diffusion of ideas and an increase in efficiency. Table 1 shows that both are positive and highly significant. Prescott (1997) makes a similar observation. He observes that TFP varies from country to country because of resistance to the adoption of new technologies, which is largely contingent on policy arrangement a society employs.

In Table 3A, I use FGLS, and Instrumental Variable estimation to examine the relationship between FDI and investment. The results of the regressions show that for the HIPCs, and non-HIPCs, there is a positive and significant relationship between FDI and investment. The weighted 2sls estimation for example, shows a positive and significant relationship between net FDI, past policies and domestic investment.

In Table 4, I investigate the results of weighted 2sls for net FDI, policy and financial depth (M2) on investment. As is expected net FDI has a positive and significant relationship with domestic investment for both the HIPCs and non-HIPCs. Financial depth is generally positive and significant. Policy does not fare too well for the HIPCs. However for the non-HIPCs policy shows a strong and significant relationship to domestic investment.

Table 5A takes a look at the impact of inflows on savings. The basic idea is to examine whether FDI is capable of increasing domestic saving, and therefore augmenting domestic savings. The role of net FDI for the HIPCs is crucial in this regard. I did not find the same result for the non-HIPCs. It is generally shown that FDI is more important than other flows to increase domestic savings. Indeed bank loans and portfolio flows are found to be insignificant to an increase in savings. Bank loans are however, positive for the HIPCs, but negative for the non-HIPCs.

The issue of whether debt impinges adversely on net FDI, is addressed in Table 6A. For all the forms of debt selected, the impact of debt on net FDI, as expected, turns out to be negative and significant for the HIPCs. The total debt to GDP ratio is even higher for the HIPCs. In Table 6B, I test the strength of the difference between debt as a percentage of goods and services for the HIPCs and non-HIPCs, as well as debt to GDP ratio. The null is rejected for no difference between debt to GDP ratio in the HIPCs and non-HIPCs. There seems to be an adverse relationship between debt and FDI for the HIPCs.

The basic findings of this work can therefore be summarized as such. The highly indebted poor countries are evidently starved of cash, and assuming savings is crucial to capital formation, there is a reliance on funds from abroad to augment the paucity of saving. FDI performs an integral role in GDP growth for the HIPCs, and contributes to domestic investment. The tests illustrate that growth in the poor countries is highly contingent on the adoption of good policies and the attraction of foreign capital.

The contribution of FDI and good policy is an indication of the future of contemporary theories which put emphasis on technology transfer, liberalization, the diffusion of knowledge and debt reduction. The theory that excessive debt discourages investment, gains appeal. To the extent that debt discourages investment, poor countries may be less exposed to the TFP benefits of rapid growth emanating from FDI.

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APPENDIX
BASIC DATA AND COUNTRY LIST

Country	Average debt as a percentage of goods and services 1990-1998	Average total debt to GDP ratio 1990-1998	Average Foreign Direct Investment to GDP ratio 1990-1998	Average GDP growth rate 1990-1998
Algeria	52	24	0.02	1
Argentina	37	26.5	1.9	5
Bangladesh	15	35	0.1	5
Belize	9.5	15	3	5
Benin*	15	13	2	3
Bolivia*	33	27	4	4
Brazil	37	31	1	2
Burkina Faso*	10	16	0	3.5
Burundi*	37	25	0.1	-1.2
Cameroon*	21	22.5	-0.1	-0.03
Central African Rep.*	10.5	86.5	-0.2	1
Chad*	7	43	1	3
Chile	23	10	4	7
Colombia	36	18	2	3.5
Costa Rica	15	23	4	4
Cote d'Ivoire*	30.5	40	1	3
Ecuador	26	20	2.5	3
Egypt, Arab Rep.	15	68	1	4
Gabon*	11.5	20	-1.1	3
Gambia, The*	14	26.5	2	3
Ghana*	28	32	1	4
Grenada	7	11	7	3
Guatemala	13	73	1	4
Guyana*	18	21	23	5
India	26	6	0.4	6
Indonesia	32.5	47	1	5
Jamaica	20	57	3.5	1
Jordan	17	27	1	5
Kenya*	29	13.5	0.21	2
Korea, Rep.	9	16	0.5	6
Lesotho	6	22	14	4
Malawi*	21	27	0	4
Malaysia	8.5	21	6	7
Mali*	13	47	1	3
Mauritania*	24	70	0.45	3
Mauritius	9	19	0.74	5
Mexico	29	42	2	3
Morocco	30.5	21	1	3
Nepal	9	24.6	0.13	5
Niger*	19	36	0.22	2

APPENDEX I
(CONTINUED)

Country	Average debt as a percentage of goods and services 1990-1998	Average total debt to GDP ratio 1990-1998	Average Foreign Direct Investment to GDP ratio 1990-1998	Average GDP growth rate 1990-1998
Nigeria	17	10	4	3
Pakistan	26	13.5	1	4
Papua New Guinea	25	28	3	4
Peru	27	16	2.5	4
Philippines	19	30	2	3
Rwanda*	17	17	0.2	2
Senegal*	17	36.5	1	3
Sierra Leone*	30	41.5	0.13	0.66
South Africa	11.5	7	0.53	1.3
Sri Lanka	10	52	1.2	5
St. Vincent	6	15	9.6	3
Swaziland	3	26	5	3.5
Syrian Arab Republic	8	22	0.5	6
Thailand	14	28.5	2	5
Togo*	8	23	0.31	2
Trinidad and Tobago	20	22	7.5	2
Tunisia	19	21	2	5
Uruguay	23	7	0.52	4
Zambia*	42	99	23	0.75
Zimbabwe	27	15	-0.17	0.56

* HIPCs considered in this study are taken from the World Bank list of 2000
Source: www.worldbank.org/HIPC/about/map/map.html

ABSTRACT

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Does Excessive Debt Discourage Foreign Direct Investment

in Highly Indebted Poor Countries?

Dissertation directed by Daryl McLeod, Ph.D.

This research investigates the impact of debt on FDI flows. Traditionally, the debt overhang literature has also viewed uncertain future debt payments as an implicit tax on future profits, and therefore a disincentive to new private investment, or procurement of earnings. Using a database assembled Mody and Murshid (2002), the impact of FDI on gross domestic savings, given various debt service ratios. Throughout I distinguish between countries classified as highly indebted poor countries and other non-highly indebted poor countries. The effect of debt on the poor country growth is also explored. My findings indicate the following: (i) FDI contributes positively and significantly to GDP growth in the poor countries. This corroborates the theory that FDI facilitates GDP growth in the poor countries, more so in this case than the non-highly indebted countries. (ii) FDI does not contribute positively and significantly to savings and investment for the heavily indebted poor countries. (iii) The forms of debt considered have a negative and significant relationship to FDI flows for the highly indebted and poor countries. This finding is not as robust for the non-highly indebted countries.

VITA

Christopher Ebun Samuel Warburton, son of Dionysius and Miriam Warburton, was born on June 16, 1960 in Freetown, Sierra Leone. After graduating in 1984, from Fourah Bay College, he taught History and Comparative Government at the West African Methodist Collegiate School, and Cardinal Educational Institute in Freetown. In 1986, he was appointed chair of the Department of History, Government, and Geography, a position he held till 1988.

He entered Fordham University in September 1992, and earned a Master of Arts degree in International Political Economy and Development in 1994, and a Master of Arts degree in Economics in 2002. During his time at Fordham he was inducted into the Omicron Delta Epsilon International honor society as a reward for hard work and outstanding achievement. While working toward his doctoral degree in Economics, under the mentorship of Dr. Daryl McLeod, he continues to teach Ancient Civilization, Economics, and Advanced Placement (AP) Economics, with outstanding results.