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DEBT OVERHANG AND NATURAL RESOURCES:
REVISITING THE
RESOURCE CURSE HYPOTHESIS

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Thesis submitted to the School of Business, Economics
and Informatics in partial fulfilment of the requirements
for the degree of Doctor of Philosophy

Birkbeck College, University of London

February 2014

DECLARATION OF AUTHORSHIP

I, *Yakama Manty Jones* , confirm that the work presented in this thesis '*Debt Overhang and Natural Resources: Revisiting the Resource Curse Hypothesis*' is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signature : _____

Date : _____

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May God bless you .

ABSTRACT

Growth literature presents evidence that resource abundant economies comparatively grow less than other economies, giving rise to the 'Resource Curse Hypothesis'. Many researchers have developed several theories to explain the 'Resource Curse' but there are very few explicit considerations of 'Debt Overhang' in these explanations. This study concentrates on the 'Debt Overhang –Resource Curse' link given the significant relationships between debt sustainability and other resource spending. It also implicitly seeks to test key competing theories. The key contribution is the evaluation of the 'Resource Curse' and 'Debt Overhang' phenomena simultaneously using mixed methods analysis.

This thesis consist of three complementary empirical studies organised in chapters under the 'Debt Overhang-Resource Curse' theme: A Panel Data Analysis of Debt Overhang, Natural Resources and Growth in 153 countries from 1970 to 2011; A Time Series Analysis of Sierra Leone's Debt Overhang, Natural Resource and Growth Experience from 1970 to 2011 and A Perceptions and Documentary Analysis of Debt Overhang, Natural Resources and Growth in Sierra Leone.

In Chapter Three, the 'Debt Overhang –Resource Curse' hypothesis was tested by estimating a system of simultaneous equations using the Generalised Method of Moments Three - Staged Least Squares estimator for the whole panel and carefully defined subsets. The results confirmed the 'Debt Overhang –Resource Curse' hypothesis in the case of least developed countries, mineral rich countries and petroleum rich countries although it failed to excel when the whole panel was examined.

The 'Debt Overhang –Resource Curse' hypothesis was also confirmed in Chapter Four, when a Structural Vector Autoregressive Model was estimated for Sierra Leone : a resource rich, heavily indebted poor country at the bottom of the Human Development Index, has recently received large economic growth projections. The results for Sierra Leone were further confirmed using cointegration and Granger causality tests.

The investigation continued with a perceptions and documentary analysis in Chapter Five. It investigated whether perceptions of Sierra Leoneans provide support for the Debt Overhang –Resource Curse hypothesis by estimating a structural equation model using Partial Least Squares, utilising data collected during a survey of mining communities. The results of the estimations were triangulated with findings from interviews, observations and documentary analysis. This analysis provided support for the hypothesis as well as some complementary theories within the Resource Curse debate.

This simultaneous assessment of the impact of both debt overhang and natural resources on growth went beyond quantitative investigations to provide proof of the link shared by these elements. It also made a rationale for a 'case-by-case' analysis of economic growth and development phenomena, resulting in policy recommendations with a greater degree of alignment.

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CHAPTER ONE

THESIS INTRODUCTION, RESEARCH GAPS, RESEARCH QUESTIONS AND RESEARCH CONTRIBUTION

1.1 THESIS INTRODUCTION

“.....natural resource endowments would enable developing countries to make the transition from underdevelopment to industrial 'take off'.....” (Rostow, 1961).

The above quote paints a clear picture of the growth expectations that come with natural resource endowments. However, there has been overwhelming but not unassailable evidence that some resource-abundant countries do not grow as rapidly as other countries and suffer from aggravated poverty, poor economic performance and, in some cases, political instability because of these endowments. Growth has been used to infer development, hence, the ‘Resource Curse’ hypothesis.

Over the years, many studies have expounded different theories in an attempt to explain the lagging growth experienced by these resource- rich economies. Political scientists have suggested several explanations for the resource curse, mainly through case studies. Economists have not only proposed varying rationalisations but have also tested their hypotheses on well selected comparative studies or large data sets. Some of these explanations include:

- The Dutch Disease theory (Prebisch, 1950; Sachs and Warner, 1999; Torvik, 2001);
- The International Trade Theory of Comparative Advantage(Krugman,1987; Amable, 2000; Thirlwall ,2002; Wright and Czeluta ,2004; Guillo and Perez-Sebastian, 2010; Mursheda and Serino, 2011);
- The Weak Sustainability explanation (Hicks, 1946; Gelb,1988; Atkinson and Hamilton, 2003);
- The Institutional Quality theory (Krueger et. al., 1992; Torvik, 2002; Brollo, 2010; Acemogul et al., 2002; Juel and Ross, 2011);
- The Political Explanation (Collier and Hoeffler, 2000; Ross, 2004, 2006; Basedu and Lay, 2009; Cotet and Tsui, 2010);
- The Volatility and Export Instability Theory (Sala-i-Martin and Subramanian, 2003; Cuddington et. al., 2007; van der Ploeg, 2009);
- The Debt Overhang Theory (Prebisch, 1950; Mazano and Rigobon, 2001) which greatly inspires this thesis.

Debt is a very crucial issue. According to the Harrod-Domar Model (1946), if debt can raise capital accumulation, it will lead to growth. Chenery and Stout (1966) explain in their Two-Gap Model that countries are faced with an internal gap between investment and savings and external gap between imports and exports. They need supplementary resources to fill these gaps and they often resort to borrowing. Given that some of the assumptions made by these models are unrealistic, some empirical studies have pointed out the harmful effects of debt on a country's economy. In the presence of debt, returns on investment are sub-optimal (Dooley, 1989; Borenzstein, 1990) and in other cases, debt crowds out investment (Serven and Solimano, 1993; Elbadawi et al., 1997). On the broad spectrum, debt adversely affects growth (Ndung'u, 1998; Reinhart and Rogoff, 2009; Balassone et al., 2011).

The world is slowly recovering from the financial crisis of 2007. One of the underlying causes of the crisis was the problem of debt sustainability at both the micro and macro levels of the economy. Although it started in one country, financial contagion occurred through financial intermediaries, stock markets and investors' perceptions of risk, which led it to be experienced in several countries with varying degrees of significance. Despite the potential negative impact on several economies, global coordination in response to the crisis was weak. The Overseas Development Institute (ODI) argued that developing countries are likely to face increased sovereign risk and growth challenges.

At the outset, the author of this research opined that resource-rich countries can emerge relatively unscathed from debt situations because of their wealth. This is because the issue does not rest upon being exposed to stock of debt but lies in sustaining the debt with the help of resource rents. Financial crises repeat over the years and with ever increasing scope of globalisation, translate into volatility of export prices, stock markets and currencies. This phenomenon led to this thesis' consideration of the effect of debt overhang in relation to natural resources.

One of the earliest studies to link natural resources with commodity prices is the work conducted by Prebisch (1950) and Singer (1950), who introduced the 'Prebisch hypothesis. They argued that resource-based growth would be negatively affected by a decline in the world prices of natural resources. This has influenced recent studies like that by Manzano and Rigobon (2001), which to the author's knowledge is one of the most cited studies clearly investigating the 'Debt Overhang- Resource Curse' link. Manzano and Rigobon (2001) explain that in the 1970s countries used their natural resources as collateral for debt. When commodity prices fell in the 1980s, these countries were left with a large amount of debt and a low flow of foreign income from the sale of resources with which to make repayments. Thus, according to Manzano and Rigobon (2001), the development problem is as a result of the debt-overhang problem.

Debt overhang and the resource curse have often been studied separately both prior and subsequent to Manzano and Rigobon (2001). Given the recent debt crisis and the evident lag in the growth of resource rich economies, this thesis seeks to test the two phenomena simultaneously. This study will start with an analysis of the phenomenon in a large dataset and would then concentrate on a single case, to present an in depth analysis of the debt overhang- resource curse hypothesis. The investigation will be carried out in three empirical studies which are all united under the ‘Debt Overhang- Resource Curse’ theme using mixed- methods analysis. Growth and debt theory provide the broad theoretical framework for all three studies. Data is from time series statistics sourced from various databases, a survey of four mining communities in Sierra Leone carried out by the author, a few interviews with selected Sierra Leoneans, the author’s observations of life in these communities and documents related to the extractive industry in Sierra Leone.

An introduction to this thesis, research gaps surrounding the main research area, research questions and the thesis’ contributions towards filling these gaps are contained in Chapter One. A review of the resource curse-growth, debt overhang-growth and debt overhang-resource curse literature is conducted in Chapter Two. This is followed by the empirical investigation of the debt overhang –resource curse phenomenon for the panel data of 153 countries in Chapter Three. The theoretical framework is presented in section 3.1. The methodology used to develop the system of equations is described in section 3.2. The system of simultaneous equations is then estimated using the Generalised Method of Moments Three - Staged Least Squares estimator for a panel of 153 countries over the period 1970 to 2011 and carefully defined subsets ranging from Heavily Indebted Poor countries to members of the Organisation for Economic Co-operation Development (OECD). The key results are explicitly concerned with the impact of natural resource rents and debt servicing on growth, but this impact is not isolated, as a few other transmission channels emerge from the results.

The results of the GMM estimation in Chapter Three are quite general. To ensure a clearer picture and better policy alignment, a case study approach ensues. Sierra Leone, a resource rich, heavily indebted poor country at the bottom of the Human Development Index and has recently received large economic growth projections, is the selected case. In Chapter Four, a time series analysis of Sierra Leone’s debt overhang, natural resources and growth experience from 1970 to 2011 is carried out by estimating a structural vector autoregressive (SVAR) model based of the theoretical framework formulated in section 3.1 of Chapter Three. The SVAR analysis is followed by cointegration and Granger causality tests in section 4.4.3 and section 4.4.4 to identify long term relationships between key variables and the direction of causality between them. The debt overhang –resource curse hypothesis is confirmed for Sierra Leone. Long term cointegrating relationships are revealed with strong Granger causality links.

Gross Domestic Product (GDP) is the most frequently used measure of output in quantitative studies. There have been concerns over measurement issues related to the GDP measure. Development economists have also argued that GDP growth does not automatically translate into development and the equitable distribution of wealth. Sierra Leone remains one of the world's poorest and least developed countries, and there is widespread frustration that the mining boom has done little to improve the lives of ordinary Sierra Leoneans. The aim is to examine whether resource rents in Sierra Leone trickle down to the masses, coupled with the goal of confirming whether the results of Chapter Four can be verified by the perceptions of Sierra Leoneans. In Chapter Five, this thesis firstly carries out a 'perception based' study by estimating a structural equation model described in section 5.1.3, using data collected from 1,339 respondents randomly selected from the communities where the four largest mining companies in the country are operating and the capital city. The results reported in section 5.2 confirm the debt overhang –resource curse hypothesis for the total sample. At community level, in addition to the debt overhang theory, in some cases a few other theories excel especially the human capital and quality of institutions concepts.

The analysis goes further in section 5.4 by scrutinising the mining agreements signed by the four companies under review with the Government of Sierra Leone, company reports and newspaper articles on the four mining companies within a framework covering management issues, financial updates, operational reports and activities enclosed in their corporate social responsibility practices. The findings from the document analysis are triangulated in section 5.5 with conclusions reached from interviews conducted, the author's observations of life in mining communities and the quantitative results of section 5.2 within socio-economic dimensions.

This thesis' simultaneous assessment of the impact of both debt overhang and natural resources on growth goes beyond aggregate quantitative investigations and provides support for the debt overhang –resource curse hypothesis. It makes a strong argument for a 'case-by-case' analysis of the debt overhang -resource curse phenomena and also encompasses effects on social welfare and economic development. The methodology of the mixed methods analysis utilised in this thesis can be applied to other countries and would result in much more aligned policy recommendations such as those presented in section 6.1 for the case of Sierra Leone.

1.2 RESEARCH GAPS

Institutions and organisations concerned with world development have over the years set certain goals and criteria that developing countries should meet. Some of these goals include the United Nations (UN) Millennium Development Goals, covering health, food security, social infrastructure and poverty reduction, and the criteria set by the Millennium Challenge Corporation (MCC). The common underlying factor in meeting most of these goals and criteria lies within institutional reform and

development spending. From the intuition presented by the Two Gap Theory, countries essentially need to borrow to fill the domestic fund gap needed to meet development goals.

Resource- rich countries are expected to maintain high sustainable incomes from their resource rents and are thus anticipated to reasonably meet most of these goals that are closely associated with development spending. From the evidence of their performance so far, based on general growth trends and success in meeting the development goals set by the UN and MCC, most resource- rich countries have been lagging behind. This thesis therefore seeks to investigate whether the servicing of debt used to supplement domestic revenue can explain the lagging growth faced by resource rich economies.

In Chapter Two, this study reviews both the resource curse and debt overhang literature. Several studies evaluate the link between natural resources and growth and external debt and growth, separately. Already established theories on the resource curse hypothesis complement one another, but still cannot completely explain potential resource curse, therefore a further harmonising theory that is relevant to current economic trends is needed.

The most recent economic upset is the debt crisis and the contagion is possible due to globalisation and increased international trade in currency, therefore, the effects of such a crisis have been felt in several countries. Debt overhang – natural resource – economic growth linkages are therefore highly relevant in complementing already existing theories within the resource-growth debate. Over the years, organisations such as the International Monetary Fund, the World Bank, African Development and other multilateral lenders have also supplemented government revenues by lending money to different countries.

To the best knowledge of the author, apart from Manzano and Rigobon (2001) there are hardly any other highly cited published empirical studies that investigate the debt overhang resource link. Several other theories ranging from ‘Dutch Disease’ to ‘Institutional theory’ have provided explanations for the resource curse hypothesis. As explained by Manzano and Rigobon (2001), most countries use their natural resources as collateral and when they struggle to repay, the debt overhang effect is felt. The ‘credit crunch’ of the recent recession, has brought debt issues faced by some countries to light. Hence, it is necessary to investigate how both debt issues and resource endowments simultaneously impact on economic growth. It is worth examining the past to make changes for a better economic future.

1.3 RESEARCH QUESTIONS

In order to fill the gaps described in section 1.2, this thesis seeks to answer the following research questions:

Chapter Three of this thesis seeks to answer the following questions:

- Based on current data available, does debt overhang lead to a resource curse?
- Is the debt –resource link conditional on development levels or specific to certain regions or economies?
- What other theories are significant in explaining the growth experience of the dataset under review?

Chapter Four aims to provide answers to the following questions:

- Does debt-overhang account for the resource curse in Sierra Leone?
- Do other resource curse theories apply to Sierra Leone?
- Is there a long term relationship between debt, natural resources and growth in Sierra Leone?
- What is the causal relationship between debt and growth and between resources and growth in Sierra Leone?
-

Chapter Five will provide answers to the following:

- What evidence of the resource curse hypothesis can be found in Sierra Leone?
- Is there strong evidence of debt overhang –resource curse perceptions in Sierra Leone?
- Do natural resources lead to economic development, an improved standard of living and reduced inequality in Sierra Leone?

Chapter Six aims to answer:

- How can Sierra Leone better manage its resource wealth?

Answers to these questions would help this thesis to make the contributions described in the next section.

1.4 RESEARCH CONTRIBUTION

The relevance of the impact of debt on growth cannot be stated strongly enough given the recent debt crises faced by many countries. This ‘Debt Overhang –Resource Curse’ investigation is therefore among the most relevant of the hypotheses currently driving the economic growth debate. This thesis seeks to offer a much deeper investigation of the phenomenon using current and robust econometric techniques. The overall research aim is to diagnose the past, examine the present and make recommendations for the future.

The impact of debt overhang on economic growth and the impact of resources on growth are two different phenomena. This thesis’ unique contribution is investigating how debt overhang and natural resources simultaneously impact on economic growth. However, the current research does not intend to simply replicate previous studies using a different dataset. Whilst its main focus is the debt overhang concept, the study will also implicitly test the effects of other key theories. This inclusion is based on the author’s belief that one theory cannot completely explain the resource -growth dynamics in isolation. The use of current statistics and an extensive data set in this research will shed light on the role of external debt on the economic growth of resource- rich countries and also complement previous studies on the resource curse.

This thesis will commence investigation at a general level, through a panel analysis of a large sample of 153 countries. The analysis will subsequently become more specific, when it carries out a case study enquiry which will provide a well-rounded methodology that can be applied to any other country. The type of micro-level analysis that is employed will result in much more aligned policy recommendations which will better highlight the impact of debt overhang and resources on key socio-economic indicators. The analysis therefore goes beyond economic growth since it also encompasses welfare and economic development.

The case study is specific to Sierra Leone, a country that is rich in natural resources, mainly precious minerals, and oil has recently been discovered. Sierra Leone is at the bottom of the Human Development Index, has experienced an eleven year civil war which is often attributed to the fight over the country’s diamond deposits and is one of the most heavily indebted poor countries. The post-conflict surge in extractive activities has resulted in projections that it will be one of the fastest growing economies in Sub-Saharan Africa. In the author’s opinion, these characteristics make Sierra Leone a very interesting case study. In addition, to the author’s knowledge, debt overhang- resource analysis of Sierra Leone is non-existent and with high growth forecasts and a history of high borrowing, such a study is necessary to evaluate the past and present and make recommendations for the future. The methodology applied will be applicable to other countries and will aid better policy formulation and implementation.

CHAPTER TWO

REVIEW OF THE LITERATURE

2.0 REVIEW OF THE LITERATURE

As explained in the general overview, this thesis seeks to evaluate the debt overhang and natural resources relationship by revisiting the Debt Overhang -Resource Curse link via analysing a large sample of countries and then concentrating on the experience of one country with outstanding characteristics. A review of the resources curse –growth literature, the debt overhang –growth literature and literature on how debt overhang and resource curse are intertwined and how their interaction affects growth and development follows. Both the theoretical and empirical literature are reviewed. This review will highlight relevant resource and debt literature and point out the gaps in the literature that provide motivation for this thesis’ revisiting of the Debt Overhang -Resource Curse link.

2.1 REVIEW OF THE THEORETICAL RESOURCE CURSE- GROWTH LITERATURE

The phrase ‘natural resource curse’ was created because of its paradoxical implication in both academic and policy circles (Brunschweiler, 2008). It is widely accepted that natural resources provide opportunities for economic growth. While natural resources have benefited countries such as Botswana and Norway, the same cannot be said for Sierra Leone and Nigeria where natural resources have contributed significantly to lagging growth, civil unrest and increased poverty (van der Ploeg, 2010).

In summary, much of the theoretical literature on the resource curse hypothesis is formed from varying explanations regarding the reason why certain resource rich countries enjoy sustainable economic growth and development, whilst others are still underdeveloped or experience lagging growth. These theories highlight the transmission mechanisms through which the economic growth and development of resource-rich countries may be affected by their natural resource endowments. The common theme among many of these explanations is the ‘crowding-out logic’. This logic follows that an abundance of or heavy dependence on natural resources ‘crowds -out’ other growth enhancing activities (Gylfason, 2002; Sachs and Warner, 1999; Mehlum et al, 2006). The policy problem is thus establishing the right mix for the optimal level of each activity and its corresponding policy. In broad classifications, the key explanations for the resource curse are: the Linkage theory which encompasses political factors, rent-

seeking activities, corruption and the quality of institutions (Wright and Czelusta ,2004; Romer, 1994); Neoclassical Growth theory which views savings and investment as the main channels of influence(Solow,1957; Swan,1957); the Dutch disease theory (Sachs and Warner, 1999); the Endogenous growth theory which explores human capital and debt linkages (Manzano and Rigobon, 2001) and a form of Eclectic theory which incorporates different transmission mechanisms and more than one theory into one model (Collier ,2009).

Dutch Disease Theory

One leading theory of the resource curse hypothesis is the ‘Dutch Disease’ explanation (Sachs and Warner, 1999; Torvik, 2001). In the early 1950s, structuralist economists such as Prebisch (1950) proposed that a worsening in the terms of trade of countries that are mainly exporters of commodities would negatively impact on their economic performance. In 1977, ‘The Economist’ coined the term ‘Dutch disease’ to describe the decline in the manufacturing sector in the Netherlands that followed the discovery of large natural gas deposits in the country in 1959. The discovery resulted in the Dutch guilder rising, making Dutch exports of non-oil commodities less competitive on the international market, causing a decline in the growth of the manufacturing sector, whilst the natural gas sector ,on the other hand was able to pay higher wages.

Corden and Neary (1982) formulated an economic model illustrating the ‘Dutch Disease’. Their model features a non-traded goods and traded good sectors: the booming natural resource sector (for example, oil, natural gas, gold, diamonds, bauxite, cocoa), and the lagging sector (generally manufacturing and subsistence agriculture). Corden and Neary (1982) explain that a resource boom led to a shift in labour from the lagging sector to the booming sector and increased spending due to the extra revenue brought in by the resource boom. Accordingly, as labour moved away from the manufacturing sector, the price of non-traded goods increased. In the long term, both of these outcomes can lead to manufacturing jobs being relocated to countries with lower labour costs, and eventually the non-resource industries experience stalling growth.

The drilling of North Sea Oil in Great Britain in the 1970s resulted in the value of the pound increasing, but the country fell into recession. British exports became uncompetitive and British workers demanded higher wages. In short, the British economy suffered a similar economic condition faced by the Dutch providing further validation of the ‘Dutch disease’ explanation of the resource curse. Against this background the ‘Dutch disease’ theory may provide an explanation for failed sustainable growth and development experience in certain resource- rich countries.

International Trade Theory

Closely linked to the Dutch Disease transmission mechanism explanation is the International trade theory postulated by researchers such as Smith (1776), Ricardo (1817) and Heckscher-Ohlin (1936), which shows that every country has a comparative advantage in something. According to international trade theory, countries specialise in whatever sphere in which they possess an advantage. A competitive advantage in natural resource production causes most resource rich countries to specialise in resource - based production. According to Krugman (1987), this form of specialisation has positive supply side connotations for economic growth, as it enables the achievement of economies of scale. The Keynesian growth theory, on the other hand, postulates that the growth enhancing properties of specialisation are demand-driven (Kaldor, 1981; Amable, 2000; Thirlwall, 2002). The Keynesian growth theory suggests that natural resource production and export tend to have lower price and trade elasticities that restrict aggregate demand, productivity and economic growth (Amable, 2000). Resource based specialisation also limits the development of other tradable sectors. This form of specialisation is inefficient and is symbolised by the volatility of prices and interest rates, low wages and investment, weak real exchange rates and a large decline in welfare, hence the resource curse (van Wijnbergen, 1984; Matsuyama, 1992; Ross, 2005).

Crowding-Out Logic

Following from the ‘Dutch disease’ and ‘Competitive Advantage’ explanations of the resource curse, it is clear that a declining manufacturing or traded sector seems to be the market response to a resource windfall. The manufacturing sector stimulates economic growth and gains from ‘learning by doing’. If the discovery and exploration of natural resources results in a temporary worsening of competitiveness, the temporary loss of ‘learning by doing’ might mean that the manufacturing sector will not be able to fully recover when resources decline, leading to a resource curse in the long run. This temporary loss in learning by doing that eventually curbs economic growth can be demonstrated in a two-period, Salter-Swan model (van Wijnbergen, 1984). Based on this model, in an open economy, Matsuyama (1992) finds that if the manufacturing sector benefits from ‘learning by doing’, the economy moves resources away from the manufacturing sector towards agriculture, thus growth is limited. Assuming that spill-over effects from human capital in production are generated only by employment in the traded sector, the results of Sachs and Warner(1995) and Gylfason et al. (1999) indicate that exporting natural resources lowers employment in the traded sector, impeding learning by doing and eventually restricting economic growth

Endogenous Growth Theory

Continuing along the lines of the spill over effects of human capital, the endogenous growth theory states that long term growth depends on investment decisions, rather than technological progress.

Investment decisions in this case encompass expenditure on human capital formation, research and development. This theory explains that where knowledge cannot be internalised entirely, it spills over to the whole economy. Proponents of this line of thought include Wright and Czelusta (2004), who argue that investment in new knowledge contributes to the creation and extension of mineral reserves. In recent years, the returns on investments in knowledge of country-specific minerals have been high, and in well-managed resource economies, the production and reserve levels of extractive resources have continued to grow. Surprisingly, school enrolment rates and public spending on education tend to be low in resource-rich countries. Wright and Czelusta (2004), among others, theorise that the failure of resource rich countries to adequately invest in human capital has led to their poor economic performance. Some of these economies that experience lower than expected growth relative to their resource endowments have low levels of savings that can be invested in the future. This savings shortfall raises the question of sustainability. This paradigm is based on the assumption that different forms of capital are substitutable in principle and that only the total capital stock is important to “maintain the capacity to provide non-declining utility for infinity” (Neumayer, 2010).

Weak Sustainability Theory

Hartwick (1977) put forth the ‘Hartwick Rule for weak sustainability’: “Keep a country’s total capital stock at least constant to allow for sustained consumption over time and therefore invest into all forms of capital at least as much as there is depreciation of all forms of capital”. ‘Genuine Savings’ illustrates the combination of consumption and savings, which in theory can be seen as the reinvestment of dwindling natural resource capital into other forms of capital (Dietz et al., 2007). The concept of ‘Hicksian income’ states that a country should only consider the interest on its capital stock as income (Hicks, 1946). Combining the ‘Hartwick Rule for weak sustainability’ and the concept of ‘Hicksian income’, it can be concluded that countries are expected to consume the interest on their capital stock so that the capital stock remains constant over time. However, studies such as Gelb (1988), Auty (1993) and Atkinson and Hamilton (2003) reveal rather than save or reinvest their resource rents, resource abundant countries, consume their income from resource exports giving rise to a possible curse. Some Studies have shown that these economies fall into the vicious cycle of rent seeking.

Rent Seeking and Institutional Quality:

Recipients of resource rents often become so politically powerful that they can either obstruct economic reform or turn it to their advantage. The theory of ‘Rent cycling’ emphasises the relationship between the economy and politics in resource- rich developing countries. This theory grew out of an observation that natural resource rents, geopolitical (foreign aid) rents, and contrived rents affect government policy implementation (Tollison, 1982). Krueger et al. (1992) highlight the fact that resource rents can be disconnected from the activities that generate them, thus increasing the possibility of inciting political

contests for their capture. Consequently, resource rent flows strongly affect both the structure of the economy and the incentives of the political state (Lane, and Tornell, 1996; Torvik, 2002; Robinson, Torvik, and Verdier, 2006; Auty, 2007). Established rent-seeking, especially by the politically powerful, leads to corruption and inadequate governance, thereby crowding out social capital (Bhattacharyya, 2008; Dietz and Neumayer, 2007). These three effects adversely affect institutional quality, one of the main transmission mechanisms of the impact of resource endowments on growth and development.

The main indicators of institutional quality examined by the institutional theory of the resource curse include corruption, bureaucratic quality and the rule of law. Corruption reduces investment and its productivity (Murphy et al., 1993; Romer, 1994, Boycko et al., 1995; Leite and Weidmann, 1999). Addison, Le Billon and Murshed (2000) explain that in countries with resources, there is an increased probability of a malicious cycle of rent-seeking, mismanagement and even conflict. One version of the institution theory of the resource curse is based on a version of the career concerns model of political agency (Brollo, 2010). Political candidates have career concerns, varied political abilities and diverse opportunity costs of entering politics. Brollo (2010) explains that the current leader faces a trade-off between using public resources for personal gain (corruption) and using the resources to maximise the likelihood of re-election. The trade-off depends on the quality of existing institutions.

A wider political-economic result of rent seeking is the 'Rentier effect'. Rentier states rely on resource revenues, where the government is the principal recipient of these rents and thus lack the incentive to develop policies that promote alternate sources of state revenue such as taxation (Isham et al. (2003). According to theory of the 'Rentier state', corruption, authoritarianism, and economic stagnation are characteristics of the Rentier political economy (Hazem Beblawi, 1990; Karl, 1997; Ross, 2001; Basedau, 2009). Some Rentier states fail to implement plans to ensure the equitable distribution of resource wealth; the middle class fails to develop, and wealth is concentrated among a small percentage of the population and political elites (Chaudhry, 1997; Acemoglu et al., 2001; Auty and Kiiski, 2001).

Conflict

In some cases authoritarian regimes and ever increasing income gaps result in conflict. Natural resources provide both reason and opportunity for conflict. They also indirectly create institutional and economic instability. Humphreys (2005) identifies possible causal mechanisms for the onset of conflict: 'greedy rebels', 'greedy outsiders'; the 'grievances' of social groups, price shocks, uneven distribution of revenues and natural resources providing the means of finance for rebels. With conflict comes a breakdown in the rule of law, accountability and governance; this vicious cycle leads to failing growth and development and eventually a resource curse.

Volatility

Another theory that attempts to explain why some resource rich countries fail to experience sustainable growth is 'volatility'. Volatility covers the variability of resource revenue (Cuddington, Ludema and Jayasuriya (2007); commodity prices (Prebisch, 1950; Sala-i-Martin and Subramanian, 2003) and exchange rates. This theory compares the gains from a temporary high income against the adverse effects of an inconstant resource income. Resource- rich countries concentrate mainly on exports but the effect depends on the type of resource. Agricultural exports are relatively price-inelastic in demand and subject to supply shocks. Mineral exports, on the other hand, have inelastic prices because their demand and supply are sensitive to economic activity. Terms of trade variations are larger for mineral rich countries making them even more susceptible to fluctuations in export prices and revenues.

These theories typically predict that the effect of natural resources on growth should unmistakably be negative. It should, however, be noted that all the theories put forward to attempt to explain the resource curse hypothesis are not mutually exclusive. There is no single explanation of what generates a 'blessing' rather than a 'curse'.

2.2 REVIEW OF THE EMPIRICAL RESOURCE CURSE – GROWTH LITERATURE

The empirical resource curse literature review considers the body of work based on the theoretical explanations already described. Many models estimated by these empirical studies are founded upon different theories of the resource curse and include variables that are expected to capture the transmission mechanisms described by theory. In many cases, other channels are also incorporated into the regression model as control variables.

Selected studies providing support for or arguments against the Resource Curse Hypothesis:

The term 'resource curse' was first used by Auty (1993) who found failures in resource-led development. According to Auty (1993), the general assumption is that resource wealth is more harmful to the economy in the early and low-income stages of economic development than latter. Auty (1993) thus concludes that resource-rich countries not only fail to benefit from resource endowment, but they their performance is also weaker than resource poor countries, hence the 'resource curse'.

Sachs and Warner (1995) pioneered the empirical study of the growth experience of resource- rich countries founding a negative statistical significant relationship between natural resource dependence and economic growth. They show that resource rich countries even after controlling for initial income

per capita, investment, openness and rule of law, on average, grew less during 1970-89. Following Sachs and Warner (1995), an increasing body of research including Gylfason et al. (1999), Rodriguez and Sachs (1999), Gylfason (2001), Sachs and Warner (2001) and Auty (2001), have found that countries that are rich in natural resources have a tendency to display relatively low rates of economic growth.

Most studies, such as those by Auty (2003) and Sachs and Warner (1995) argue that all resources are cursed. As estimation methods and data availability has improved, others such as Atkinson and Hamilton (2003), Sala-i-Martin and Subramanian (2003) Bulte, Damania and Decon (2005), Mehlum, Moene and Torvik (2006) have found that the curse is attributed to specific resources, commonly minerals.

Collier and Goderis (2007) use a panel cointegration approach to analyse data for countries from different regions from 1963 and 2003, to unravel the short and long term effects of commodity prices on growth. They find a strong indication of the resource curse hypothesis. Specifically, commodity booms are found to have positive short-term effects on output, but adverse long-term effects. In general, the results of their research support the view that commodity booms avert countries from productive activities and offer incentives for non-productive activities, such as rent-seeking and lobbying. They nevertheless find that none of the transmission channels proposed in the literature exclusively account for the resource curse.

Njikam (2008) tests the assumption that the growth effects of particular explanatory variables such as trade, openness and schooling are the same in resource-rich as resource-poor countries using regression analysis over the period 1970-2005. Similar to the classification structure used by Diao et al. (2006), Njikam (2008) identifies and compares six groups of countries: coastal, landlocked, mineral-rich, mineral poor, more-favourable agricultural conditions and less-favourable agricultural conditions. The results of initial growth regressions reveal that growth is more responsive to fiscal deficit reductions in mineral-poor countries than in mineral-rich countries. Institutional quality and openness to international trade are major determinants of growth in countries with less-favourable agricultural conditions, but may be insufficient for growth in countries with more-favourable agricultural conditions.

Butkiewicz and Yanikkaya (2010) test the Institutional, Dutch disease, Debt overhang, and Human capital explanation for the resource curse in a thirty-year panel data set of developed and developing countries. The results show that a mineral-resource curse exists only for developing countries. With respect to the various explanations of causes of the resource curse, they find strong support for the Institutional theory. However, the study failed to find any support for the Dutch disease and Debt-overhang explanations.

Sceptics of the resource curse hypothesis point out that many rich countries had abundant natural resources at the outset, for example, the United States of America, which is still one of the most developed countries in the world. Greasley and Madsen (2010) by means of post-1870 annual data and controlling for international knowledge spill overs, uncover a robust negative land resource productivity trade-off among major OECD economies and that mineral resource abundance has a positive impact on productivity. They conclude that differences in natural resource endowments among currently rich countries help explain their relative growth rates, but resource abundance does not translate into a universal curse or blessing. Conversely, Papyrakis and Gerlagh (2007) find evidence of a resource curse within certain regions of the United States.

Despite the results of a large number of studies indicating that natural resources have a negative bearing on economic growth via different transmission mechanisms, some studies, especially those with an improved measurement of resource abundance identify that natural resource wealth has a tendency to positively affect economic growth (Davis, 1995; Deaton and Miller 1995; Stijns, 2005; Stijns, 2006; Raddatz, 2007; Brunnschweiler and Bulte, 2008; Lederman and Maloney, 2008; Alexeev and Conrad, 2009).

One of the first papers to contest the negative resource impact on growth view adopted by Sachs and Warner (1995) was published by Davis (1995) who reviews the economic performance of a group of mineral-based and non-mineral-based economies. To overcome the possibility of biased results, Davis (1995) uses the Human Development Index and indicators such as education, mortality rates and sanitation to assess the reason behind the performance of the two groups of economies. The results show that mineral economies outperform non-mineral economies in terms of GDP per capita and a variety of human development indicators, implying no evidence of the resource curse. The only gap highlighted is between more developed mineral economies and the less-developed economies, showing that the resource curse maybe country specific. Similarly, Lederman and Maloney (2003) discover that resources positively affect growth. According to them, it is export concentration in resources that hurts growth as a result of a diminished accumulation of physical and human capital and a worsening of the terms of trade.

Wright and Czelusta (2004) analyse wealth by distinguishing between export revenues and resource endowments. They maintain that there is no curse by revealing that mineral extraction is knowledge based and highly technological. In the same year, after controlling for corruption, investment, openness, schooling and terms of trade, Papyrakis and Gerlagh (2004) conclude that natural resources have a positive effect on economic growth. However, they use a 'share of mineral production in GDP' as their measure of resource abundance. This ratio computes resource intensity rather than abundance and as

indicated by Sala-i-Martin and Subramanian (2003), an abundance of mineral and fuel resources may not generate the same economic result as abundance of other natural resources. Schliesser (2004) suggests there is little proof of the ‘natural resource curse’ and reveals that the empirical relationship between natural resource wealth and economic growth vanishes once the negative shocks on commodity markets are controlled for. Therefore, he opines that in the case of natural resource rich economies, the empirical result known as the ‘natural resource curse’ can be interpreted as a reflection of vulnerability to shocks and not as a growth defect.

Ding and Field (2005) estimate a recursive model. Their results indicate a negative link between human capital and dependence on natural resources and they conclude that the curse may be a result of a high level of resource dependence, which in turn is as a result of the poor development of human capital. Along similar lines, Lederman and Maloney (2007) also report the positive impact of natural resources on economic growth. On the other hand, similar to the findings by Sachs and Warner (1995), Collier (2007) establishes that resources have a negative long term effect on growth. Yet, once long term adverse effects are controlled for, an abundance of non-agricultural resources exhibits a positive impact on average cross-country growth rates.

Cotet and Tsui (2009) by means of a panel dataset covering worldwide oil discoveries, examine the consequences of oil rents on development and extractions using GMM estimation. They failed to find any robust evidence of a negative relationship between oil endowment and economic performance, conflicting with the oil-curse hypothesis. However, when extreme outliers in the dataset are dropped, a significant positive effect of oil discovery on economic growth is found. Brunnschweiler (2009) also fails to find any evidence of a damaging impact of oil on economic growth in a panel of 27 transition economies, contrary to those of Kronenberg (2004), that show there is a ‘‘strong negative correlation between natural resource abundance and economic growth’’.

Some economists argue that natural resources provide a low level of externality and, as a result, GDP per capita of resource dependent economies tends to grow at a slower rate. Rocha (2010) uses panel data regressions to address the issue of externality generation from natural resource exports. The study shows that natural resource exports generate positive externalities that are at least as high as the externalities generated by manufactured exports. This implies that resource- rich countries that manage to increase their exports at a fast rate do not suffer from the natural resource curse.

Dutch Disease Theory

This review now evaluates studies that are based on the ‘Dutch Disease’ theory of the resource curse. Studies based on this theory use various model specifications to show that the gains from natural

resources, through either a discovery of new resources or an unexpected increase in the price of the resources, crowds-out other sectors of the economy, especially manufacturing.

Sachs and Warner (1995, 1997, 1999, and 2001) ascribe the curse mainly to Dutch disease effects, and to a lesser extent, to rent seeking. Like Sachs and Warner (1995, 1997, 1999, 2001), Auty (1994, 1997, 2001) also finds evidence of a natural resource curse and concludes that all resources are cursed, especially due to the resulting effect of a reduced openness to trade and slower development of physical and human capital.

In a country specific investigation, Herbertsson, Skuladottir and Zoega (2000) examine the Dutch disease theory in Iceland, whose natural resource is fish. Herbertsson et al. (2000) find that primary exports have a positive short run relationship and a negative long run relationship with the secondary-sector. Their investigation reveals that the real exchange rate depreciates when primary-sector output increases and wages increase with primary-sector wages. They thus conclude that Dutch disease effects are transmitted through the labour market instead of the exchange rate. Sala-i-Martin and Subramanian (2003) explore the possibility of Dutch disease in Nigeria by studying the mechanism through the real exchange rate and the prices of tradable compared to non-tradable commodities. Conflicting with Herbertsson et al. (2000), they find no evidence of the Dutch disease in their study.

International Trade Theory

Guilló and Perez-Sebastian (2010) introduce natural input into a dynamic Heckscher-Ohlin model of international trade and growth. They test the hypotheses that natural resources can directly affect both long-run income and transitional growth, and that this effect can be positive or negative, depending on input elasticities. Guilló and Perez-Sebastian (2010) prove that the effect of resources on growth is positively significant. They discover that when the natural endowment triple, income per capita can increase up to 20%. Continuing along the lines of international trade, Mursheda, and Serino (2011) using dynamic panel data analysis show that countries specialising in the export of natural resource based products only fail to grow if they do not successfully diversify their economies and export structure.

Endogenous Growth Theory

The investment explanation based on the Endogenous growth theory is closely related to the trade explanation of the resource curse is. It is noted in the available literature that one of the important channels through which natural resource dependence affects growth is capital formation. Resource-rich countries are often inclined to over-concentrate developmental investment capital into their export sector (Karl, 1997; Ross, 1999; Stevens, 2003). Such countries are likely to not to efficiently invest in industrialisation eventually leading to slowed down growth rates (Stevens, 2003).

Gylfason and Zoega (2002) show that countries with low growth rates tend to experience low investment ratios, and it is the case that investment ratios are low in countries that are rich in natural resources. Similarly, Papyrakis and Gerlagh (2004) present results that indicate that natural resource abundance reduces the need for physical investment, thus negatively affecting growth. As usual, there is no general consensus on the investment- resource –growth link. Malik and Bond (2009), investigate whether there is a direct connection between natural resource abundance and investment and fail to find such a connection. They argue that it is the structure of exports that determines investment, and its impact on growth.

Conflict Theory

Several empirical studies have presented evidence that natural resource- rich and dependent countries seem to be more prone to lapse into violence. When studying peace and war, it is alleged that natural resources not only create indirect economic and institutional causes of violence, they directly provide both finance and motive for armed conflict. Countries with natural resource endowments often provide easily captured sources of financing for civil wars, rebel coup attempts and competition among warlords, as well as general looting and violence (Collier and Hoeffler, 2000; Stevens, 2003; Ross 2004; Lujala, Gleditsch, and Gilmore, 2005). This finding of a higher probability of domestic and regional conflict in resource abundant countries, especially point-source resources, is supported by several researchers including Ross (2004, 2006), Murshed (2004), Humphreys (2005), Fearon, (2005) and DeSoysa and Neumayer (2005). Conflicting with the resource-curse argument, Miguel, Satyanath, and Sergenti (2004) apply an instrumental-variable approach to examine the determinants of civil war using variation in incomes and they find that temporary negative economic shocks initiate civil conflict.

Fearon and Laitin (2003) and Fearon (2005), however, challenge these findings by claiming that the conclusions reflected omitted variables rather than a causal relationship. Ross (2004) also comments on the general conclusion of resources causing conflict after conducting a meta-analysis of fourteen econometric studies, and finding that primary commodities alone cannot be robustly linked to the inception and duration of civil war. According to Ross, the type of resource is crucial in determining the effect on growth or incidence of conflict. All the studies reviewed by Ross (2004) failed to show any significant relationship between agricultural commodities and violence. ‘Lootable’ resources such as diamonds, narcotics and timber are not found to increase the likelihood of conflict, instead, there is some evidence that they have some bearing on the duration of the conflict once it has broken out (Lujal et al. 2005). Along similar lines of thought, Brunnschweiler and Bulte (2008, 2009) test the impact of resource dependence and resource wealth on civil war. Both studies conclude that resource abundance reduces the likelihood of civil war onset, while resource dependence seemed to be a consequence rather than a cause of civil war.

Basedu and Lay (2009) attempt to elucidate why violence is not common to all oil-producing countries by employing multivariate cross-country regressions based on modified replication datasets. Using a sample of oil-exporting countries, they discover that, compared to oil-poor countries and contrary to the theory of the Rentier state, oil-rich countries succeed in maintaining peace and achieving internal stability. Similarly, Cotet and Tsui (2010) examine the effect of oil abundance on political violence using a panel dataset of over 100 countries between 1930 and 2003. They show that controlling for only country fixed effects removes the statistical association between oil reserves and civil war in a sample. They also reveal that oil reserves failed to influence other macro-political violence measures, such as attempted coups and irregular leader transitions. The study concludes that oil-rich nondemocratic countries have a large defence burden and that oil discoveries do not increase the probability of violent confrontations with the state.

Rent Seeking and the Institutional Quality Theory

Instead of presuming that institutional quality responds endogenously to resources, a considerable body of literature suggests that differences between successful and unsuccessful resource-rich countries lie in the quality of their institutions. The quality of institutions encompasses rent seeking, accountability, corruption and the behaviour of politicians. Leite and Weidmann (1999) point out that there is an important interconnection between resource abundance, lower economic growth and corruption.

One of the most recognised papers within the rent-seeking hypothesis of the resource curse literature is written by Tornell and Lane (1999), who show that, in an economy with several groups, when more income becomes available for redistribution as a result of increases in marginal productivity, each group requests higher income transfers. These demands may lead to tax increases greater than the net marginal productivity of capital, and thus growth is reduced. Income increases brought about by resource windfalls are expected to have this effect on growth.

Acemoglu et al. (2001, 2002) ascribe the quality of institutions to a country's initial conditions established by its colonial experience. They opine that, in cases where the colonial settlers worked in the overseas territory themselves, the institutional structure tended to promote wealth creation. On the other hand, if there were no permanent colonial settlements, 'extractive institutions' were set up to facilitate the extraction of wealth at the detriment of the indigenous people. Along this line of thought, Engerman and Sokoloff (2002), show that the variations in initial factor endowments play an important role in shaping institutions. In contrast to Acemoglu et al. (2001, 2002), Glaeser et al. (2004) establishes that human capital accumulation and policy choice determine institutional quality, which improves as a result of rising incomes and not vice versa. Brunnschweiler and Bulte (2007) find that countries with specific institutional designs fail to industrialise. This failure to develop non-resource sectors makes them dependent on primary sector extraction.

Robinson, Torvik and Verdier (2002, 2006) develop a theoretical model of the effect of resources on growth conditional on institutional quality and political incentives generated by resources. They observe that in countries with good institutions, the resource effect is positive because rent seeking and other perverse political incentives are alleviated. However, in countries with weak institutions, resources remain a curse as they succumb to rent-seeking behaviour. Easterly and Levine (2002) note a similar impact of resource endowments on development through institutions. Studies such as Boschini, Pettersson and Roine (2005) and Torvik (2006) present evidence that as institutional quality improves the consequence of resources changes from a curse to a blessing. Researchers like Acemoglu et al. (2003) Fatás and Mihov (2003, 2005) challenge the assertion that macroeconomic policy is a transmission mechanism for institutions. Acemoglu et al. (2003) argue that macroeconomic policy merely mirrors the quality of a country's institutions.

Using data from Sachs and Warner (1997), and adding a variable which captures the interaction of resources and institutions, Mehlum et al. (2002,2006) perceive that natural resources increase the national income if institutions are 'production friendly', but lower the national income if they are 'grabber friendly'. This dependence on institutional quality is also confirmed by Sala-i-Martin and Subramanian (2003), who discover that the mineral resource curse is due to negative effects on institutions, with the effect dependent on the particular natural resources being considered. This suggests that the curse may really apply to specific natural resources. Once they control for the indirect influence of resources on institutional quality, Sala-i-Martin and Subramanian (2003) find no proof of an independent effect of resources on growth. Murshed (2003) deduces that a rich endowment in natural resources only becomes a curse conditional on inappropriate policies being practiced. Badly chosen policies are the products of poor institutions.

Boschini et al. (2005) use the value of the production of precious metals and diamonds in their model when investigating the impact of poor quality institutions on growth, which the study finds to be significantly negative. However, Boschini et al. (2007) explain that resource endowment is not the sole determinant of this effect. They suggest that the 'appropriability of a resource' plays a significant role in the cause-effect dynamics. This captures the interaction between the type of resources and the quality of the institutions that a country owns. The concept of appropriability estimates the possibility that resources lead to rent-seeking, corruption or conflicts, eventually impairing economic development. The results from Boschini et al. (2007) indicate that in countries where resources are less appropriable, they can contribute to economic growth and vice versa where resources are highly appropriable. Collier and Goderis (2007) test the channels of the resource curse proposed in the literature and find that a substantial part of it is explained by high consumption, low or inefficient investment, and an overvalued

exchange rate. They also pinpoint that the resource curse is avoided by countries with satisfactorily good institutions.

Politics and Corruption

A few studies in economics and political science analyse the apparent resource curse through the lens of politics. This link encompasses rent seeking, state ownership, corruption and governance. It is not surprising that the literature on this topic has established that with a competent government, natural resources have no negative consequences for the economy and may have positive effects.

Asiedu and Lien (2011) empirically investigate the impact of democracy on foreign direct investment for resource exporting and non-resource exporting countries. Using data from 112 developing countries between 1982 and 2007, they estimate a linear dynamic panel-data model and opine that the impact of democracy on FDI depends on the size of natural resource endowments and not the type of resources. The study reveals that if the value of the share of minerals and oil in total exports is less than some critical value, democracy promotes FDI.

Libman (2011) studies how intra-national disparities in institutional quality and access to political decision-making affect growth in the Russian federation. The paper shows that subnational differences in the quality of institutions have some bearing on the effects of natural resources and concludes that if institutional quality is poor, resources have a negative impact on growth. Libman (2011) discovers that improving the quality of economic institutions is influential in making natural resources a growth factor. However, increasing the level of democracy, on the other hand, seems to cause resources to become harmful for growth, most likely because of stronger rent-seeking. Arezki and Brückner (2009) investigate the impact of oil rents on corruption and government stability for a panel of 31 oil-exporting countries between 1992 and 2005. Their results show that increases in oil rents considerably increase corruption and degrade political rights, while at the same time leading to a substantial improvement in civil liberties; however, they have no significant effect on measures of state instability.

Over the years, reports from the World Bank have shown that the organisation considers majority ownership by the state in productive enterprises to be inefficient and wasteful (1981, 1989, and 1995). Quinn (1999, 2002), by means of a state-level analysis, highlights that in sub-Saharan Africa, in most capital-intensive industries (mineral or oil exporting sector) wherein the state holds the majority share, more inward-oriented development policies result in reduced economic revenues. Weinthal and Luong (2006) and Quinn and Conway (2008) reach a similar conclusion; majority state ownership of a country's major mineral or oil export sectors can exacerbate the economic and political problems associated with mineral abundant economies. They explain that political elites manage the resource

sector with short-term political goals, regularly at the direct expense of long-term economic aspirations. Further support for this finding is provided by Robinson et al. (2006), through a theoretical framework which indicates that politicians over-extract natural resources because they discount the future too much.

Using cross-sectional analysis, a large panel data set and an extended period of time, Bussea and Gröning (2011) analyse the influence of natural resource abundance on selected governance indicators. The robust results reveal that exports of natural resources lead to a surge in corruption. For other governance indicators, such as law and order and bureaucratic quality, Bussea and Gröning (2011) fail to find any robust results on their impact on economic growth. Some studies like Wantchekon (1999), Auty (2001), Ross (2001), Herb (2003), Jensen and Wantchekon (2003), Stevens (2003), Smith (2004) and Juel and Ross (2011) concentrate on the impact of resources on the type of regime. Most of these studies conclude that authoritarian political systems are more likely in mineral-rich or oil-rich countries. Ross (1999, 2001) and Herb (2003) scrutinise the potential stabilising Rentier effects of resources on the prevailing regime and reveal that oil rents undermine democracy. Haber and Menaldo (2008) develop unique datasets to estimate within-country variance in resource dependence and regime types. Their results are contradictory to the findings of studies such as Ross (2000) and Herb (2003) that establish a negative relationship between natural resource dependence and democracy using pooled cross sectional techniques. Haber and Menaldo (2008) point out that there is no relationship between oil and mineral dependence and the undermining of democracy. Furthermore, Cabrales and Hauk (2009) propose a theoretical model which emphasises the behaviour and incentives of politicians, which clarifies that resource discoveries might be bad for democracy and could lead to revolutions, especially in countries with weak institutions.

Smith (2004) also investigates the stabilising Rentier effects in oil states, focusing on their impact on democracy. In contrast to studies like Ross (1999, 2001) and Herb (2003), Smith (2004) concludes that the level of democratisation does not explain regime stability. Haber and Menaldo (2009, 2011) also find little evidence that oil is harmful to democracy, and suggest that previous studies that believe oil to foster authoritarianism suffer from omitted variable bias and reverse causality. However, Collier (2007) opines that it is not simply whether countries are democratic that ensures a growth enhancing impact of natural resources. Without efficient monitoring of power, competition for resource rents can cause democracies to break down.

Resources and Development

Although economic growth is often assumed to translate into development and improved welfare, in many countries this has not been the case. Some studies have attempted to estimate the impact resource

abundance or dependence has on key development indicators in resource-rich countries. These development indicators often include health, life expectancy, infant mortality rates and human capital.

Case studies of the oil-exporting countries highlight the paradox of higher revenue from sales of a natural resource commodity leading to declines in welfare (Gelb, 1988, Karl, 1997).

One of the most widely accepted comprehensive estimates of development and welfare is the Human Development Index. Bulte, Damania and Deacon (2005), establish that, given an initial level of income, lower levels of human development are prevalent in resource-intensive countries. Their results indicate only weak support for a direct connection between resources and welfare and a significant and indirect link that operates mainly through the quality of institutions. Similar to Bulte et al. (2005), Pendergast, Clarke and van Kooten (2010) argue that rent-seeking leads to corruption and, in turn, affects wellbeing.

Besley and Kudamatsu (2006) reveal that populations are healthier under democracies because democracies were swifter to implement mortality reducing policies. They also find that mineral exporting countries have lower life expectancy. Following Besley and Kudamatsu (2006), Cotet and Tsui (2009) consider infant mortality and life expectancy over different periods, using data from the World Bank. In contrast with Besley and Kudamatsu (2006), Cotet and Tsui (2009) reveal that an abundance of oil had a negative effect on infant mortality and a positive influence on life expectancy between 1960 and 1980. Gelb and Grasmann (2009) show that focusing on only the physical gains from oil abundance may underestimate the welfare gain because, relative to non-oil countries, oil-rich countries gain more in health improvements. Bulte et al. (2005), among others, show that negative outcomes in several other measures of human welfare have also been linked to natural resource wealth.

Human Capital Theory

According to studies like Wood and Mayer (1998), Stijns (2006), Bravo-Ortega and de Gregorio (2007), resource abundance is not the main determinant of a country's growth potential, which instead relies on the stock of human and institutional capital available in the country to manage its resources. Studies suggest that Africa's low ratio of human capital to natural resources is a major determinant of its export structure, ability to diversify towards manufacturing and its shortfall in economic performance compared to Asia (Wood and Mayer, 1998). Gylfason (2000) highlights that inadequate attention and expenditure on education and development of human resources is key to explaining the resource curse..

Stijns (2006) evaluates the connection between resource abundance and the growth of human capital and finds there is a positive relationship between per capita rents from natural resources and human capital accumulation. This supports the findings of Davis (1995), but contradicts the results of Gylfason (2000). Stijns (2006) argues that the measure of resource abundance used by Gylfason (2000) is biased,

thus resulting in biased results on human capital. In a bid to escape the bias in the human capital variable, Bravo-Ortega and De Gregorio (2005) use panel data and instrumental variables to illustrate that a high level of human capital can offset the negative link between resources and economic growth. The main finding is that resources could impede growth in countries with low levels of human capital, but in economies with an abundance of human capital, natural resources could boost growth. Birdsall, Pinckney and Sabot (2001) conclude that countries with abundant resources experience lagging growth as a result of under- investment in human capital. Moreover, Lederman and Maloney (2007) reiterate this finding by explaining that countries such as Norway that have successfully utilised their natural resources for further development have done so by improving their levels of human capital.

Goderis and Malone (2011) estimate a two-sector growth model in which ‘learning-by-doing’ stimulates growth. They also explain the time path of income inequality that follows natural resource booms in resource abundant economies. Their study evaluates ninety countries between 1965 and 1999. They find that with a relatively unskilled, labour intensive, non-traded sector, a decrease in income inequality immediately follows a resource boom. Income equality increases steadily over time until the initial impact of the boom disappears.

Using cross-country regressions, Alexeev and Conrad (2011) examine the association between resource abundance and economic growth, incorporating variables to capture the quality of institutions, investment in human and physical capital, and social welfare (life expectancy and infant mortality) for all countries in the dataset. Contrary to most literature available, Alexeev and Conrad (2011) fail to find any substantial verification of a natural resource curse in all the countries. Only the ‘voice and accountability’ measure of institutional quality is found to be significantly and negatively affected by oil wealth.

Volatility Theory

Empirical investigations of the effect natural resources have on growth and development in some cases seek to evaluate the volatility mechanism. They examine volatility through commodity prices, trade shocks, resource revenues, fiscal policy and exchange rates. Van der Ploeg (2009) explain that it is a widely accepted fact that growth depends negatively on volatility and that the direct positive effects of natural resources on growth are dwarfed by the indirect negative effects through volatility.

Instead of volatility of the terms of trade, Ramey and Ramey (1995) investigate the connection shared by volatility of unanticipated output growth and the instability of commodity prices and growth using the Heston-Summers dataset. In their cross-country estimations, Ramey and Ramey (1995) discover evidence of a negative relationship between volatility and mean growth rates. This finding is also valid in a panel model that controlled for both time and country fixed effects. Building on the work of Ramey

and Ramey (2004), Koren and Tenreyro (2007) and Van der Ploeg and Poelhekke (2009) show that volatility is the crucial channel through which resource dependence influences economic growth. They find a statistically significant negative correlation between volatility and growth, providing support for Ramey and Ramey (2004).

Fatás and Mihov (2003, 2005) also focus on volatility instead of the share of government consumption to GDP. As in Ramey and Ramey (1995), the results of Fatás and Mihov (2003, 2005) indicate there is a negative correlation between a country's average per capita growth rate and output volatility, and also between income per capita growth and government consumption. Their results also reveal a strong positive correlation between fiscal policy volatility and output volatility. When institutions are controlled for, as in Acemoglu et al. (2003), 'fiscal policy volatility' remains significant in the growth regression, signifying that it is more than just a transmission mechanism for institutional effects.

Aghion et al. (2006) identify strong evidence of a robust and negative relationship between real exchange rate volatility and growth performance for eighty-three countries over the period 1960 to 2000. About a year later, Blattman, Hwang and Williamson (2007) carried out a thorough investigation of the growth performance of thirty-five countries during the historical period, 1870 to 1939. Their findings show that volatility is indeed harmful to the economic growth of commodity-dependent nations. Nelson (2008) approaches the volatility investigation by examining the impact of the volatility of export prices on growth in resource dependent economies. He points out that trade shocks have 'Dutch disease' characteristics and thus pose challenges for macroeconomic management.

Extending the investigation of Aghion et al. (2009), Van der Ploeg and Poelhekke (2009) show that when commodity prices are volatile, liquidity constraints increase, thus resulting in a decrease in innovation and a fall in growth. The results of Bleaney and Halland (2009) conflict with those of van der Ploeg and Poelhekke (2009), who find that volatility is the key transmission channel of the resource curse, and that it is the variability of resource prices rather than the level of resource exports that matters. In contrast to Fatás and Mihov (2003, 2005), they fail to find a significant relationship between the volatility of government consumption and institutional factors, but the relationship could, however, be explained by natural resource exports.

Technological Progress

Some studies highlight the possible positive effects of natural resource wealth on technological progress, especially in conjunction with high 'learning capacity' (Maloney, 2002; Lederman and Maloney, 2003). Welsch (2008) argues that studies in which the 'natural resource curse' is examined in an endogenous growth model base their foundations on the assumption of constant returns to capital as the source of sustainable growth, instead of taking into consideration the creation of knowledge

through research development (R&D). Against this background, using an endogenous growth model with natural resources and R&D-based technological change, Welsch (2008) finds an inverse relationship between knowledge creation and natural resource intensity, as well as between capital formation and natural resource intensity for a cross-sectional data set of 77 countries between 1965 and 1998.

The resource curse literature rests predominantly upon connecting relatively poor economic performance with countries with an abundance of natural resources empirically using different methodologies. The findings of the empirical studies vary and in some cases empirical issues are the reason. Most of these studies are based on the seminal work of Sachs and Warner (1995, 1997, and 2001) and are thought-provoking and theoretically relevant from a policy point of view, but suffer from a few shortcomings. The most common points of contention surround the availability of certain data and the measurement of resource abundance, differentiating between resource abundance and resource dependence and estimation issues. This research now evaluates some of the acknowledged empirical issues that affect the results of many studies in the resource curse literature.

Empirical Issues

The first issue is the operationalisation of the independent variable. Most studies fail to distinguish between resource abundance and resource dependence in their methodology (Van der Ploeg, 2009; Bond and Malik, 2009). Resource dependence or comparative advantage in natural resources is not equivalent to resource abundance (Wright and Czelusta, 2004). Most datasets face difficulty in accurately measuring mineral deposits and resource based data is unavailable for several different countries. Consequently, most of the literature uses ‘Natural Resource Dependence’, since it is easier to measure. Its use, however, leads to issues of endogeneity, for which not all studies successfully account.

Another issue lies with the measures used as proxies for either resource abundance or resource dependence. Sachs and Vial (2001) use the ratio ‘resource exports to total exports’ in their analysis of the resource curse hypothesis. They find the measure to have a negative impact on growth. As Brunnschweiler and Bulte (2007) condemn Sachs and Warner’s (1995, 1997, 2001) measure, likewise, Lederman and Maloney (2007) put forward the argument that Sachs and Vial’s (2001) finding that the ratio of natural resource exports to total exports negatively affects growth is identified because they fail to control for export diversification. Jean-Philippe (2003) conducts a review of the literature on mineral reserves by country, and finds no significant correlation between mineral reserves and GDP growth rates. Jean-Philippe (2003) explains that the Sachs-Warner export ratios are not even rough proxies for resource endowments and concludes that when more conceptually appropriate measures are used, the resource curse effect disappears.

Brunnschweiler and Bulte (2007) argue that Sachs and Warner's (1995, 1997, and 2001) finding of a negative effect of resources on growth relies on their proxy for resource abundance: the ratio of resource exports to GDP. Brunnschweiler and Bulte (2007) maintain that the ratio of resource exports to GDP is a measure of dependence or intensity instead of a measure of abundance. Similarly, Alexeev and Conrad (2009) apply the same line of criticism to studies that use oil dependency, measured by the share of oil output (or exports) in GDP as the independent variable of interest. Based on this intuition, Wright and Czelusta (2004), Brunnschweiler and Bulte (2007) and Alexeev and Conrad (2009) explain that using dependency measures introduces endogeneity bias in the regression results.

Neumayer (2004) points out a problem with econometric models regressing GDP growth on some measures of resource intensity. This paper explains that the GDP measure considers natural and other capital depreciation as income. The study removes depreciation from total GDP to identify what they refer to as 'genuine income'. Using this new measure, it still finds support for the resource curse hypothesis; however, the effect is slightly weaker. Brunnschweiler (2008) proposes two new measures for resources: 'subsoil wealth' and 'natural resource wealth per capita'. Only a few studies such as De Soysa (2002) use a per capita measure for resource wealth. In relation, the 'resource wealth per capita' measure suggested by Brunnschweiler (2008) and Basedu (2009) points out that this measure is indirectly measured by GDP per capita. This implies that the effect of resource wealth per capita and the effect of (non-resource) income per capita are confusing. Basedu (2009) also highlights that 'resource wealth per capita' definitely measures potential income rather than actual income.

Another issue related to 'per capita' based measures lies in the Malthusian theory. According to this theory, a positive effect of the standard of living on the growth rate of population might result in negative feedback from the size of population on the standard of living. Cotet and Tsui (2009) find a robust Malthusian effect because of oil abundance, which might reduce per capita GDP growth. Therefore a population explosion greater than increases in revenue may be the reason for the lower per capita incomes over time, which studies interpret as a resource curse. Cotet (2009) also criticises the use of the 'resources per capita' measure as an independent variable in cross country analysis, explaining that, most of the time, various countries discover oil at different points. The study emphasises that comparing cross-sectional oil reserves at a specific point in time may understate the magnitude of oil abundance for countries that discover and commence the production oil earlier. In addition, Cotet (2009) points out that population is endogenous to oil abundance; therefore, if oil has a positive impact on population growth, normalising oil by the current population can result in an upward bias in estimating the effect of oil on economic growth. Leamer (1984) claims that an appropriate measure of resource abundance based on the Heckscher-Ohlin theory is 'net exports of resources per worker' in the economy. Lederman and Maloney (2007) use a similar measure, 'net exports of natural resource-

intensive commodities per worker', and do not find resource abundance to exhibit a negative impact on growth.

Some of the varying conclusions reached by studies on the affiliation between resource abundance and growth are also attributed to modelling and estimating differences. The main debate revolves around the use of panel estimation versus cross sectional data and time series analysis, the use of instrumental variables, endogeneity issues, omitted variable bias, and time period and data availability.

From a theoretical standpoint, the neoclassical growth model (Barro, 1998) provides the basis for the cross-country growth regression framework. Most cross-section studies provide evidence in support of the resource curse hypothesis. On the other hand, Deaton and Miller (1995) and Collier (2009) show that time series analyses utilising vector autoregressive models have failed to find such support.

Despite all the cross-sectional growth regressions in support of the resource curse, there are still critics of this methodology. Islam (1995) states compellingly that cross-country regressions suffer from omitted variable bias and they fail to make provision for correlation between the initial level of productivity and past income per capita. Parente and Prescott (1994) and Van der Ploeg (2007) highlight the fact that cross-sectional estimations do not reflect the dynamics of the resource curse and potentially suffer from omitted variable bias. It is therefore vital to move from cross-country to panel data evidence (Parente and Prescott, 1994; Islam, 1995, Van der Ploeg, 2007). Manzano and Rigobon (2001) present evidence that the curse is not evident in panel estimates; however, it is worth noting that it is not only panel studies that fail to find support for the curse.

Arezki and Van der Ploeg (2007) re-examine the cross-country evidence based on Sachs and Warner (1995), correcting for the endogenous nature of the explanatory variables by using instrumental variables. The findings of those cross-country studies are invalidated by Arezki and Van der Ploeg (2007). A large fraction of the resource curse empirical literature does not use instruments for investment, institutions and trade and consequently produces biased and misleading estimates. Care must however be taken when considering which variables can be instrumented. For example, the ratio of resources to GDP (dependence) is potentially endogenous and, if instrumented, it does not significantly affect growth; on the other hand, resource wealth (abundance) has a significant positive impact on growth (Brunnschweiler and Bulte, 2008).

Due to the data available, most studies do not cover an excessively long period of time and data that is definitely accurate is not available for precise future revenue from resource endowments. "Growth processes take place across the very long run and probably cannot be convincingly summarized by cross section regressions of one highly turbulent 20-year period at the end of the 20th century" (Maloney, 2001). Reflecting on this conundrum from empirical studies, Stevens (2003) argues that a case-by-case

approach rather than some sort of generalisation is the way forward in investigating the resource curse hypothesis.

2.3 REVIEW OF THEORETICAL DEBT OVERHANG-GROWTH LITERATURE

Growth Models

The Harrod-Domar model (1946) is one of the pioneering models for the analysis of growth and shows that economic growth is based directly on capital accumulation. According to the model, if debt can raise capital accumulation, it will lead to growth. The Neoclassical Growth model by Solow-Swan (1956) assumes that technological change and saving are exogenous and the technology process is labour-augmenting, proposing that differences in capital per worker and in the effectiveness of labour account for the variation in output per worker. In contrast to the growth path suggested by the Harrod-Domar model (1946), the Solow model indicates that physical capital accumulation cannot account for growth over time or the geographic differences in output per person.

Chenery and Strout (1966), based on the Harrod-Domar growth model, develop the Two-gap model. According to this model, the act of filling two gaps is responsible for economic growth. The internal gap is between investment and saving and the external gap is between imports and exports. Chenery and Strout (1966) explain that the internal gap highlights the necessity for developing countries to supplement resources to accumulate capital and that the external gap assumes that imports are necessary for the production of investment goods. Consequently, based on the Two-gap model, it can be inferred that economic growth is inhibited by an inflow of foreign capital. Oyejide (1985) provides further support for this model by claiming that, with swift economic growth, the rate of investment might necessarily be greater than that of public savings. Therefore the need might arise for the government to make use of borrowing to complement public savings. Cohen and Sachs' (1986) model shows two phases of economic growth, assuming an endogenous growth ceiling and a possibility of debt repudiation. According to this model, in the first phase the growth rate of external resource inflow would be greater than the growth rate of output. In the second phase, the inflow of resources and growth will both slow down. Cohen and Sachs' (1986) model goes on to show that, in line with this slowing down of growth and in order to ensure that the country does not default, permanent refinancing (linked to output) of debt service will be the only equilibrium strategy.

Such models are criticised because of their impractical assumptions such as a constant capital-output ratio and an unlimited supply of foreign credit, resulting in their empirical implications being

counterfactual (Eaton, 1993; Barro and Sala-i-Martin, 1995). A better practical assumption is that, owing to moral hazard or the risk of debt repudiation, countries may not be able to borrow freely (Gertler and Rogoff, 1990). Such models, for example, that proposed by Cohen (1991), argue that in reality it is possible that countries may not be capable of borrowing freely because of moral hazard or the risk of debt repudiation, nor are they in financial autarky. In these models, low levels of debt are still linked with higher growth than in financial autarky.

Assuming no non-Keynesian effects, the traditional view is that in the short term debt can kindle aggregate demand and output, but in the long term it crowds out capital and reduces output (Elmendorf and Mankiw, 1999). “In the absence of foreign borrowing, growth will proceed at the highest rate permitted by the most limiting factor. If the biggest gap is the savings-investment gap, growth is limited by the availability of domestic savings ... if the biggest gap is the foreign exchange gap, growth is limited by the availability of foreign exchange ... traditionally, the role of foreign borrowing was to supplement domestic saving” (Thirlwall, 1978, p. 293).

This argument lays the basic foundation for the need for borrowing (debt). In Modigliani’s (1961) aggregate model, debt accumulation can positively affect growth if the increase in debt is complemented by government expenditure on productive public capital. The problem, however, is eventual ‘debt overhang’. Krugman (1988) defines debt overhang as a state in which the expected repayment on external debt falls short of the contractual value of the debt. “The debt overhang arises in a situation in which the debtor country benefits very little from the return to any additional investment because of debt service obligations. When foreign obligations cannot be fully met from existing resources and actual debt payments are determined by some negotiation process between the debtor country and its creditors, the amount of payments can become linked to the economic performance of the debtor country, with the consequence that at least part of the return to any increase in production would in fact be devoted to debt servicing. This creates a disincentive to investment from the point of view of the global interest of the debtor country” (Borensztein, 1990).

Accordingly, the theoretical literature on the connection between growth and the stock of external debt focuses mainly on the adverse effects of ‘debt overhang’. In neoclassical growth models, perfect capital mobility leads to economic growth. In endogenous growth models, the mounting cost of foreign capital inflow cuts external borrowing, initiating a fall in long term economic growth (Andersen, 1995). In its original formulation, the debt overhang theory centres on the antagonistic influences of external debt on investment in physical capital. The bounds of the theory have evolved to include the effect of debt on a government’s incentives to execute structural, fiscal and domestic debt reforms (Corden, 1989).

Transmission Mechanisms (taxes, private savings, public investment, total factor productivity (TFP) and domestic long-term nominal and real interest rates, uncertainty)

Iqbal and Kanbur (1997) and Clements, Bhattacharya and Nguyen (2003) clearly explain how debt overhang is likely to negatively affect growth. According to them, when a country's debt level is expected to surpass the country's future repayment ability, expected debt service is prone to be an increasing function of the country's output. Therefore, a fraction of the gains from domestic investment are in effect 'taxed away' by existing foreign creditors. This 'taxing away' will eventually discourage investment by domestic investors, foreign investors and economic growth. As highlighted by researchers such as Oks and Wijnbergen (1995), Agénor and Montiel (1996) and Maier (2005), a situation where the level of debt is greater than the repayment capability of the debtor results in a distortionary tax. This form of marginal taxation, a tax on returns, discourages future domestic and foreign investment. Taxation is not the only mechanism through which debt negatively affects growth. The theoretical literature highlights major channels through which government debt can affect the economic growth rate: private savings, public investment; total factor productivity (TFP) and domestic long-term nominal and real interest rates.

Increased uncertainty brought about by debt overhang also lowers investment and growth. As the value of the national debt increases, uncertainty about the steps and policies governments will adopt in order to meet their debt servicing increases (Agénor and Montiel, 1996; Pattillo, Poison and Ricci 2002). The uncertainty about debt repudiation and moral hazard may impede the state's prospect of borrowing capital on international capital markets without constraints. Consequently, the loss of access to world financial markets may result in reduced investment and economic growth (Borensztein, 1990; Cohen, 1993). High debt service payments can 'crowd out' the aggregate resources available for public spending on infrastructure, human capital and investment (Alejandro, 1981; Taylor, 1983; Serieux and Samy, 2001; Clements, Bhattacharya and Nguyen, 2003). Speedy amassing of debt can also be accompanied by an increase in capital flight if the private sector suspects forthcoming default (Clements, 2003). Most countries therefore seek to ensure a sustainable level of debt, which is sustainable if the growth rate of output is equal to or greater than the rate of interest and accumulated debt (Nikbakht, 1984; Czerkawski, 1991). Those whose debt has reached unsustainable levels pursue conditionalities imposed by lenders to qualify for debt relief. If partial debt is relieved, the debt becomes a lump-sum burden and investment is encouraged (Sachs, 1989; Krugman, 1988; Basu, 1997).

It is erroneous to think that debt has an entirely negative impact on growth in every case. There are suggestions in the theoretical literature that foreign borrowing has a positive effect on investment and growth up to a certain threshold, beyond which its impact is adverse (Clements et al., 2003). The optimal level of debt is when the marginal benefit equals the marginal cost of the external capital (Eaton, 1989;

Hjertholm, 2000). Researchers including Cohen (1993) and Agénor (2000) illustrate this relationship as a kind of ‘Debt Laffer curve’.

2.4 REVIEW OF EMPIRICAL DEBT OVERHANG –GROWTH LITERATURE

Empirical studies have investigated the effects of “debt overhang”. This research on debt overhang mostly focuses on proving that, in the presence of a large stock of debt, returns from investment are sub-optimal (Dooley, 1989; Froot, 1989; Borensztein, 1990). One group of these papers tests the potential crowding-out effect of debt on investment (Warner, 1992; Serven and Solimano, 1993; Elbadawi et al., 1997). Another set examines the effect of debt on growth in cross-country regressions, focusing on the existence of nonlinear relationships between debt and other economic variables, especially investment and growth (Arran, 1990; Borensztein, 1990; Villanueva, 1991; Cohen, 1993). This thesis now reviews studies that empirically investigate the debt overhang phenomenon, some of which are considered to be country specific cases, whilst others examine samples of countries. Djikstra and Hermes (2001) review several studies on the debt overhang hypothesis and infer that the empirical evidence is inconclusive.

Debt and Investment

Borensztein (1990) finds an adverse effect of debt overhang on private investment in the Philippines. Iyoha (1997, 1999) maintains that debt can diminish investment and lower the rate of economic growth, utilising data from Nigeria. Focusing on data for Cameroon, Mbanga and Sikod (2001) display evidence of debt overhang on private investment and crowding-out effects on public investment. Ezeabasili, Isu and Mojekwu (2011) conduct a similar study for Nigeria between 1975 and 2006. Their results reveal a negative link between external debt and economic growth, and a unidirectional causality between external debt service payment and economic growth. Javed and Sahino (2005) carry out an empirical analysis of the influence of external debt on the Turkish economy. Their results suggest that, in the case of Turkey, a large increase in the stock of external debt affects investment negatively and exports positively, but has no effect on growth.

Debt and Growth

Balassone, Francese and Pace (2011), concentrating on Italy, examine the connection between the government debt-to-GDP ratio and real per capita income growth over 1861 to 2009. Balassone et al. (2011) explain that there is a negative correlation between debt and per capita GDP growth between 1890 and 1914 and that the correlation between the two variables breaks down between 1985 and 2007. Conversely, Wejeweera et al. (2005) reveal that in Sri Lanka during 1952- 2002, the country did not

have a problem of debt overhang and that indebtedness was not the major obstacle to its growth. For the case of Ethiopia, Desta (2005) reaches a similar conclusion. Sen et al. (2007) verifies the 'debt overhang' hypothesis using data from Argentina, Brazil, Columbia, China, India, Indonesia, Korea, Mexico, the Philippines, Thailand and Venezuela. Ayadi and Ayadi (2008) carry out a comparative analysis of the effect of the external debt service burden on economic growth and investment in Nigeria and South Africa. They discover that, in the case of South Africa, debt has a significant positive relationship with output growth, whilst for Nigeria debt service is found to exert a positive, but statistically insignificant effect on output.

Some researchers concentrate on the impact of debt on growth in specific country groupings. For example, regional groupings, by level of income, level of development and level of indebtedness. Goldman and Olin (1987) show that the debt overhang that exists in Third World countries is as a consequence of the unproductive utilisation of borrowed resources. Elbadawi et al. (1996) confirm the impact of debt overhang on economic growth in ninety-nine developing countries and conclude that it is the accumulation of debt which has a negative impact on growth. Fosu (1996, 1999) assesses the link between economic growth and external debt for a sample of Sub-Saharan African countries (SSA); the study reveals that there is a significant negative association between debt and economic growth and a weak negative impact of debt on investment levels. Ndung'u (1998) postulates that lagging growth and the investment gap in Africa is as a result of the external debt problem. Greene and Villanueva (1991) also find an indication of the debt overhang effect, for a sample of developing countries that excludes heavily indebted poor countries (HIPC).

Afxentiou and Serletis (1996) divide their panel of countries into: developing countries, severely indebted middle income, moderately indebted low income, moderately indebted middle income, and severely indebted middle income and investigates the impact of debt on growth. The results show that between 1970 and 1980, external debt did not affect economic growth negatively, but the link turned negative between 1980 and 1990. Weeks (2000) estimates a cross-country growth regression using data for eighteen Latin American countries. The study reports that external indebtedness has a large and negative impact on GDP growth. Hepp (2005), for a cross-section of 122 developing countries, also finds a negative debt –growth relationship. Scott (1995) obtains similarly negative results for Sub-Saharan Africa. Adam (2004) theorises that large debt accumulations in many LDCs result in debt overhang, which dampens investment and negatively influences future output. Abbas and Christiansen (2007) explore the effect of domestic debt on low-income and emerging market countries. They find that moderate levels of domestic debt, as a fraction of GDP and bank deposits, positively affects growth, but when the domestic debt-GDP ratio is greater than a threshold level of 35% of bank deposits, domestic debt began to weaken growth.

Reinhart and Rogoff (2009) provide proof of a negative link between public debt and growth. They scrutinise economic growth at different levels of government debt in a sample of forty-four countries and discover that, when the debt-to-GDP ratio is above 90%, median growth rates fall by 1%. Kumar and Woo (2010), after controlling for other determinants of growth, highlight the linear negative effects of initial debt levels for growth in advanced and emerging economies. Investigating the economic consequences of high burdens of external debt in poor countries, Presbitero (2006) also finds a linear and significantly negative link between external debt and growth in low income countries and highly indebted poor countries (HIPCs).

Focusing on HIPCs, Cunningham (1993) estimates the impact of debt and economic growth in sixteen HIPCs between 1971 and 1987. The results reveal that the negative relationship between a country's growth and debt burden confirms the existence of debt overhang in HIPCs. Sawada (1994) reaches a similar conclusion using annual time series data for heavily indebted countries for the period 1955 to 1990. Deshpande (1997) explores the debt overhang hypothesis by empirically investigating the investment experience of 13 heavily indebted countries, finding a consistently negative relationship between external debt and investment. Using panel data for HIPC and non-HIPC countries, Chowdhury (2001) highlights a statistically significant impact of different debt indicators in both groups of countries. Presbitero (2005) shows a negative linear relationship between external debt and economic growth, and between debt service and investment, especially in low income countries. Studies by Eichengreen and Portes (1986), Cunningham (1993), Metwally and Tamaschke (1994) and Elbadawi et al. (1996) also note that excessive indebtedness has a significantly negative effect on economic growth.

The relationship between debt and growth is not always linear, thus the theory of the Debt Laffer Curve. In the empirical studies that investigate the Debt Laffer Curve hypothesis, the level of indebtedness is crucial. Claessens (1990) and Claessens et al. (1991) find that extremely indebted countries are on the 'wrong' side of the Laffer curve, signifying that a partial lessening of debt would increase the expected repayment to the creditors. In both papers, however, the position of middle-income countries on the Debt Laffer Curve depends on the exact specification of the model, raising concerns regarding how robust such findings really are. Elbadawi et al. (1997) directly assesses the nonlinear impact of debt on economic growth for a sample of ninety-nine developing countries using panel techniques. Their results imply that at minimal levels, debt stimulates growth, but past a certain threshold accumulated debt has a negative impact on growth. Similarly, Cohen (1997) investigates the nonlinear debt- growth relationship. Cohen (1997) utilises a variable that predicts the risk of a debt rescheduling (or debt crisis). The result reveals that when the debt to GDP ratio reaches 50% and debt to exports ratio reaches 200%, the probability of rescheduling debt or experiencing a debt crisis becomes excessive, significantly lowering growth. Pattillo et al. (2001, 2002, 2003, and 2004) empirically study the connection between

total external debt and GDP growth for developing countries. They test the debt-growth relationship for a sample of about 100 developing countries using various nonlinear specifications and both net present value debt and nominal debt. They prove that debt has an inverted U-curve relationship with growth and confirm the debt overhang hypothesis.

Comparable results are found by Clements, Bhattacharya, and Nguyen (2003). Clements et al. (2003) investigate the impact of external debt on growth and on the transmission mechanisms of debt in fifty-five low-income countries between 1970 and 1999. However, they find that higher debt service has a non-linear significant 'crowding out' effect on public investment and thus growth. Clements et al. (2004) show foreign debt has adverse effects on economic growth and public investment via debt service. They also confirm the non-linear relationship between debt and growth.

Cordella et al. (2005) examine how the debt-growth relationship varies with indebtedness levels in a panel of 80 developing countries, divided into HIPCs and non-HIPCS. Even though they find a highly non-linear relationship between debt and growth, in contrast to Pattillo et al. (2002,2003,2004), the results from Cordella et al.(2005) suggest that there is a negative marginal relationship between debt and growth at intermediate levels of debt, but not below the debt overhang threshold, or above the debt irrelevance threshold. They also find that economies with good policies and institutions face debt overhang when debt increases above 15-30 % of GDP, but the marginal impact of debt on growth becomes irrelevant above 70-80%. The study also reveals that the overhang and irrelevance thresholds are lower in countries with bad policies and weak institutions.

Checherita and Rother (2010), for a sample of twelve countries in the Eurozone between 1970 and 2008, reveal a non-linear impact of debt on per capita real GDP growth. Imbs and Ranciere (2005) discover some indication of debt overhang occurring when the net present value of debt to GDP reaches 30-35 %. Caner et al. (2010), for a large sample of countries, establish that the threshold effect kicks-off at growth rates of 77% of GDP, with a lower threshold for emerging markets. Cecchetti et al. (2011) identify a similar threshold effect; this shows that varying thresholds in the relationship between public debt and growth have been identified by empirical studies. Other previous empirical studies that confirm the nonlinear effects of debt on growth include Smyth and Hsing (1995), Cohen (1997), Elbadawi et al. (1997), Reinhart and Rogoff (2010) and Kumar and Woo (2010) .

Using the system GMM dynamic panel econometric technique proposed by Arellano and Bover (1995) and Blundell and Bond (1998), contrary to previously reviewed studies, Schclarek (2004) does not find any evidence of an inverted-U shape relationship between external debt and growth. The study also points out that it is public external debt and not private external debt that drives the negative link between debt and economic growth for a sample of 59 developing and 24 industrial countries between

1970 and 2002. Along similar lines as Schclarek (2004), Maier (2005) explores a linear and non-linear impact of external debt on growth in developing and transitional countries for the period 1970 – 1999 using an irregular and unbalanced panel of time-series cross-country data. Maier (2005) detects only weak evidence for a reverse Laffer curve effect of external debt to GDP ratio with respect to the growth rate and a significant Laffer curve disappears with respect to the total effect. Abiad and Ostry (2005) also conclude that in developing countries, excessive public debt does not stimulate an increase in primary surpluses.

Once countries have accumulated a certain level of debt, policies pursuing debt relief often follow, particularly in the case of heavily indebted countries. As always, there is no consensus on the empirical evidence on the impact of debt relief on growth. Borenstein (1990), using numerical simulations for a representative debtor country, discovers that debt relief does not have any significant quantitative effect on growth.

Presbitero (2009) evaluates the impact of debt-relief programmes on different macroeconomic indicators in developing countries, focusing on HIPC. The results indicate a weak link between debt relief and economic performance. They also reveal that it is correlated with growing domestic debt, which undercuts encouraging achievements in reducing external debt service. Often accompanying, or in some cases following, debt relief is aid. Cahill and Paul (2000) construct a model in which debt and aid are complementary. Despite the fact that the model overestimates the actual amount of aid and debt, they reveal a bi-directional relationship between aid, GDP and absorption. Cordella et al. (2002, 2005) provide a framework to explain why aid flows can be pro-cyclic, and the intuition behind the fact that donors who are also debt-holders keep giving aid without granting debt relief. Their results indicate that as long as the priorities of the governments of indebted countries match those of lenders/donors, they will keep receiving aid. Hepp (2005) explains that because donors have increased aid to heavily indebted countries, the crowding out of public investments is avoided, reducing the negative impact of the level of debt on growth. Hansen (2004) analyses the argument that debt overhang should be a negligible issue in HIPC because they have larger aid inflows than debt service outflows. The study shows that aid and debt work through their impact on both investment and growth. If official aid is constant and debt service payments are reduced by one percentage point of GDP, growth increased approximately by 15 basis points. He cautions that this small effect disappears if aid decreases by the same proportion.

Negative or positive correlations between debt stocks and economic growth alone are inadequate to explicitly analyse the debt-growth relationship. Some studies therefore consider the issue of causality between debt and certain transmission channels through which it affects economic growth. Chowdhury (2004) contends that there is a strong causal link from external debt to growth. Afrentiou (1993)

employs the Granger causality test to examine the connection between GNP growth and foreign debt in twenty middle-income developing countries from 1971 to 1988. The Granger causality test shows that there is no causal relationship between debt and income. Afxentiou (1993) concludes that indebtedness alone cannot affect per capita income growth. The results of Amoateng and Amoako (1996) indicate positive causality between the GDP growth rate and foreign debt service for a sample of thirty-five African countries. The study also analyses the interrelationship between exports, GNP growth and foreign debt servicing during 1971-1990 for the 35 countries. The empirical results confirm that after excluding exports revenue growth in SSA countries, a positive unidirectional causal relationship exists between foreign debt service and GDP growth during 1983-1990. Karagöl (2002) extends the model of Cunningham (1992) to investigate the long term and short term relationship between growth and external debt service for Turkey during 1956-1996. Similar to Amoateng and Amoako (1996), the Granger causality test results show a uni-direction causality running from debt service to economic growth.

Boyce (1992) and Ajayi (1997) hypothesise the existence of dual causality between capital flight and external debt in Sub-Saharan Africa. Reinhart and Rogoff (2009) also find bi-directional causality underlying the correlation between debt and growth. Fofack (2009) continues this bidirectional discovery by using co-integration and error-correction models to show that dual causality between external debt and capital flight cannot be rejected for some countries. He shows that the reverse causality from capital flight to external debt is equally strong in a number of countries. In Kumar and Woo's (2010) study of advanced and emerging economies over 1970-2007, they reveal an inverse relationship between initial debt and successive growth.

Sichula (2012) estimated a modified linear debt overhang model to show the effect of debt relief on both economic growth and private capital in the Heavily Indebted Poor Countries (HIPC) of the Southern African Development Community (SADC). In addition, the study also carried out a causality test to determine the causal relationships shared by economic output, private capital and debt service obligations. Sichula (2012) revealed a significant inverse relationship between external debt and GDP. Debt service does not have any direct effect on GDP or private capital unless via forms of macroeconomic variables like debt. In addition, the research showed that as countries in the region attained HIPC completion, GDP greatly increased and it is assumed that this was due to a decrease in debt service obligations.

Kasidi and Said (2013) investigated the impact of external debt on economic growth of Tanzania from 1990 to 2010 using time series data on economic performance and external debt and. Their study revealed that there is significant impact of the external debt and debt service on GDP growth. The co-

integration test however showed that there is no long run relationship of the external debt and GDP for Tanzania during the period under review.

Debt and Transmission Channels

-Debt Servicing:

Some debt-growth studies carefully evaluate the transmission path through which debt impacts on medium and long term growth. Cohen (1993) estimates investment equations for a sample of eighty-one developing countries between 1965 and 1987 and finds that debt levels fail to account for the negative influence on growth for Latin American countries. The study concludes that the crowding out effect of debt servicing costs is the main transmission channel.

A popular explanation for the slow growth and economic problems of SSA countries is their large debt service payments (Adam, 2004). Green and Villaneva (1991) observe that debt service has a significantly negative effect on private investment and thus growth in developing countries. Elbadawi, Ndulu, and Ndung'u (1997) reach a similar deduction in their study of growth in Sub-Saharan Africa. In Chawdhury's (2001) study on HIPC's, debt servicing as a percentage of either export earnings or GDP on the growth rate of GDP per capita is found to have a statistically significant adverse effect on growth. A study conducted by the World Bank (1989) maintains that the large debt service payments made by indebted Least Developed Countries (LDCs) hinder their growth.

On the contrary, Savvides, Kumar and McLambo (1996) discover that debt service has an insignificantly negative impact on growth. Deshpande (1997) also reaches a similar result from a study of thirteen severely indebted countries. Fosu (1999) and Pattillo et al. (2002) also do not observe any statistically significant relationship between debt service and growth.

-Total Factor Productivity:

Fosu (1996, 1999), Pattillo, Poirson, and Ricci (2003) discover that the debt overhang operates mainly through total factor productivity (TFP) and investment. In other words, even if investment levels remain unaffected, external debt may still affect output growth. Deshpande (1997) scrutinises the association between external debt and investment for thirteen severely indebted countries over the period 1971 to 1991. The study shows a negative relationship between external debt and investment. Schclarek (2004) also finds that capital accumulation growth is a significant channel through which external debt affects growth, but in contrast with Fosu (1996, 1999) and Pattillo et al. (2003), TFP growth is found not to have any significant link with external debt for several developing countries and industrial countries.

-Interest rates and taxes:

There is a large body of literature on the possible adverse effects of high government debt on economic growth via higher long term interest rates, and expectations of higher future distortionary taxation (Elmendorf and Mankiw, 1999). High levels of public debt can have undesirable effects on capital accumulation and growth through higher long-term interest rates (Gale and Orzag, 2003; Baldacci and Kumar, 2010). High debt may also, increase macroeconomic uncertainty and discourage investment (Servén, 1997). It may reduce the scope for counter-cyclical fiscal policy, resulting in higher output volatility and lower growth (Aghion and Kharroubi, 2007; Woo, 2009). Barro (1979) and Dotsey (1994) highlight the uncertainty about higher future distortionary taxation. The role of uncertainty about prospects and policies, which may result in greater volatility and lower growth, is pointed out by researchers like Burnside et al. (2001) and Hemming et al. (2003), Aghion Kharroubi (2007) and Woo (2009). Sargent and Wallace (1981), Barro (1995) and Cochrane (2010) focus on the role of inflation in influencing the impact of debt on growth. Other channels discussed in the literature include levels of financial development, long term interest rates and volatility.

Financial Markets and Uncertainty

A number of recent studies on endogenous growth point out that countries with better developed financial intermediaries and markets benefit from higher growth rates (Amable and Chatelain, 2001; Benhabib and Spiegel, 2000). Earlier studies, including Goldsmith (1969), McKinnon (1973) and Shaw (1973), show that financial sector development results in increased savings and capital accumulation, and hence economic growth. Jen-Te, Chien-Ping and Chieh-Hsuan (2010) use the panel data of twenty high external debt countries from Asia and Latin-America to investigate the financial sector development-debt-growth connection. Jen-Te et al. (2010) ascertain that excessive debt subdues an economy's financial sector development, eventually deterring economic growth. As in Patrick (1966) and a number of endogenous growth models, Jen-Te et al. (2010) also finds a two-way causal link between financial sector development and economic growth. Along similar lines, Caballero and Krishnamurthy (2003) show that an undeveloped financial sector moderates the incentives for foreign lenders to lend to countries exhibiting such characteristics. Consequently, this leads to moral hazard, increases in the cost of external capital and reduced growth. To reduce the effect of moral hazard, creditors apply conditionalities to financing. In some cases, the conditionalities of some lenders such as the IMF and World Bank have been argued to have growth limiting effects.

Governments of countries with excessive debt struggle to effectively implement economic policies. Lenders and investors are often generally uncertain about the outcome of such policies. This kind of uncertainty generates instability in the indebted economy, thus discouraging domestic investment

(Claessens, Oks and Van Wijnbergen, 1993). Aizenman and Marion (1999) show that increased uncertainty also affects the supply of international credit offered to indebted countries.

Quality of Institutions

Governments do not carry all the responsibility for the implementation of policies; the quality of institutions matter as well. The significance of institutional factors as determinants of the effect of debt on economic growth in low and middle-income countries is widely recognised (Acemoglu, Johnson and Robinson, 2005; Imbs and Ranciere, 2005; Colombo and Longoni, 2007; Harrabi et al., 2007 and Presbitero, 2010). Arslanalp and Henry (2006) argue that weak economic institutions and infrastructure, and not excessive debt burdens, are the key deterrents to investment in HIPCs. Presbitero (2008) stresses that external debt overhang seems to be relevant in countries with sound institutions, whilst it seems to be to be irrelevant for countries with weak institutions. Kutivadze (2011) scrutinises the impact of government debt on growth by controlling for the quality of institutions in countries of varying income levels between 1990 and 2007. Whilst confirming a non-linear relationship between total public debt and growth in middle and low-income countries for high income countries, the study fails to find any backing for a robust relationship between public debt and growth. Debt structure was found to be relevant for growth in middle-income countries.

Domestic Savings

Based on growth models, domestic savings are vital for growth. The savings constraint indicates the incapacity to save a sufficient amount of resources to promote investment and self-sustained growth. Debt servicing can to some extent reduce the capability for accumulating domestic savings, eventually putting a strain on economic growth. Root (1990) explains that the vicious cycle of the saving – investment gap is the key hindrance to growth and development in developing countries. Based on the Two-Gap model, Tiruneh (2004) arguing from the viewpoint of debtors, stresses that the economic debate of foreign borrowing is linked to the growing gap between domestic savings and domestic investment. Okafor and Tyrowicz (2008) provide a theoretical framework to test the interconnection between foreign debt and domestic savings for a sample of developing countries selected from Sub-Saharan Africa, Latin America and the Caribbean between 1975 and 2004. With the use of instrumental variables, they find a negative long term impact of foreign debt on domestic savings when accumulated debt has passed a country-specific threshold. Griffin and Enos (1970) and Rahman (1976) also confirm a significant negative relationship between savings and debt. Another side effect of debt servicing is capital flight. A few studies such as Ndikumana and Boyce (2003) reveal that for every foreign dollar borrowed in Sub-Saharan Africa; approximately 80 cents flow out in the form of capital flight in the same year. Assuming this money had stayed in the indebted countries, debt burdens would have been reduced considerably.

The validity of the debt overhang hypothesis has been questioned by writers. Cohen (1993) tests the hypothesis for a sample of eighty-one developing countries over the period 1965 to 1987. Cohen (1993) rejects the debt overhang hypothesis, but finds evidence in support of the crowding out effect of debt service on investment. Iyoha (1996) concludes that through both debt overhang and the crowding out effect, large debt burdens reduce investment in Sub-Saharan African countries. Elbadawi et al. (1996) also corroborate a debt overhang effect on economic growth for a sample of ninety-nine developing countries chosen from SSA, Latin America, Asia and the Middle East. Similarly, Fosu (1999) identifies evidence of the debt overhang hypothesis in an empirical study of thirty-five sub-Saharan African countries. Greene and Villanueva (1991), Serven and Solimano (1993), Ndulu, and Ndung'u (1997) and Chowdhury (2001) all find evidence in support of the debt overhang hypothesis. On the other hand, Savvides (1992) finds that the ratio of debt to GNP has no statistically significant impact on growth. Warner (1992) concludes that the debt crisis fails to reduce investment. In a similar vein, Hansen (2001) fails to find any statistically significant effect of external debt on growth in a sample of fifty-four developing countries, which includes fourteen HIPC.

2.5 REVIEW OF THE DEBT OVERHANG-RESOURCE CURSE GROWTH LITERATURE

Debt Overhang Theory

The main theme of this research which is to investigate the debt overhang –resource curse hypothesis has its roots in a branch of the volatility theory, namely, the debt overhang theory. This theory was selected because debt issues are relevant to the current economic climate especially the post-first world debt crisis of 2007 and the slow recovery of affected economies. It mainly links the external stock of debt to the adverse effects of ‘debt overhang’ in resource rich- countries. Prebisch (1950) and Singer (1950) propose the ‘Prebisch’ hypothesis, one of the earliest roots of the eventual debt overhang explanations for the ‘resource curse’. They argue that resource-based growth would be negatively affected by a decline in the world prices of natural resources.

To the best knowledge of this researcher, the most widely cited study that put forth a similar theory linking debt overhang to resources is by Manzano and Rigobon (2001). They theorise that with the existence of credit constraints, resource -rich countries use resources as collateral. In consequence, volatility of resource prices, especially price decreases, affects the ability of these countries to repay their debts. Those that could not implement policies to address the boom-bust cycle of commodity

prices suffered the consequences of the debt overhang in the eighties and nineties, thus limiting their capability for economic growth, hence the resource curse.

Manzano and Rigobon (2001) and Hausmann and Rigobon (2002) highlight the potential debt overhang effect that volatile commodity prices have on economic growth in resource-rich countries. These studies explain that abrupt changes in commodity or prices or resource discoveries can lead to income boom and bust cycles. In the 1970's, commodity prices were high and were used by resource-rich countries as collateral for debt. A decade later, commodity prices fell significantly. Manzano and Rigobon (2001), using panel data estimation, reveal that this volatility of commodity prices led many resource-rich countries into debt crises. Hausmann and Rigobon (2002) also show that volatile resource revenues have adverse effects on household incomes. However, welfare losses are shown to be miniscule compared with losses from imperfect financial markets. It is worth noting that when debt is included as an explanatory variable in the panel data estimation, the effect of resource dependence disappears (Manzano and Rigobon, 2001).

Manzano and Rigobon (2001) highlight some econometric issues with the Sachs and Warner (1997) study that result in the conclusion that there is a negative link between resource abundance and growth. They comment that the results of Sachs and Warner (1997) might depend on factors that are correlated with primary exports, but have been excluded from the regression. Secondly, total GDP includes the production in the resource sector that had been declining. In their estimation, Manzano and Rigobon (2001) corrected for those issues and their results indicate that the so-called natural resource curse might be related to debt overhang. They explain that where countries with a large amount of resources use their resources as collateral for debt, huge decreases in commodity prices result in high debts for these countries. When they estimate a model that takes this fact into account, Manzano and Rigobon (2001) show that the effect of resource abundance disappears, leading to the conclusion that a debt overhang problem that slows growth is the reason behind the underperformance of resource-rich countries, not resource abundance.

Hausmann and Rigobon (2002) suggest that the resource curse results from imperfections in the financial market. They propose an alternate rationale for the curse based on the interaction between the specialisation of the domestic economy in the production of non-tradable goods and financial market imperfections. They show that, as the volatility of profits in the non-resource tradable sector increases, so do sector-specific interest rates. This leads to a drop in the output that is larger for the non-resource tradable sector. Due to financial market imperfections, a multiplier effect is set in motion, where the increases in interest rates lead the tradable sector to also contract, resulting in further increases in volatility and interest rates until the sector disappears.

Similar to Haussmann and Rigobon (2002), Bulte, Meissner and Swansonii (2010) focus on international credit market imperfections and institutional failures within resource-rich economies. In particular, Bulte et al. (2010) examine the mechanism through which extreme resource-based lending by external financial institutions can stimulate debt and regime change in autocratic developing countries. Bulte et al. (2010) model the impact of credit market imperfections on the inter-temporal choices of dictators in resource-rich countries. They point out that the indebtedness and poor performance of economies with abundant resources is a result of poor contracting by the financial sector. According to the study, a dictator's choice of staying and looting depends on the level of lending offered by external banking institutions.

There is no clear cut conclusion of the impact of debt on growth. It is not always that only economic growth that matters. The impact of debt on development and poverty is still central for policymakers. The theoretical and empirical literature implicitly presents the assumption that overall growth leads to poverty reduction; therefore, the direct impact of external debt on poverty is rarely explicitly modelled and tested. Schinke (1994) investigates the impact of indebtedness on poverty through the change of relative prices of traded goods. The results indicate that debt has different effects on poverty, depending on wage rigidities in the labour markets of the trade and non-trade sector. More recently, Agénor, Fofack and Izquierdo (2003) and Loko, Mlachila, Nallari and Kalonji (2003) find that the debt indicators have a limited, but not negligible effect on non-income poverty indicators.

Unfortunately, most of these studies are burdened with technical shortcomings and may not have captured all direct and indirect effects of the external debt problem on economic growth as a result of limited data availability. Due to a choice of estimation technique, some of these studies may have produced biased estimates or failed to capture country differences and economic shocks. For example, Rockerbie (1994) may not have captured the heterogeneities of different countries and major economic shocks in the world because he applied the OLS method in his study. This method is generally believed to yield biased estimates in cross country regressions. Iqbal and Khan (1998) advise that these results, however, should be viewed with caution, because the studies do not correct their overhang variable for the degree of concessionality of the loans, implying that the measure of indebtedness used does not accurately reflect differences in the burden of future debt service across countries. Despite the fact that these studies provide some evidence for and against debt overhang, Moss and Chiang (2003) and Depetris Chauvin and Kraay (2005) argue that these inconclusive results are due to a lack of robustness of econometric results. In addition, according to studies like Begg and Berlin (1988) and Moore and Thomas (2008), one must be aware of publication bias. They explain that publication bias might explain the diverse studies that arise when academic journals publish papers whose findings are 'statistically significant'.

This review of both the resource curse and debt overhang literature reveals the lack of studies that consider how resource rents and debt servicing simultaneously impact on growth. This is one of the gaps in the existing literature that this thesis wishes to fill.

CHAPTER THREE

DEBT OVERHANG, NATURAL RESOURCES AND GROWTH: A PANEL DATA ANALYSIS

3.1 THEORETICAL FRAMEWORK AND THE MODEL

In this section, the theoretical framework upon which this thesis' empirical analysis is based is being described. This provides the foundation for the models developed and estimated.

In growth regressions, most of the time, an ad hoc approach is used in estimations; output growth is regressed on a number of variables that are arbitrarily chosen. In other scenarios, a theoretical model is developed, but is not estimated; thus, the resulting econometric model is not connected to the theory.

In this piece of research, the main aim is the evaluation of the possible debt-overhang effect of resources in resource-rich countries, which has its theoretical underpinnings in both economic growth and debt theory. Most studies that investigate the empirics of economic growth rely on different versions of a growth model with a neoclassical production function of the Cobb-Douglas form. In most of these studies, the standard growth model is augmented with specific variables, key to answering the study's main research questions. Among the most used models is that of Robert Solow (1956) and Chenery and Stout (1966). For example, Arrow (1962) augmented the standard Solow growth model with variables to account for knowledge spill-overs; Lucas (1988), Mankiw, Romer, and Weil (1992), augmented it with variables to capture the effects of human capital accumulation.

Chenery and Stout (1966) Two-Gap model, provides the main theoretical inspiration for this thesis' investigation. In their Two-Gap Model, they explained that countries are faced with an internal gap between investment and savings and external gap between imports and exports. Countries need supplementary resources to fill these gaps and they often resort to borrowing.

In addition to the assumptions of Chenery and Stout (1966) Two-Gap model, this research also assumes that:

1. Resource rich countries use resource rents to fill both the internal and external gaps but they are inadequate.
2. Other capital inflows also help fill the gaps.
3. Receipt of resource rents and capital inflows; and the servicing of external debt happen simultaneously.

In a bid to investigate the debt-overhang- resource curse hypothesis whilst incorporating the above assumptions made about the economy, this research proposes to augment the Mankiw, Romer, and Weil (1992) specification of the Solow-Swan model with both resource rent and debt variables. Wijeweera, et al. (2005) and by Cunningham (1993) classified debt servicing as a primary factor of production.

Given that the economy receives resource rents and other forms of capital and services outstanding debt whilst it is growing, it is proposed that the impact of these three main activities be evaluated simultaneously in system. The system is made up of the main variables suggested by the Solow (1956) model and the Mankiw, Romer, and Weil (1992) version of the Solow-Swan Model which has been augmented with debt and resource variables. Hence, a system made up of three equations endogenous in growth, debt and capital inflow respectively is specified.

The following economic relationships to be evaluated within the system are specified:

$$Y_t = f(CI_t, L_t, S_t, DS_t, Z_t) \quad (1.0)$$

Where: y_t is output, CI_t is capital inflow DS_t is debt service, L_t is the total labour force, S_t , natural resource rent, and Z_t is a vector of carefully selected growth control variables .

The debt service relationship is specified as:

$$DS_t = f(Y_t, D_t, CI_t, S_t, ER_t, V_t) \quad (2.0)$$

Where: DS_t is debt service, D_t is the stock of debt, ER_t is the exchange rate and V_t a vector of debt sensitive control variables:

Along a similar path, the proposed capital inflow relationship:

$$CI_t = f(Y_t, DS_t, D_t, S_t, X_t) \quad (3.0)$$

Where: CI_t is capital inflow, and X_t is a vector of capital inflow control variables.

Eq. (1.0), (2.0) and (3.0), with the subscript ‘t’ referring to time in all cases, provide the basis for the system of simultaneous equations that will be estimated to determine whether the lower than expected long term growth of resource-rich economies is a result of debt overhang .

Utilising the information from the theoretical framework provided by Mankiw, Romer, and Weil (1992) specification of the Solow-Swan model and the Chenery and Stout (1966) Two-Gap model, following on from Equations (1.0), (2.0), (3.0), and adding an interactive term in the growth equation to directly capture the interaction between resource rent and debt servicing, hence the debt-overhang resource curse hypothesis , this research postulates that the following linear equations be estimated simultaneously within a system :

Output Equation:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 L_t + \alpha_3 DS_{t-1} + \alpha_4 CI_{t-1} + \alpha_5 S_t + \alpha_6 Z_t + \alpha_7 SDS_{t+} \varepsilon_1 \quad (1.1)$$

Debt Equation:

$$DS_t = \beta_0 + \beta_1 Y_t + \beta_2 D_{t-1} + \beta_3 S_t + \beta_4 ER_t + \beta_5 DS_{t-1} + \beta_6 CI_t + \beta_7 V_t + \varepsilon_2 \quad (2.1)$$

Capital inflow equation:

$$CI_t = \sigma_0 + \sigma_1 CI_t + \sigma_2 Y_t + \sigma_3 DS_t + \sigma_4 D_{t-1} + \sigma_5 S_t + \sigma_6 X_t + \varepsilon_3 \quad (3.1)$$

Where SDS_t is the interactive term to estimate ‘debt overhang- resource curse’.

3.2 MODEL SPECIFICATION

To the author’s knowledge, other than Manzano and Rigobon (2001) there are hardly any published sufficiently clear attempts to analyse the impact of debt on growth whilst taking into consideration natural resources. This first empirical analysis of this thesis seeks to answer the already mentioned research questions by estimating the model which specification follows. Employing the information from the theoretical framework, and using Equations (1.1), (2.1) and (3.1) , the following system of linear equations are specified for estimation:

Output Equation:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 L_t + \alpha_3 DS_{t-1} + \alpha_4 CI_{t-1} + \alpha_5 S_t + \alpha_6 SDS_{t+} + \alpha_7 HC_t + \alpha_8 IN_t + \alpha_9 IP_{t-1} + \alpha_{10} DA_t + \varepsilon_1 \quad (1.2)$$

Where: HC_t is human capital, IN_t is inflation, IP_{t-1} is lagged income per capita and DA_t is domestic absorption.

Debt Equation:

$$DS_t = \beta_0 + \beta_1 Y_t + \beta_2 D_{t-1} + \beta_3 S_t + \beta_4 ER_t + \beta_5 DS_{t-1} + \beta_6 CI_t + \beta_7 TO_t + \beta_8 FB_t + \beta_9 CR_t + \beta_{10} GV_t + \beta_{11} SA_t + \varepsilon_2 \quad (2.2)$$

Where TO_t is terms of trade, FB_t is fiscal balance, CR_t is credit constraint, GV_t is initial government size and SA_t is domestic savings.

Capital inflow equation:

$$CI_t = \sigma_0 + \sigma_1 CI_t + \sigma_2 Y_t + \sigma_3 DS_t + \sigma_4 D_{t-1} + \sigma_5 S_t + \sigma_6 ER_t + \sigma_7 IR_t + \sigma_8 OP_t + \sigma_9 (CI_t/Y_t) + \sigma_{10} (CI_t/D_t) + \varepsilon_3 \quad (3.2)$$

Where: IR_t is interest rate, OP_t is openness, (CI_t/Y_t) is the ratio of capital inflow to the GDP and (CI_t/D_t) is the ratio of capital inflow to debt stock.

Therefore, the model to be estimated is a system of equations endogenous in Y_t , DS_t and CI_t respectively and all the ε 's are error terms. These three variables being estimated simultaneously capture the dynamic nature of the economy and provide estimates for the simultaneous economic activities surrounding filling the internal and external gaps as explained by Chenery and Strout (1966).

'Capital inflows' is essentially included because all the economies considered in this investigation are open economies. These flows also supplement domestic revenue. Hence it would be quite limiting to estimate the described model wherein resource rents is the only source of domestic revenue.

3.3 EXPLANATORY VARIABLES AND EXPECTED SIGNS

A major shortcoming of many empirical studies is that most regress output growth on randomly selected potential determinants. This often results in estimates that are sensitive to other conditional variables (Levine and Renelt, 1992; Bosworth and Collins, 2003). In this research, selected explanatory variables have therefore been consistently associated with growth and debt in the literature.

The output equation, Equation (1.1), shows that economic growth is dependent on growth in the labour force, debt service, natural resources, capital inflow and carefully selected growth variables. The growth variables contained in vector, Z_t for the purposes of this study are human capital, inflation, and lagged income per capita and domestic rate of absorption. Lagged income per capita is included to test for convergence, as in a standard Barro growth model, and is expected to have a negative coefficient. All the factors of production are expected to have a positive impact on output growth. This will lead to an increase in demand, which is stimulated by domestic absorption. This effect further generates increases in the use of capital and labour. The sign on the coefficient of natural resources is undetermined, as it is one of the relationships this thesis wishes to investigate and therefore does not intend to view the curse as an inevitable outcome of resource endowment. The coefficients continue to be 'undetermined' in the debt and capital inflow equations. Based on findings by the available empirical literature, it is possible for these coefficients to be either positive or negative. Debt service is expected to have a negative impact of output growth. From the perspective of the debtor economy, debt service is a tax on output. Capital inflow adds to resources available for production, thus increasing output and having a

positive impact on growth. It also enables consumers to smooth out consumption over time. Human Capital is expected to have a positive coefficient on growth, as it increases output growth through increased efficiency in production and greater absorption of technology transfers. The sign on the coefficient of the debt-overhang interactive variable is also undetermined as no a priori assumptions are made regarding it in this thesis.

The debt service equation, Equation (2.1), illustrates the relationship between debt service and output growth, stock of debt, exchange rate and debt variables contained in V_t . Both debt service and the stock of debt are included in the equation in order to differentiate between the effects of debt overhang and 'crowding out'. The vector V_t contains terms of trade, fiscal balance, credit constraint, initial government size and domestic savings. Terms of trade reflect the external shocks to the economy and fiscal balance is assumed to account for the effects of macroeconomic sustainability and stability of productivity. The initial size of government is expressed as government consumption as a ratio of gross domestic product (GDP). The coefficient on debt stock is expected to be positive. This study assumes that, with a given interest rate, the higher the stock of debt, the higher the level of debt servicing. The exchange rate is expected to be positively related to debt service. A weak currency is often associated with exchange rate risk, which reduces the likelihood of foreign investment, thus giving rise to the need for increased lending. Positive terms of trade reflect increases in exports which are significant sources of foreign exchange, especially for developing countries. The coefficient on terms of trade is therefore expected to be negative, indicating that debt service decreases when the terms of trade improve, ceteris paribus. Debt service does not only affect output growth, output growth also affects the level of debt service. Output growth is thus expected to have a negative relationship with debt service. If the economy grows at a high rate, it reduces the need for debt accumulation and thus lower debt servicing requirements. The impact of fiscal balance on debt service depends on the type of fiscal balance (surplus or deficit). If an economy is faced with greater credit constraints (debt/GDP), greater levels of debt servicing are expected. Increased domestic savings help plug the savings gap in the economy and reduce the need for external funding. Domestic savings are expected to have a negative coefficient. It is assumed that, given a level of output, the larger the initial government size (government consumption/GDP), the larger the need for external borrowing, thus debt service.

The capital inflow equation, Equation (3.1), demonstrates that capital inflow is dependent on output growth, stock of debt and variables contained in vector, X_t . These variables are the exchange rate, interest rate and openness. Economies that experience output growth are often willing to offer higher interest rates, which will attract more capital inflows. This study expects positive coefficients on output growth and interest rates. Openness promotes trade, and hence increases capital inflows, so it is expected to have a positive relationship with capital inflow in the model. Debt stock is anticipated to

have an inverse relationship with capital inflows. External debt levels may indirectly affect output growth by discouraging the formation of capital and boosting capital flight. This implies that increases in debt stock would lead to decreases in capital inflow.

The expected relationships between the dependent variables and main variables of each equation in this model have been explained. The variables contained in each vector have also been examined. The data that will be used in the estimation is described in the next section.

3.4 DATA DESCRIPTION

This analysis uses a time series data set that covers 153 countries over the period 1970 to 2011. The data is collected from several sources. The countries included in the various subsets are based on the World Bank definitions. For the resource-rich countries, states that are specifically rich in point-source non-renewable resources such as minerals and petroleum are considered.

For the purposes of this study and as the common consensus in the empirical literature, GDP is used as the measure of output. Labour is the total number of people in the labour force. Capital inflow is the sum of both inward foreign direct investment and grants. Domestic absorption is calculated as the sum of investment, consumption, government expenditure and exports, less imports. Inflation is taken from the consumer price index. The exchange rate is the official exchange rate against the US dollar for each economy. The variable, terms of trade, is the ratio of exports to imports. Initial government size is measured by government consumption as a share of GDP. The variable ‘credit constraint’ is measured by the debt-to-GDP ratio. Openness to trade is the sum of exports and imports as a percentage of GDP. Secondary school enrolment is used as a proxy for human capital. The ratio, Debt/GDP, is used to represent the stock of debt. Debt service is included to measure the financial burden of the stock of debt. To distinguish between debt overhang and crowding out, this study uses both debt service and stock of external debt in the estimation. Natural resources are represented by total resource rents.

Data for all the variables are collected from Global Development Finance Indicators and World Development Indicators (April, 2012 edition), and the dataset published by the World Bank is accessed from the Economic and Social Data Service, now part of the UK Data Service, and official national statistics published by the various countries. The groupings of the panel subsets estimated are based on World Bank definitions. The subsets are: Heavily Indebted Poor Countries (HIPC), Least Developed Countries (LDCs), members of the Organisation for Economic Co-operation Development (OECD), members of the Organisation of Petroleum Exporting Countries (OPEC) and Sub-Saharan African Countries (SSA). Data on resource-rich countries is collected from the Central Intelligence Agency

World Fact book 2009. This study has selected countries with mineral and petroleum endowments of commercial importance.

Three year averages of all the series are calculated to net out short run fluctuations, while maintaining the time series nature of the data. This is important given that debt affects growth over time. For estimation purposes, most of the variables are growth rates. Monetary value based variables are expressed as a fraction of GDP to aid easy comparison.

3.5 MODEL ESTIMATION

The overall model presented in section 3.2 is made up of three single equations which will be estimated simultaneously. The three equations utilise output, debt stock and capital inflow as the dependent variables, respectively. The dependent variables are also explanatory variables in the three equations; therefore, the model may be subject to endogeneity, resulting in biased estimated coefficients. In consequence, the System Generalised Method of Moments (SGMM) proposed by Blundell and Bond (1998) is used to estimate the system of equations for the panel of countries simultaneously. This method addresses the potential endogeneity of variables, has recently gained popularity and is widely used in applied economic research. Theoretically, the System GMM estimator addresses a variety of biases such as the omitted-variables bias, endogeneity, measurement errors (as long as instruments are white noise) and simultaneous equation bias (Kumar and Woo, 2010). Other studies such as Blundell and Bond (1998), Arellano and Bover (1995) and Pattillo et al. (2002) also utilise the system GMM methodology. The GMM 3SLS estimator is guaranteed to be more consistent than the traditional 3SLS estimator.

The system GMM estimator for dynamic panel data models combines moment conditions for the model in first differences with moment conditions for the model in levels (Bun and Windmeijer, 2009). Hence the model is estimated using time series in levels and the consistency of the system GMM estimator depends on the validity of the instruments. In a bid to ensure that this research selected valid instruments, two specification tests recommended by Arellano and Bover (1995) and Blundell and Bond (1998) have been performed. The first test is the Hansen J-test of over-identifying restrictions. This test checks the overall validity of the instruments by analysing the sample analogue of the moment conditions used in the estimation process. The null hypothesis of this J- test is that the model estimated is valid. This hypothesis is rejected if the J-statistic $>$ Chi square at the 5% level. The results of this test are presented at the bottom of each result table. The second test examines the hypothesis that the error terms are not serially correlated. The results presented in Appendix Two confirm that all the error terms are not serially correlated at the 5% confidence level. The aim is to show that the instrumental variables

are uncorrelated with the residuals, but correlated with the dependent variables. The HAC – Newey West specification of the GMM method is used. The HAC –Newey West weighting matrix is a heteroscedasticity and autocorrelation consistent estimator. It is therefore robust to heteroscedasticity and autocorrelation. The model is estimated using Eviews 8 econometric software.

The analysis proceeds by estimating the model described in section 3.2 for the whole dataset and the various subsets using the System GMM method, whilst ensuring that the final model being estimated has valid instruments. It has been ensured that there are as many instruments as there are coefficients to be estimated. Given the time series nature of the panel data, lagged values of all the variables have been used as instruments, since they are less likely to be influenced by current shocks. All the instruments are applied to the estimation at the same time so as to lower the standard errors. The instruments are tested and confirmed to be uncorrelated with the error terms. Due to the use of instrumental variables, R-squared is no longer bounded between 0 and 1 and has no statistical meaning in this context. The aim here is to achieve accurate estimates of the coefficients of the variables, whilst maintaining valid instruments.

3.6 THE EMPIRICAL RESULTS

The three equations that make up the system have been estimated simultaneously to investigate the debt overhang and resource abundance effect on growth. The results of the estimation for the whole panel of 153 countries are presented in the next section (see Table 1.1), and this is followed by the results of the estimation for the sub-panels.

3.6.1 THE RESULTS OF THE SIMULTANEOUS EQUATIONS FOR THE WHOLE PANEL, 1970-2011.

For the growth equation, all the factors of production are expected to have a positive impact on growth. In Eq. (1.2) of the theoretical framework of the model estimated, capital, labour and natural resources are the factors of production. In Table 1.1, surprisingly, contrary to a priori expectations, only capital inflows had a significant effect on GDP growth, which turned out to be positive. It has been established by the pioneering models for the analysis of growth dynamics, such as the Harrod-Domar model (1946) and the Chenery and Strout model (1966), that capital accumulation drives economic growth and is also responsible for filling the investment and savings gaps. Lagged output is shown to have an inverse relationship with current output, confirming convergence. It is also possible that this inverse relationship is due to the high possibility that consumers in most countries tend to consume more when

more income becomes available, rather than consumption being smoothed out over different time periods.

Table 1.1: Simultaneous Equations Results, 1970-2011, All Countries

Variables	Growth Equation			Debt Equation			Capital Inflow Equation		
	coefficient	t-statistic	p-value	Coefficient	t-statistic	p-value	coefficient	t-statistic	p-value
GDP	-9.12E-17	-0.88002	0.3789	-0.60462	-2.5752	0.0101	0.021192	3.410167	0.0007
Debt Service	-9.92E-18	-0.88002	0.3789	0.918168	55.4583	0.0000			
External Debt Stock				0.014248	2.053378	0.0401	-1.68E-17	-3.46112	0.0005
Capital Inflow	7.74E-26	133.2403	0.0000				0.324620	2.299691	0.0215
Natural Resource	2.91E-18	1.374591	0.1693	-0.001262	-0.38859	0.6976	0.033268	0.133813	0.8936
Human Capital	-1.07E-18	-1.34806	0.1777						
GDP per Capita	-1.71E-17	-0.47729	0.6332				0.008863	0.516475	0.6056
Labour	-3.80E-19	-0.22035	0.8256						
Inflation	-4.00E-19	-2.07909	0.0377						
Domestic Absorption	-1.99E-19	-0.15869	0.8739						
Debt service*resource	1.31E-26	0.375841	0.7071	-0.001285	-0.08327	0.9336	-0.000896	-0.03882	0.9690
Exchange rate				6.69E-10	2.48325	0.0131	0.175323	2.949191	0.0032
Terms of Trade				0.191844	0.59043	0.5549			
Fiscal Balance				-0.000144	-5.3607	0.0000			
Credit Constraint				-0.003390	-0.6112	0.5411			
Government Size				-0.000169	-5.4292	0.0000			
Domestic Savings				-1.429500	-3.12038	0.0018			
Real Interest Rate							-0.004201	-0.04319	0.9656
Openness							-0.083308	-3.20125	0.0014
Ratio of Capital Inflow/GDP							0.248687	3.901867	0.0001
Ratio of Capital Inflow/Debt							10.60527	6.059042	0.0000
J-Statistic: 0.10744									
P-value: 1.00000									

The results failed to reveal any significant evidence of the debt-overhang- resource curse on growth in the panel. This study attributes this outcome to the fact that developed and high income countries are included in the dataset. These countries have good credit ratings, well developed financial markets and can easily access needed capital on the international money market. The size and value of their transactions can possibly cast a shadow over the smaller, low income and less developed economies, thereby reducing the overall effect of debt service on the panel. It is also as a result of certain countries

diversifying resource rents into other sectors of the economy like manufacturing, the service industry and technology transfers and therefore resource rents are not the main drivers of economic growth.

The debt service equation, for the whole panel, reveals that the previous year's debt service has a direct significant relationship with current debt service. This is because permanent refinancing of debt service is the equilibrium strategy employed by most economies (Cohen and Sachs, 1986). Lagged GDP growth has a significantly inverse relationship with debt service. An increase in the previous year's output, all other things being held constant, results in lower debt requirements the following year and thus a decrease in debt service. On the other hand, a decrease in lagged GDP increases the need to acquire more debt to keep utility at equilibrium, thus debt service commitments increase. As expected, debt servicing increases with the stock of available debt, the fiscal balance worsens and reduces domestic savings.

From the capital inflow equation, the coefficients indicate a positive statistical significant relationship between capital flow and lagged growth, openness, the ratio of capital to output and the ratio of capital to debt. As expected, there exists a negative significant relationship between capital inflow and debt due to debt servicing requirements.

Given that the results presented in Table 1.1 fail to show any significant support for the debt overhang-resources curse hypothesis on the whole panel system, this study therefore deduces that the results for the whole panel are inconclusive with regard to the potential debt overhang problem. As in Afxentiou (1993), indebtedness alone cannot account for significantly affected growth. It is, however, clear that capital inflow, driven by trade and investment, and is the most significant determinant of world growth. This is consistent with studies like Fosu (1999), Pattillo et al. (2003) and Schclarek (2004), who find that total factor productivity and investment are the main channels through which debt overhang operates.

3.6.2 THE RESULTS OF THE SIMULTANEOUS EQUATIONS FOR THE HEAVILY INDEBTED POOR COUNTRIES, 1970-2011.

In a bid to evaluate how the level of indebtedness affects the impact of debt and natural resource rents on growth, this thesis estimates the system for a subset of countries containing only HIPC's. The results are reported in Table 1.2. HIPC's are among the world's poorest and most indebted countries. These countries face an unsustainable debt burden, but have qualified to receive debt relief or low-interest loans from the International Monetary Fund and the World Bank on the successful implementation of certain conditionalities and policies.

Table 1.2: Simultaneous Equations, 1970-2011, HIPC Countries

Variables	Growth Equation			Debt Equation			Capital Inflow Equation		
	coefficient	t-statistic	p-value	Coefficient	t-statistic	p-value	coefficient	t-statistic	p-value
GDP				-0.057189	-0.81581	0.4148	10476521	1.65917	0.0974
Debt Service	-2.33E-05	-1.08333	0.2790	-0.037488	-3.22661	0.0013	9537182	1.95119	0.0514
External Debt Stock				0.042911	2.277571	0.0230			
Capital Inflow	4.10E-25	3.040954	0.0024				0.531994	7.95635	0.0000
Natural Resource	7.24E-18	0.436622	0.6625	-0.016566	-0.86999	0.3846	9101466	4.06353	0.0001
Human Capital	7.49E-19	0.206216	0.8367						
GDP per Capita	5.46E-18	1.416049	0.1571						
Labour	3.59E-17	1.211732	0.2260						
Inflation	-4.29E-19	-2.89851	0.0038						
Domestic Absorption	1.89E-17	3.334739	0.0009						
Debt service*resource	-2.11E-18	-0.64087	0.5218	-0.000969	-0.24775	0.8044	1860261	1.698459	0.0898
Exchange rate				-0.000102	-1.59833	0.1103			
Terms of Trade				-1.570466	-2.03198	0.0425			
Fiscal Balance				-0.004082	-0.35412	0.7233			
Credit Constraint				-0.017535	-1.59536	0.1110			
Government Size				0.010294	1.68474	0.0924			
Domestic Savings				0.032294	3.549999	0.0004			
Real Interest Rate							-258102.7	-0.21456	0.8302
Openness							719240.7	0.472744	0.6365
Ratio of Capital Inflow/GDP							-0.009834	-2.24387	0.0251
Ratio of Capital Inflow/Debt							5.820879	6.414641	0.0000
J-Statistic: 8.96E+37 P.Value: 0.9833									

Debt servicing is often expected to divert benefits from the domestic economy to the foreign economy. However, the results from the estimation of the growth equation for HIPCs presented in Table 1.2 did not reveal any significant evidence of neither a negative impact of debt service and natural resources on growth nor debt overhang. The results from this sub-panel are contrary to the findings of studies such as Cunningham (1993), Sawada (1994), Deshpande (1997), Chowdhury (2001) and Presbitero (2006), who found a significant negative link between economic growth and debt in HIPCs.

This finding can be attributed to the main characteristic of HIPCs: these countries have received debt relief from their creditors. In addition, on reaching HIPC completion point, these countries must implement a Poverty Reduction Strategy Paper (PRSP). Quite often this strategy paper requests large expenditure on education and health, whilst maintaining macroeconomic stability thus domestic savings

are inadequate. Savings shortfalls can affect the sustainability of growth. Researchers such as Auty (1993) and Atkinson and Hamilton (2003) reveal that resource-rich countries consume their resource rents rather than save or reinvest.

Despite the debt relief received, these countries often do not export enough to earn and trade sufficient foreign currency on the world foreign exchange and capital markets and hence continue borrowing and receiving foreign aid. These countries continually strive to meet spending quotas on education, training and health, in order to reach 'HIPC Decision Points'. They also receive technical assistance and low-interest loans from their lenders, in this case mainly the IMF and World Bank; hence the absence of a debt overhang effect on resource based growth. Hansen (2004) argues that debt overhang is a negligible issue in HIPC countries because they have larger aid inflows than debt inflows.

The results of the estimation of the Debt Equation indicate that debt stock has a direct statistically significant relationship with debt service for the panel of HIPC countries. The results also reveal significant inverse relationships between terms of trade and debt service. This provides support for the assumption regarding the 'external gap' made by Chenery and Strout (1966).

For this sub-panel, natural resource rents and debt service have positive significant bearings on capital inflow, as shown in the capital inflow equation. This shows that countries that successfully service their debt, relay positive signals to investors resulting in investment inflows and the natural resource extractive industry continues to be an attractive investment destination.

3.6.3 A COMPARATIVE ANALYSIS OF THE RESULTS OF THE SIMULTANEOUS EQUATIONS FOR THE OECD COUNTRIES, AND LEAST DEVELOPED COUNTRIES, 1970-2011.

The level of economic development indirectly affects output growth. This impact can be transmitted via various inputs and policies. To highlight how varying levels of economic development might affect the role of debt and resource rents on growth, a subset of OECDs and LDCs has been estimated. Members of the Organisation for Economic Co-operation and Development (OECD) are developed countries. These countries typically experience high income levels, set global standards in economic and development policies, enjoy good quality institutions and high levels of the main human development indicators. Least Developed Countries (LDCs), on the other hand, typically experience low income levels, low human development indicators and low indicators of socio-economic development. This comparative analysis not only intends to point out the varying impact of debt and

resources on the growth of the two sets of countries, but will also highlight the underlying impact of other theories highlighted in the resource curse literature such as human capital, Dutch disease and institutional theories. Other underlying factors include income levels and stage of development. The results are presented in Table 1.3 and Table 1.4.

Table 1.3: Simultaneous Equations, 1970-2011, OECD Countries

Variables	Growth Equation			Debt Equation			Capital Inflow Equation		
	Coefficient	t-statistic	p-value	Coefficient	t-statistic	p-value	coefficient	t-statistic	p-value
GDP	-2.79E-26	-49.9171	0.0000	0.176419	2.049680	0.0415	-3228544	-1.11592	0.2656
Debt Service	-3.35E-17	-1.97266	0.0497	1.079221	48.74102	0.0000	767593.2	0.996883	0.3198
External Debt Stock				0.029462	1.500643	0.1348	2279365	2.124861	0.0346
Capital Inflow	1.21E-25	0.271665	0.7861	-7.66E-10	-1.73343	0.0843	0.316595	14.47819	0.0000
Natural Resource	1.95E-17	1.412687	0.1590	-0.013568	-0.40264	0.6876	1574796	2.970990	0.0033
Human Capital	0.019297	1.977750	0.0482						
GDP per Capita	-3.56E-17	-0.21646	0.8288						
Labour	4.76E-18	0.200941	0.8409						
Inflation	9.59E-19	0.323224	0.7468						
Domestic Absorption	1.49E-17	1.137520	0.2565						
Debt service*resource	-5.42E-27	-0.06572	0.9477						
Exchange rate				-0.006801	-1.63779	0.1028			
Terms of Trade				-1.236117	-1.03127	0.3035			
Fiscal Balance				-0.052560	-1.50235	0.1332			
Credit Constraint				-1.86E-10	-3.87202	0.0001			
Government Size				0.011874	3.646593	0.0003			
Domestic Savings				0.016983	1.762286	0.0782			
Real Interest Rate							1705951	3.234525	0.0014
Openness							-219228.0	-0.96073	0.3377
Ratio of Capital Inflow/GDP							0.767525	3.242616	0.0014
Ratio of Capital Inflow/Debt							767593.2	0.996883	0.3198
J-Statistic: 0.17075									
P-value: 0.91816									

Lagged GDP has a negative significant impact on current GDP for the panel of OECDs, whilst it has no significant impact on current GDP for LDCs. It is evident that OECDs reinvest output growth to further increase production, whilst the contrary is true for LDCs. It also shows that OECDs are better

at 'smoothing out' consumption over successive time periods compared to the consumption patterns of LDCs.

Debt service has an inverse relationship with output growth in both panels. The recent debt crisis has resulted in the public debt of certain OECDs passing annual GDP in 2011, and in some cases it is still rising. Elmeskov and Sutherland (2012) explain that external debt servicing can negatively affect the growth of OECDs through the rising cost of capital. The highly significant negative impact of debt service on LDC growth has its underpinnings in the uncertainty surrounding their growth and repayment capabilities. Claessens et al. (1993) and Aizenman and Marion (1999) have shown that increased uncertainty affects the supply of international credit available to indebted countries. A study conducted by the World Bank (1989) maintains that the debt service payments made by LDCs hinder their growth. The results also reveal a clear debt overhang-resource curse impact on growth in LDCs and not for OECDs, as shown by the significant negative coefficient on the interactive term in the LDC panel. This study concludes that economic growth in LDCs is more sensitive to debt service movements than the growth of OECDs; thus, the debt-overhang effect is stronger in LDCs.

Comparing the results from both Table 1.3 and Table 1.4, it is clear that natural resources have a positive on growth in both panels, but with the effect of LDC growth being more statistically significant. OECD countries have experienced relative success in diversifying production into other sectors of the economy, resulting in all-round growth. Their growth is not heavily driven by resource rents. They also have better institutions, better corruption indices and better absorption capacities. This is supported by the significant direct relationship OECD growth shares with human capital. This relationship is not evident in LDCs but labour in LDCs have a significant positive impact on growth. The growth enhancing effect of human capital is well-documented in the literature; for example, Davis (1995), Bravo-Ortega and De Gregorio (2005), and Stijns (2006). Mursheed (2003) deduces that rich endowment in natural resources becoming a curse is conditional on inappropriate policies being practiced. This implies that, with comparatively better policies being practiced in OECDs, there is no resource curse.

From the debt equation, GDP growth has a more significant direct relationship with debt service in LDCs compared to OECD countries. Whilst the results indicate a positive significant relationship between lagged debt services with current debt service in the panel of OECD countries, but did not show any significant relationship in the case of LDCs. This vice-versa relationship across the different subpanels is also true in the case of debt stock. A significant inverse relationship between OECD debt service and credit constraint is revealed. On the other hand, debt service increases with a fall in fiscal balance in the case of LDCs.

The results from the capital inflow reveal that natural resource rents have a positive significant bearing on capital inflows in both OECDs and LDCs. This shows that natural resources do have the potential to enhance growth but it is conditional on other underlying factors given the dynamic nature of economies.

The conclusion therefore is there is evidence of debt overhang in LDCs but not OECDs based on historical data. This illustrates that varying levels of development which encompasses level of financial and social development, impacts on the final impact that resource endowments and debt have on economic growth.

Table 1.4: Results of Simultaneous Equations, 1970-2011, Least Developed Countries

Variables	Growth Equation			Debt Equation			Capital Inflow Equation		
	Coefficient	t-statistic	p-value	coefficient	t-statistic	p-value	coefficient	t-statistic	p-value
GDP	-0.591626	-0.81089	0.4176	0.093116	2.371666	0.0179	13463057	1.61225	0.1072
Debt Service	-1.08E-17	-14.2011	0.0000	-4.516379	-0.62968	0.5290	30090840	1.808219	0.0708
External Debt Stock				0.020586	1.988721	0.0470	-2865608	-0.41759	0.6763
Capital Inflow	5.74E-26	0.330197	0.7413				0.858277	16.42405	0.0000
Natural Resource	7.10E-19	10.87948	0.0000	-0.000158	-0.02559	0.9796	3556229	2.179233	0.0295
Human Capital	1.63E-17	0.289237	0.7725						
GDP per Capita	1.49E-15	0.793209	0.4278						
Labour	1.19E-18	5.444836	0.0000						
Inflation	-2.92E-20	-2.77508	0.0056						
Domestic Absorption	1.60E-22	0.004906	0.9961						
Debt service*resource	-3.06E-21	-79.4005	0.0000	-8.06E-06	-1.83931	0.0661	-1586.022	-0.90848	0.3638
Exchange rate				-3.68E-05	-1.05177	0.2931			
Terms of Trade				0.361023	1.021875	0.3071			
Fiscal Balance				-0.000148	-2.48097	0.0132			
Credit Constraint				1.84E-11	0.683246	0.4946			
Government Size				-0.011259	-0.86393	0.3878			
Domestic Savings				-0.004068	-0.58943	0.5557			
Real Interest Rate							1402090	0.828435	0.4076
Openness							-2261435	-2.28564	0.0225
Ratio of Capital Inflow/GDP							0.066035	2.082336	0.0375
Ratio of Capital Inflow/Debt							577.7344	0.894280	0.3714
J-Statistic: 0.100443									
P-value: 0.9510									

3.6.4 A COMPARATIVE ANALYSIS OF RESULTS OF THE SIMULTANEOUS EQUATIONS FOR MINERAL RICH COUNTRIES, PETROLEUM RICH COUNTRIES AND OPEC MEMBERS, 1970-2011.

This section presents results from testing the hypothesis under review for mineral rich, petroleum rich and OPEC member countries. The separation into mineral rich and petroleum rich countries is motivated by views that the resource curse is resource specific. At the forefront are studies that have illustrated that the more ‘lootable’ a resource is, the greater the possibility of the resource curse. The addition of OPEC members is motivated by economic trends over the years. The price of oil has fluctuated during this period, but on average has increased steadily. OPEC countries strongly influence world oil supply and prices, hence having an advantage over other countries. The comparative analysis of the results of the three subpanels presented in Table 1.5, Table 1.6 and Table 1.7 will shed light on whether the type of resource or belonging to OPEC can alleviate the possibility of the Debt Overhang-Resource Curse.

This section details the results for mineral rich countries, petroleum rich countries and countries that are members of the Organisation for Petroleum Exporting Countries (OPECs). For the purpose of this discussion, mineral rich countries are those that have precious minerals and metals of commercial value. Petroleum rich covers petroleum, coal and natural gas. The key to this comparison is to highlight whether the potential debt-overhang effect of resources is specific to mineral resources, or specific to petroleum resources or the advantages of being a member of OPEC. Minerals are generally easier to smuggle compared to petroleum and other fuels. This analysis will also point out whether the ‘lootability’ of the resource contributes to the impact of debt on growth in resource-rich countries.

Table 1.5: Simultaneous Equations, 1970-2011, OPEC Countries

Variables	Growth Equation			Debt Equation			Capital Inflow Equation		
	coefficient	t-statistic	p-value	coefficient	t-statistic	p-value	coefficient	t-statistic	p-value
GDP	0.616928	1.602920	0.1106	-0.381243	-3.12646	0.0020	5090853	2.094615	0.0375
Debt Service	-0.167024	-1.16772	0.2444	0.817111	7.359230	0.0000	-1641702	-3.56537	0.0005
External Debt Stock				0.053233	2.671909	0.0082	-230381.2	-0.35856	0.7203
Capital Inflow	7.48E-22	2.579866	0.0106	4.56E-09	1.423159	0.1563	0.138362	3.086226	0.0023
Natural Resource	2.66E-14	2.783246	0.0059	0.085823	2.836609	0.0050	2.879773	2.382412	0.0182
Human Capital	0.054443	1.638548	0.1029						
GDP per Capita	0.421707	1.080945	0.2811						
Labour	2.98E-14	2.441791	0.0155						
Inflation	0.001102	0.328056	0.7432						
Domestic Absorption	2.50E-15	0.905660	0.3663						
Debt service*resource	9.22E-08	0.785630	0.4331						
Exchange rate				2.04E-05	1.300224	0.1951			
Terms of Trade				2508.996	3.081698	0.0024			
Fiscal Balance				0.030454	1.168302	0.2441			
Credit Constraint				2.74E-11	1.459565	0.1460			
Government Size				-0.006772	-0.41156	0.6811			
Domestic Savings				0.031608	1.082528	0.2804			
Real Interest Rate							-241519.2	-0.62098	0.5353
Openness							510052.1	4.166333	0.0000
Ratio of Capital Inflow/GDP							-0.024003	-3.48034	0.0006
Ratio of Capital Inflow/Debt							3.521709	3.304988	0.0011
J-Statistic: 0.138692									
P-value: 0.93300									

Considering the growth equation across the three sub-panels, lagged GDP growth has a positive significant effect on current GDP growth for only the petroleum-rich group of countries. The Interagency Task Force on Commodities has reported that petroleum production lags behind world GDP growth. This puts demand side pressures on petroleum producing countries, leading to increases in the price of petroleum and energy products. This cycle provides some explanation for the highly significant positive effect of lagged GDP growth on current GDP growth in petroleum rich countries.

Natural resource rents positively impact on growth in all three sub-panels. It is clear that, from the panel results, petroleum rich countries have succeeded in overcoming the ‘Dutch disease’ effect of their endowments. According to Ross (2004), the ‘lootability’ which is determined by the type of resource is crucial in determining the impact of resources on growth. Ross (2004) explains that ‘lootable’

resources such as diamonds prolong conflict and thus adversely affect growth. This investigation has failed to find any evidence of this in the current panel estimation. The results also conflict with the Rentier theory of the resource curse.

Debt service has a highly significant inverse relationship with growth in petroleum rich countries and this study reveals a similar relationship in the case of mineral rich countries. The estimation however did not indicate significant evidence of the debt service –growth relationship in the case of OPECs. This can be illustrated by the fact that, as of January 31st 2012, OPEC purchased \$43.3 billion, or 20% of U.S. government debt (U.S. Treasury Department). The reverse is evident in the case of capital inflows. Capital inflows have a significant positive impact on growth in OPECs, but this is not the case for petroleum-rich and mineral-rich countries. The debt-overhang-resource curse variable proved to be statistically significant in both mineral rich and petroleum rich countries, providing support for the main hypothesis of this research.

There is positive significant relationship between current and lagged debt service across the three sub-panels as evident from the results of the debt equation. The key to growth therefore lies in the sustainability of debt. Mineral and petroleum rich countries experience a statistically significant inverse relationship between fiscal balance and debt service. This shows that mineral rich and petroleum rich countries essentially use debt for deficit financing and filling their foreign exchange gap. The system estimates also predicts that the debt stock of mineral rich countries, petroleum rich countries and OPECs directly and significantly influences their debt service payments as expected. Minerals and petroleum and other fuels are largely traded and influence the terms of trade of both the exporters and importers. Evidence from the three sub-panels being compared reveals a significant inverse relationship between terms of trade and debt service for petroleum rich countries whilst the relationship is positive in the case of OPECs.

Natural resources have strong positive links with capital inflow in petroleum rich countries and OPECs. The results of the estimation failed to indicate a significant relationship between resource rents and capital inflows in the case of mineral rich countries. This study believes that Ross' (1994) 'lootability' approach applies here. Minerals, especially diamonds, are easy to smuggle and therefore receipts from the sale of smuggled diamonds hardly ever contribute to formal revenue or output computations.

Table 1.6: Simultaneous Equations, 1970-2011, Mineral Rich Countries

Variables	Growth Equation			Debt Equation			Capital Inflow Equation		
	coefficient	t-statistic	p-value	coefficient	t-statistic	p-value	coefficient	t-statistic	p-value
GDP	-8.80E-26	-0.89697	0.3698	0.239154	0.049920	0.9602	6192424	1.470279	0.1416
Debt Service	-1.66E-17	-18.3786	0.0000	0.961135	45.06060	0.0000	6102000	1.625543	0.1042
External Debt Stock				0.025274	2.418073	0.0157	6937059	2.390091	0.0169
Capital Inflow	8.73E-26	0.668646	0.5038						
Natural Resource	-9.71E-18	-3.32380	0.0009	-0.008746	-1.67316	0.0944	-793416.6	-1.04636	0.2955
Human Capital	3.82E-18	2.163622	0.0306						
GDP per Capita	2.91E-18	0.930979	0.3520						
Labour	3.05E-18	0.694290	0.4876						
Inflation	1.42E-14	2.097154	0.0361						
Domestic Absorption	-1.08E-13	-2.48459	0.0130						
Debt service*resource	-0.041234	-2.30813	0.0211						
Exchange rate				-2.19E-10	-0.54881	0.5832			
Terms of Trade				-0.214270	-0.21427	0.4737			
Fiscal Balance				-0.024914	-2.13512	0.0329			
Credit Constraint				27.23468	0.370477	0.7111			
Government Size				0.007103	1.659456	0.0972			
Domestic Savings									
Real Interest Rate							-1509044	-3.89299	0.0001
Openness							-82879.60	-2.03858	0.0416
Ratio of Capital Inflow/GDP							-1.004298	-2.42242	0.0155
Ratio of Capital Inflow/Debt							-8.229463	-3.54810	0.0004
J-Statistic: 0.021631									
P-value: 0.98924									

Table 1.7: Simultaneous Equations, 1970-2011, Petroleum Rich Countries

Variables	Growth Equation			Debt Equation			Capital Inflow Equation		
	coefficient	t-statistic	p-value	coefficient	t-statistic	p-value	coefficient	t-statistic	p-value
GDP	0.778327	2.827958	0.0048	0.076414	1.528435	0.1266	33165.81	0.072743	0.9420
Debt Service	-5.54E-18	-8.14548	0.0000	0.699929	1.814358	0.0698	-3687809	-0.70788	0.4791
External Debt Stock				0.323209	2.163424	0.0307	1759366	1.116422	0.2644
Capital Inflow	1.17E-22	1.382021	0.1672				0.647951	6.683114	0.0000
Natural Resource	6.76E-19	3.584419	0.0003	0.037645	1.319142	0.1873	1.210277	4.524349	0.0000
Human Capital	6.38E-19	0.414991	0.6782						
GDP per Capita	0.255320	0.858324	0.3909						
Labour	8.42E-14	3.275010	0.0011						
Inflation	1.74E-16	0.275886	0.7827						
Domestic Absorption	-1.32E-14	-1.74294	0.0816						
Debt service*resource	-3.81E-24	-11.4179	0.0000						
Exchange rate				3.01E-05	0.376527	0.7066			
Terms of Trade				-6.020539	-2.07859	0.0378			
Fiscal Balance				-0.059721	-1.87653	0.0608			
Credit Constraint				-1.08E-12	-0.62247	0.5337			
Government Size				0.007344	2.275283	0.0230			
Domestic Savings				0.017331	2.004819	0.0452			
Real Interest Rate							-321522.2	-0.35776	0.7206
Openness							96661.20	0.229547	0.8185
Ratio of Capital Inflow/GDP							2.695630	4.297502	0.0000
Ratio of Capital Inflow/Debt							-2.106661	-1.03047	0.3030
J-Statistic: 0.020164									
P-value: 0.98996									

The results presented in Tables 1.5, Table 1.6 and Table 1.7 show that natural resources promote growth in the sub-sample of countries that is under investigation. The resource rents are statistically significant in all three subsets. The investigation fails to find any evidence of debt overhang in OPEC countries, thus belonging to an oligopoly has unique advantages. There is, however, strong evidence of debt overhang in both mineral rich and petroleum rich countries. This provides support for the finding of Manzano and Rigobon (2001), who also believe that debt overhang is the driving cause of lagging growth in resource-rich countries. Credit market imperfections and the boom-bust cycle of commodity prices, especially minerals and precious metals, increase the volatility of resource revenue, consequently negatively affecting economic growth in resource-rich economies.

3.6.5. THE RESULTS OF THE SIMULTANEOUS EQUATIONS FOR SUB-SAHARAN AFRICAN COUNTRIES, 1970-2011.

Sub-Saharan Africa has one of the largest mineral deposits. In almost half of the countries in this region, non-renewable natural resources account for over 25 % of total exports. In some of these countries, the ratio is over 80% (IMF, 2012). It is, however, home to the highest number of LDCs, low income countries, HIPCS, civil conflicts, corrupt regimes and countries ranking very low on the Human Development index. Therefore despite its natural endowments, it is still generally lagging behind other regions in terms of growth. In recent times, however, a lot of attention has been paid to the plight of the region. Given the debt and banking crises in Europe and the United States, a lot of investment is aimed at Africa, where most of the banks emerged relatively unscathed from the recession of the 'West'. Companies in the extractive industry have also increased investment and stepped up production in the region. SSAs growth experience within the debt overhang-resource debate is therefore very relevant to recent global business and investment trends.

Even though it is discovered that natural resource rents positively affected growth, the relationship was found to be not as significant as might be expected. Studies such as Wood and Mayer (1998) and Gylfason (2000) find that Africa's low ratio of human capital to natural resources is one determining factor in its shortfall in economic performance. The significant, but negative relationship between human capital and growth in this panel of SSA countries can explain some of the reduced impact of natural resources on growth in the panel results presented in Table 1.8. The characteristics of SSA countries also influence the transmission of the impact on resources on growth in the region. Most of these countries are low income, highly corrupt, have poor institutions and underdeveloped manufacturing sectors, and are highly indebted. These factors limit the growth potential from their resource endowments.

Debt service has a statistically significant negative relationship with SSA economic growth. Servicing debt negatively impacts on the region's growth potential. The estimate of the negative relationship between capital inflows and growth in SSA reveal a severe capital flight problem and the human capital link, shows evidence of probable 'brain drain'. A significant manifestation of the debt overhang-resource curse hypothesis was also disclosed in the SSA panel. Studies such as Scott (1995), Fosu (1996, 1999) and Ndung'u (1998) obtained similar results for their sample of SSA countries. This is consistent with the conclusions of Iqbal and Kanbur (1997) and Clements et al. (2003) that explain that the gains from capital inflows are 'taxed away' by existing creditors through debt service payments. This research therefore concludes that the debt overhang effect is in part responsible for the lagging growth of SSA.

Table 1.8 Simultaneous Equations, 1970-2011, Sub-Saharan African Countries

Variables	Growth Equation			Debt Equation			Capital Inflow Equation		
	coefficient	t-statistic	p-value	coefficient	t-statistic	p-value	coefficient	t-statistic	p-value
GDP	-8.51E-18	-0.48676	0.6265	0.017679	0.669244	0.5035	22263291	2.710427	0.0068
Debt Service	-1.86E-16	-2.51227	0.0121	0.805323	31.12083	0.0000	-1699735	-2.21915	0.0266
External Debt Stock				0.030085	3.299602	0.0010	-6069169	-1.70399	0.0886
Capital Inflow	-4.66E-25	-2.33991	0.0194	-1.76E-10	-2.10771	0.0352	0.496845	5.725159	0.0000
Natural Resource	4.83E-18	1.009801	0.3128	-0.011758	-3.38893	0.0007	1886364	2.182455	0.0293
Human Capital	-1.25E-17	-1.83243	0.0671						
GDP per Capita	4.99E-16	3.127687	0.0018						
Labour	2.53E-18	0.451983	0.6514						
Inflation	-1.65E-18	-4.057785	0.0001						
Domestic Absorption	5.58E-18	1.817758	0.0693						
Debt service*resource	-2.04E-20	-2.49626	0.0127						
Exchange rate				-4.22E-10	-1.92480	0.0545			
Terms of Trade				0.673102	2.836796	0.0046			
Fiscal Balance				-0.014429	-1.66697	0.0958			
Credit Constraint				1.39E-11	0.322293	0.7473			
Government Size				-0.004990	-2.81831	0.0049			
Domestic Savings				-0.005167	-1.10482	0.2694			
Real Interest Rate							-3206605	-1.78343	0.0747
Openness							-1638260	-6.20164	0.0000
Ratio of Capital Inflow/GDP							3.454068	6.122376	0.0000
Ratio of Capital Inflow/Debt							-20.76182	-0.22032	0.8257
J-Statistic: 0.100443									
P-value: 0.9510									

From the results of the debt equation, in Table 1.8, the system shows that debt stock and lagged debt service have significant positive relationships with current debt service payments by SSA countries. These countries are in a cycle of borrowing and repaying. When debt reaches unsustainable levels, they pursue conditionalities imposed by lenders to qualify for debt relief (Krugman, 1988; Basu, 1997). This is evident from the fact that of the forty HIPCs, 34 are found in SSA. Natural resources have a negative significant relationship with debt service.

For all the models estimated, the results of the Hansen J-test of over-identifying restrictions (at the bottom of each table) fail to reject the null hypothesis, that the model estimated is valid. The second diagnostic test examines the hypothesis that the error terms are not serially correlated. The results

presented in Appendix Two confirm that all the error terms are not serially correlated at the 5% confidence level.

From the results presented, the general conclusion is that there is evidence to support the Debt Overhang- Resource Curse hypothesis. It is however not a universal phenomenon, nor is it inevitable consequence of resource abundance. Debt overhang is however a significant determinant in the potential resource curse faced by resource-rich economies. The impact on growth is, however, not isolated; many of the underlying factors already tested and proven in the existing resource curse and debt theory do have effects on growth via various transmission channels.

In summary, when the whole panel was estimated, there was no support for the Debt Overhang-Resource Curse hypothesis. Debt stock and debt service, however, share a significant direct relationship for that panel. In the case of HIPCs, the Debt Overhang-Resource Curse hypothesis was also rejected. The results also reveal a debt overhang effect in LDCs compared to OECDs. The debt overhang effect was also significant in mineral rich economies and petroleum rich economies. The results for the OPECs sub-panel showed no support for the debt overhang -resource curse hypothesis, whilst it was supported by the results from the SSA estimation.

On examination of the key relationships described by the debt equation, debt stock showed a significantly positive bearing on debt service for the whole panel, HIPCs, LDCs, Mineral Rich, Petroleum Rich, OPECs and SSA. This reveals that most countries are stuck in a permanent cycle of borrowing and servicing debt. Capital inflows were among the most significant determinants of growth in all the panels. These results have shown that the simultaneous impact of debt and resource rents on growth vary with levels of economic development, levels of indebtedness, the relationship with creditors, the type of resource endowment and geographical location.

As is always the case with quantitative analysis, the results are never unanimous. Due to the lack of consistency from empirical studies, Stevens (2003) argues that a case-by-case approach rather than some sort of generalisation is the way forward in investigating the resource curse hypothesis. Against this background, the second paper of this thesis is a country specific study. The next set of results will be specific to the case of Sierra Leone. However, the methodology will be very rigorous and can be applied to other countries. Moreover, robust results are guaranteed, especially for the purpose of the greater alignment of policy and empirical results.

CHAPTER FOUR

DEBT OVERHANG, NATURAL RESOURCES AND GROWTH: A TIME SERIES ANALYSIS OF SIERRA LEONE'S EXPERIENCE.

4.1 INTRODUCTION

In Chapter Three of this thesis, 'Debt Overhang, Natural Resources and Growth: Panel Data Analysis', the results presented are quite general. Stevens (2003) argues for a case by- case approach rather than some sort of generalisation as the way forward in investigating the resource curse hypothesis. Against this background and for the purpose of greater alignment of policy to empirical results, in this chapter , the analysis proceeds by testing the same hypothesis for the case of Sierra Leone.

Why Sierra Leone? Sierra Leone is rich in natural resources and heavily indebted but recently has been receiving large growth projections. Sierra Leone experienced an eleven year civil conflict the roots of which were widely believed to lie in its endowment of diamonds. Sierra Leone's mining sector has recovered significantly from the war and produced more than 400,000 carats of diamonds in 2010, making the country the world's 10th-largest producer of diamonds (Revenue Governance Index, 2013). Prior to reaching HIPC completion point in December 2000, the average growth rate of debt service in Sierra was 16%. This increased to 26% between 2007 and 2011 (Public Debt Report, 2011). The discovery and extraction of iron ore and the expansion of the extractive sector resulted in Sierra Leone's real GDP growth leaping from 6% in 2011 to 16.7% in 2012 (African Economic Outlook, 2013). The influx of extractive companies, expansion of the primary industry and the discovery of offshore oil reserves in 2009 improves prospects for growth.

The current Finance Minister, Kaifala Marah, forecasts growth of 15.1% in 2013 and the International Monetary Fund has named Sierra Leone one of the fastest growing economies in Sub-Saharan Africa (Bloomberg,2013). In spite of these glowing growth figures, the 2013 Human Development Index (HDI) ranks Sierra Leone at 0.336, 180th out of 187 countries. It is clear that economic growth does not translate into development in the case of Sierra Leone. However, this research is of the opinion that there is a strong need to evaluate the impact of past trends and highlight areas for improvement. If not, when all these resources dwindle, there will be no tangible evidence of development, just a series of growth figures in a database. This chapter can be considered as one of the initial steps to looking back with the aim of moving forward.

One might be tempted to think that this is simply an extraction of the Sierra Leone series from the panel estimated in the previous chapter. However, this estimation is not a mere extraction. It is a modification of the model estimated in the first chapter to test the Debt overhang- Resource curse hypothesis in more detail for the case of Sierra Leone. Most of the explanatory variables are the same, but a few new variables are included not only to directly test the debt overhang-resource curse hypothesis, but also to test the strength of some of the key theories that have been suggested in the theoretical literature to explain the potential resource curse in resource rich countries; for example, institutional explanation and conflict based curse. The effects of these theories are simultaneously compared with the debt overhang theory to determine the theory that best explains Sierra Leone's resource-economic growth experience.

This empirical investigation of the nature of the debt –resource growth relationship in Sierra Leone does not end with the Generalised Method of Moments System estimation. In addition to carrying out cointegration tests, this thesis like studies such as Afxentiou (1993), Chowdhury (2004) and Reinhart and Rogoff (2009), carries out causality analysis between key economic relationships relevant to the debt overhang-resource curse debate. This is essentially to highlight long term relationships for policy formulation and implementation.

4.2 SIERRA LEONE LITERATURE REVIEW

From the literature review in the first chapter, it is clearly noticeable that, with regards to the debt overhang –natural resource debate, there are only a few empirical studies that are focused entirely on Sierra Leone. Most of the time, Sierra Leone only features as part of a dataset, in panel or cross-sectional studies. It is mostly included in datasets evaluating least developing countries, Sub-Saharan African countries, low income countries or Heavily Indebted poor countries. When the empirical literature specifically relating to studies of natural resources in Sierra Leone is reviewed, the main theoretical explanations for the potential 'resource curse' are mainly limited to conflict, inequality and the quality of institutions. Ibrahim Kamara, Sierra Leone's U.N. ambassador, said in July 2000: "We have always maintained that the conflict is not about ideology, tribal or regional difference....The root of the conflict is and remains diamonds, diamonds and diamonds." Sierra Leone's former Minister of finance, James Jonah (2000), also famously said: "The war in Sierra Leone is simply about diamonds."

Resources and Conflict:

Ross (1999; 2003) is among the researchers who have examined the resource –growth link. His studies emphasised the conflict –resource curse link. Ross (1999; 2003) reveal that the key natural resources and illegal drugs strongly influenced the onset and duration of civil wars that took place between 1990 and 2000. His studies also suggested that the high value-to-weight ratio of a resource, and the ease of being transported by unskilled workers (loot ability) define the impact a resource will have on the prospect for war. Diamonds, one of Sierra Leone’s major exports possess these characteristics, hence their emergence as one of the leading causes of the conflict. In the model estimated by Hodler (2004), diamond rich countries like Sierra Leone and Angola experience much higher fighting intensity, weaker property rights and much lower incomes. Maconachie and Binns (2007) suggest that diamonds fuelled the brutal civil war in Sierra Leone during the 1990s, hence Sierra Leone’s identification with ‘blood diamonds’.

Resources and Loot ability:

Ross (1999; 2003) also point out that in non-conflict circumstances, compared to ‘un-lootable’ resources, ‘loot able’ resources produce more widespread benefits for local people. This reaffirms the findings of Binns (1981) and Rosen (1974), who found that in the 1970s in Sierra Leone (pre –conflict), the perception of a negative impact of diamond mining on farming was, far from the truth. After conducting a field based study undertaken between 2002 and 2007, Maconachie and Binns (2007) conclude that many of the links between farming and diamond mining in Sierra Leone had actually been maintained, despite severe disruption during the war. Renner (2002) reveals that diamond wealth had been a source of constant internal friction and that the Revolutionary United Front rebels in Sierra Leone, through their control of the diamond fields, purchased arms and sustained their rebellion during the 1990s.

Resources and vulnerability:

Billon (2001) examines the relationship between resources and armed conflicts. The study highlighted the fact that resource dependent countries become more vulnerable to exploitation through certain business relationships. Taking Sierra Leone as an example, Billon (2001) exposes that rebels in Sierra Leone had links with diamond buyers in New York through a network that included private companies, domestic and foreign authorities and other middlemen. Despite the international trade in diamonds, Chege (2002) points out that Sierra Leone’s economy failed to adequately benefit from diamond extraction because many of the diamonds were “conflict diamonds”. For Sierra Leone, the tainted diamonds, international crime, and poor governance created a failed state. Along similar lines, Gylfason and Zoega (2002) explain that, in the case of Sierra Leone, the supply of diamonds turned out to be a source of conflict and resulted in rent- seeking behaviour that destroyed the infrastructure and social institutions of the country, thereby negatively affecting economic growth.

Resources and Exploitation:

Douglas (1998) examines the exploitation link between resource abundance and growth. In 'Fighting for Diamonds – Private Military Companies in Sierra Leone', he gave an account of the licit and illicit commercial activities that surrounded diamond extraction in Sierra Leone, highlighting the predatory interests of richer and more powerful states. The book revealed that private military companies benefited from the civil unrest that started as a result of the fight for diamonds. For example, the agreement between Executive Outcomes and the Government of Sierra Leone, diamonds in exchange for protection, reached in December 1995 was valued at US \$15.9 million. According to Douglas, it was the involvement of such private military companies as Executive Outcomes and Sand Line International that raised considerable public interest about the war in Sierra Leone in Britain and South Africa.

Collier and Hoefflert (1998) investigate whether civil wars have economic causes. Using Probit and Tobit models, they empirically tested the proposition that rebels will conduct a civil war if the perceived benefits outweigh the costs of rebellion for a sample of countries which included Sierra Leone. The study revealed that the probability of civil wars increased with an increase in the mining of diamonds. Lujala, Gleditsch and Gilmore (2005) analyse the relationship between diamonds and armed conflict incidence and found a strong bivariate relationship between diamonds and the inception of civil war. The authors also stressed that even though secondary diamonds are positively related to the incidence of civil war, the discovery of diamond deposits in a country does not automatically result in civil war. Studies such as that of Smillie (2002) and Smillie, Gberie, and Hazleton (2000) point out that diamonds are dangerous only after commencement of production. A notable case is Sierra Leone with its blood diamonds. Olsson (2006) also analyses the linkages between the production of rough diamonds and economic development on a macro and micro level. According to the research, 'alluvial' mining is more strongly associated with negative externalities than 'kimberlite' mining. In Sierra Leone's case, most of the mining pre-conflict was 'alluvial'.

Resources, Inequality and Grievance:

Inequality has also been highlighted as one of the causes of the resource curse in Sierra Leone. Engerman and Sokoloff (1997; 2000) hypothesised that resource endowments predict the middle class share of income which in turn predicts development. Easterly (2002) argued that the conflicting results in the resource- growth literature was because many studies failed to account for the impact of inequality and long-run economic development and confirmed the Engerman and Sokoloff (1997; 2000) hypothesis. The paper revealed that, in Sierra Leone, in spite of the abundant endowment of diamonds and other resources, the middle sixty percent of the population received only 33.7 % of total income (close to the lowest in the world), hence the poor long term economic performance. According to

Conteh-Morgan and Dixon- Fyle (1999), the political elite often conspired with the economic elites of the Krio (descendants of freed slaves in Freetown, the Capital City) and the Lebanese (also in Freetown) to retain access to commodity rents although chiefs and big traders in the provinces began to share in the rents in the 20th century. Similarly, Gylfason and Zoega (2002) demonstrate how increased dependence on natural resources tends to result in less rapid economic growth and greater inequality in income distribution across countries. In the sample, Sierra Leone had the highest Gini coefficient and the research revealed that when the distribution of ownership of natural resources was more unequal than the distribution of other forms of wealth, the inequality of the distribution of income was directly related to the share of natural resources in national income.

Inequality leads to grievance. Using the “medium-N” method, Ross (2003) analyses the causal mechanisms surrounding the resource-conflict link in resource rich countries. He found that in the case of Sierra Leone, there was evidence of a grievance-based conflict: Revolutionary United Front rebels complained about resource exploitation, railing against “the raping of the countryside to feed the greed and caprice of the Freetown elite and their masters abroad” (cited in Richards, 1996). It is noteworthy that the grievances exploited by the rebel group concerned the distribution of resource wealth.

Resources and the Quality of Institutions:

A few of the studies highlighting the role of the quality of institutions on the growth impact of resources include that by Mehlum, Moene and Torvik (2006). This study examined a dataset that included Sierra Leone and confirmed the hypothesis that institutions are decisive for the resource curse. Their results, in contrast to the claims of Sachs and Warner that institutions do not play a role, revealed that natural resource- abundant economies tend to grow slower than economies without substantial resources because of the poor quality of their institutions. Studies such as those conducted by Boschini, Pettersson and Jesper (2003) and van der Ploeg (2010) survey a range of hypotheses and supporting evidence as to why some countries benefit and others lose from the presence of natural resources. In their panel studies, among which Sierra Leone featured in the data set, they found that resource booms support rent grabbing and civil conflict especially where there are poor quality institutions and high levels of corruption. Murshed (2002) and Olsson and Fors (2004) also suggest that ‘Weak institutions’ provide some explanation for the poor growth experience of oil-rich states such as Angola, Nigeria, Sudan and Venezuela and diamond rich states like Sierra Leone, Liberia and Congo.

In a bid to prevent repetition, at this point in this thesis, the review of the debt overhang and growth link which has already been carried out in the first empirical study, will not be repeated. However, it is worth noting that in most of the studies, Sierra Leone often features as part of a dataset. This is especially the case in datasets made up of heavily indebted countries, developing countries, low income countries

or Sub-Saharan African countries. Therefore, the conclusions reached in these studies, in general terms, do apply to Sierra Leone. The most significant finding related to this thesis is that debt stock and debt overhang are detrimental to economic growth. To the author's knowledge, there are hardly any studies exploring the debt overhang-resource curse hypothesis specifically for the case of Sierra Leone.

Given the few Sierra Leone specific studies available, there is essentially a wide gap in the literature regarding the impact of natural resources and debt on growth in Sierra Leone, and also which transmission mechanisms exhibit the strongest impact. The findings of the second empirical investigation will complement the already existing studies and contribute their own quota towards this discussion by empirically testing the debt overhang- resource curse hypothesis whilst at the same time testing and comparing the conflict, human capital, financial development and institutional explanations of the lagging growth experienced by resource rich Sierra Leone. It will also go a step further by investigating long term relationships between key economic variables and direction of causality in these relationships.

4.3 METHODOLOGY

The time series analysis of the debt overhang- resource curse hypothesis in Sierra Leone commenced with a brief description of the theoretical framework. The model that would be estimated was developed. The model was modified to capture the effect the quality of institutions and the political economy have on resource led growth in Sierra Leone. The empirical analysis continued with cointegration analysis to examine potential long run relationships. Finally Granger causality investigation was done to determine the direction of causality between variables where long term relationships were found to exist.

4.3.1 THEORETICAL FRAMEWORK AND THE MODEL

As explained earlier, this chapter investigates the possible debt-overhang effect of resources in Sierra Leone. The intuition provided by Chenery and Stout (1966) Two-Gap model is also applicable in the case of Sierra Leone. Thus, in this time series analysis, the theoretical framework described in Chapter Three, section 3.1 is applied. Equations (1.1), (2.1), (3.1), developed in section 3.2 provide the foundation for the model that would be estimated. Since this chapter carries out only a single- country analysis compared to the 153-country analysis done in the previous chapter, a system GMM is not estimated. A structural vector autoregressive model is instead estimated utilizing the same theoretical framework. The theoretical framework provides the basis for the restrictions placed to 'identify' the

structure of the VAR. Given some special characteristics of Sierra Leone, in addition to the explanatory variables included in the standard growth model, a few variables that are supported by economic theory are included in the model. These variables were not included in the model estimated for the panel due to lack of complete data. A military expenditure variable and a policy variable are incorporated to account for the role of political unrest and quality of institutions. Therefore, for the case of Sierra Leone, the baseline linear equations are:

Output Equation:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_3 DS_{t-1} + \alpha_4 CI_t + \alpha_5 S_t + \alpha_6 SDS_t + \alpha_7 HC_t + \alpha_8 MEXP_t + \alpha_9 POL_t + \alpha_{10} EXD_t + \varepsilon_1 \quad (4.0)$$

Where: Y_{t-1} is lagged output growth, DS_t is debt service, CI_t is capital inflows, S_t is natural resources, HC_t is human capital, $MEXP_t$ military expenditure, POL_t is policy and EXD_t is external debt stock.

Debt Equation:

$$DS_t = \beta_0 + \beta_1 Y_t + \beta_2 D_t + \beta_3 EXD_{t-1} + \beta_4 S_t + \beta_5 ER_t + \beta_6 DS_{t-1} + \beta_7 FB_t + \beta_8 CI_t + \beta_9 HIPC_t + \beta_{10} SA_t + \varepsilon_2 \quad (5.0)$$

Where: - FB_t is fiscal balance and $HIPC_t$ is debt forgiveness,

Capital inflow equation:

$$CI_t = \sigma_0 + \sigma_1 CI_{t-1} + \sigma_2 Y_t + \sigma_3 DS_t + \sigma_4 S_t + \sigma_7 SA_t + \sigma_8 EXD_t + \varepsilon_3 \quad (6.0)$$

However, as explained as earlier, the investigation in the case of Sierra Leone would be carried out within the VAR framework. Specifically, this thesis utilises the structural vector autoregressive (SVAR) methodology, formalized by Sims (1980). This methodology is compatible with the underlying economic theories, can account for endogenous relationships, and can summarise the empirical relationships without placing too many restrictions on the data. The VAR framework also eliminates the problem of endogeneity. The examination of the three equations that would be converted to a SVAR system reveals that the final system would be large. The large SVAR system such as the one that would be estimated in this thesis have been used before. For example, the 11-variable model in Dungey and Pagan (2000). Such larger SVARs, allow for richer interactions and a more parsimonious model with more degrees of freedom is likely to be easier to be more stable. Hence the reduced-form SVAR system to be estimated for the case of Sierra Leone is:

$$\theta_t = \alpha_t X_t + \beta_1 \theta_{t-1} + \beta_2 \theta_{t-2} + \delta_1 \Gamma_{t-1} + \delta_2 \Gamma_{t-2} + \varepsilon_{1t} + \dots + \alpha_p X_p + \beta_p \theta_{t-p} + \delta_p \Gamma_{t-p} + \delta_p \Gamma_{t-p} + \varepsilon_{1p} \quad (7.0)$$

Where θ is a vector of: Y_t, DS_t, CI_t ; Γ is a vector of lags of : $Y_t, DS_t, CI_t, S_t, SDS_t, HC_t, MEXP_t, POL_t, EXD_t, FB_t, HIPC_t$ and SA_t . This order of variables is maintained throughout the analysis. X_t is a vector of deterministic variables: constant and a dummy variable. The dummy variable accounts for political unrest. It takes the value of 1 in years of civil unrest and non-democratic rule and the value 0 otherwise. ε_t is white noise.

4.3.2 DATA DESCRIPTION AND VARIABLES EXPECTED SIGNS

The analysis uses a time series data set for Sierra Leone between 1970 and 2011. The data was collected from several sources. The main source of data for all the variables is from the Global Development Finance Indicators and World Development Indicators (April, 2012 edition), the dataset published by the World Bank accessed from the Economic and Social Data Service but now incorporated into the UK Data Service. Some data is sourced from Statistics Sierra Leone and official national statistics published by the Bank of Sierra Leone and the Ministry of Finance.

In addition to the dummy variable, military expenditure is used as a proxy for conflict/non-democratic government in Sierra Leone. This study assumes that political stability is directly proportional with the level of military expenditure which in turn is directly proportional with growth. In times of stability, less is spent on military expenditure compared to periods of unrest and coup d'états. Several researchers, such as Romer, (1994), Leite and Weidmann, (1999) and Njikam (2008), have pointed out that the quality of institutions and policy have a strong influence on the potential impact of natural resources on economic growth. In this chapter, a policy variable as computed by the World Bank is therefore included to capture this link and its coefficient is expected to be either positive or negative, depending on the quality of the institutions and policies. All the other variables that were included in the GMM system in Chapter Three are still expected to maintain the signs already discussed in section 3.3.

4.3.3 MODEL ESTIMATION

The overall SVAR model presented in section 4.3.1 is estimated using Eviews 8. The model estimation commenced by giving thought to the times series characteristics of the variables under consideration. In the literature on VARs, some econometricians have argued that time series being either stationary or non-stationary is mostly irrelevant for VAR modelling. Some argue that studies are allowed to use a

levels VAR in any case. Sims et. al. (1990) argue that by “differencing or de-trending a lot of information is lost.....and we may be interested in the inter-relationships between variables, not the coefficients themselves”. This thesis therefore follows the existing literature which typically estimates VARs in levels even when the variables are I (1). By doing the analysis in levels, we allow for implicit cointegration relationships in the data, and still have consistent estimates of the parameters (Sims et. al., 1990). The residuals of the estimation will also be stationary because of the inclusion of lagged levels of the variables in the VAR. In order to avert the possibility of spurious relationships between the I(1) variables, the relationships summarised by the SVAR are supported by economic theory.

A general SVAR system with three lags is first estimated. It was this study’s plan to estimate a model with more lags. However, complete quarterly data for all the variables of interest for Sierra Leone between 1970 and 2011 is unavailable. To determine the optimum number of lags that should be included, the general model was tested using three lag selection criteria: Akaike’s criterion function (AIC), Akaike (1973, 1974), Schwarz’s criterion (BIC), Schwarz (1978) and the likelihood ratio (LR) test. The model estimated with two lags, minimises both the AIC and BIC criteria and was therefore selected as the parsimonious model to be estimated for Sierra Leone.

In order to convert Equation (7.0) into the model defined by Equations (4.0), Equation (5.0) and Equation (6.0), the structural model must be identified. This is done by transforming the residuals from the vector autoregression, e_t , by imposing certain restrictions on contemporaneous relationships as supported by economic theory. It is clear, that twelve short run restrictions are necessary. The restrictions imposed imply the following:

$$\xi_{1t} = C(1) * @u1 \quad (8.0)$$

$$\xi_{2t} = -C(2) * \xi_{1t} + C(3) * @u2 \quad (8.1)$$

$$\xi_{3t} = C(4) * \xi_{1t} - C(5) * \xi_{2t} + C(6) * @u3 \quad (8.2)$$

$$\xi_{4t} = C(7) * \xi_{1t} - C(8) * \xi_{2t} + C(9) * \xi_{3t} + C(10) * @u4 \quad (8.3)$$

$$\xi_{5t} = -C(11) * \xi_{1t} + C(12) * \xi_{2t} - C(13) * \xi_{3t} + C(14) * \xi_{4t} + C(15) * @u5 \quad (8.4)$$

$$\xi_{6t} = -C(16) * \xi_{1t} - C(17) * \xi_{2t} - C(18) * \xi_{3t} - C(19) * \xi_{4t} + C(20) * \xi_{5t} + C(21) * @u6 \quad (8.5)$$

$$\xi_{7t} = C(22) * \xi_{1t} + C(23) * \xi_{2t} + C(24) * \xi_{3t} + C(25) * \xi_{4t} + C(26) * \xi_{5t} + C(27) * \xi_{6t} + C(28) * @u7 \quad (8.6)$$

$$\xi_{8t} = -C(29) * \xi_{1t} + C(30) * \xi_{2t} - C(31) * \xi_{3t} - C(32) * \xi_{4t} + C(33) * \xi_{5t} + C(34) * \xi_{6t} + C(35) * \xi_{7t} + C(36) * @u8 \quad (8.7)$$

$$\xi_{9t} = C(37) * \xi_{1t} - C(38) * \xi_{2t} + C(39) * \xi_{3t} + C(40) * \xi_{4t} - C(41) * \xi_{5t} - C(42) * \xi_{6t} + C(43) * \xi_{7t} - C(44) * \xi_{8t} + C(45) * @u9 \quad (8.9)$$

$$\xi_{10t} = C(46) * \xi_{1t} - C(47) * \xi_{2t} + C(48) * \xi_{3t} + C(49) * \xi_{4t} + C(50) * \xi_{5t} - C(51) * \xi_{6t} + C(52) * \xi_{7t} + C(53) * \xi_{8t} - C(54) * \xi_{9t} + C(55) * @u10 \quad (8.10)$$

$$\xi_{11t} = C(56) * \xi_{1t} + C(57) * \xi_{2t} + C(58) * \xi_{3t} + C(59) * \xi_{4t} + C(60) * \xi_{5t} + C(61) * \xi_{6t} + C(62) * \xi_{7t} + C(63) * \xi_{8t} + C(64) * \xi_{9t} + C(65) * \xi_{10t} + C(66) * @u11 \quad (8.11)$$

$$\xi_{12t} = C(67) * \xi_{1t} + C(68) * \xi_{2t} + C(69) * \xi_{3t} + C(70) * \xi_{4t} + C(71) * \xi_{5t} + C(72) * \xi_{6t} + C(73) * \xi_{7t} + C(74) * \xi_{8t} + C(75) * \xi_{9t} + C(76) * \xi_{10t} + C(77) * \xi_{11t} + C(78) * @u12 \quad (8.12)$$

Where: ξ_{1t} represents Y_t residuals, ξ_{2t} represents DS_t residuals, ξ_{3t} represents CI_t residuals, ξ_{4t} represents S_t residuals, ξ_{5t} represents SDS_t residuals, ξ_{6t} represents HC_t residuals, ξ_{7t} represents $MEXP_t$ residuals, ξ_{8t} represents POL_t residuals, ξ_{9t} represents EXD_t residuals, ξ_{10t} represents FB_t residuals, ξ_{11t} represents $HIPC_t$ residuals, ξ_{12t} represents SA_t residuals and $E[u\acute{u}]=1$.

The properly identified structural form VAR is thus estimated using ordinary least squares. Inference regarding the debt overhang- resource curse impact on economic growth in Sierra Leone is made from the impulse response functions and variance decomposition of GDP. The results are presented in Table 2.2 and Table 2.3.

SVARs can be quite sensitive to the assumptions used in their estimation especially changes to number of lags, Stock and Watson (1996, 2001). In order to assess the stability of the SVAR, the AR root test was done. The estimated VAR is stable (stationary) if all roots have modulus less than one and lie inside the unit circle. If the VAR is not stable, certain results (such as impulse response standard errors) are not valid. The residuals of the estimation were also tested for serial autocorrelation. The results presented in the Appendix confirms that there is no serial correlation up to lag 3.

Table 2.1: Results of the Autoregressive Root Test

Root	Modulus
0.879774 - 0.061554i	0.881924
0.879774 + 0.061554i	0.881924
0.797505 - 0.144455i	0.810482
0.797505 + 0.144455i	0.810482
0.563885 - 0.553874i	0.790407
0.563885 + 0.553874i	0.790407
0.286019	0.286019
-0.044502 - 0.068129i	0.081375
-0.044502 + 0.068129i	0.081375
-9.92e-14	9.92E-14
No root lies outside the unit circle. VAR satisfies the stability condition.	

The results in Table 2.1 confirm that the SVAR estimated is stable and estimates are robust. This thesis thus proceeds by testing how economic growth in Sierra Leone responds to certain impulses. Impulse responses provide a useful summary of the relationships implied by the large number of estimated coefficients in the SVAR. The impulse response analysis is followed by an evaluation of the variance decomposition of growth.

4.4 THE RESULTS OF STRUCTURAL VECTOR AUTOREGRESSIVE MODEL FOR SIERRA LEONE, 1970 to 2011.

The main objective of this SVAR analysis is to test the debt-overhang resource curse hypothesis for the case of Sierra Leone. The first part of this analysis therefore focuses on how GDP responds to the impulses, in this case, debt service, capital inflows, natural resource rents, debt-overhang, military expenditure, policy, external debt stocks, fiscal balance, debt relief, domestic savings and the conflict dummy. The analysis then proceeds by evaluating variance decompositions of GDP and SDS.

4.4.1 IMPULSE RESPONSE FUNCTIONS

The impulse-response functions represent the short-run dynamics between GDP each of the other endogenous variables in response to all identified structural shocks. These impulse functions trace the

effect of a one-time shock to GDP on current and future values of the variable. In Figure 1.0, the responses of GDP to the named impulses are summarised.

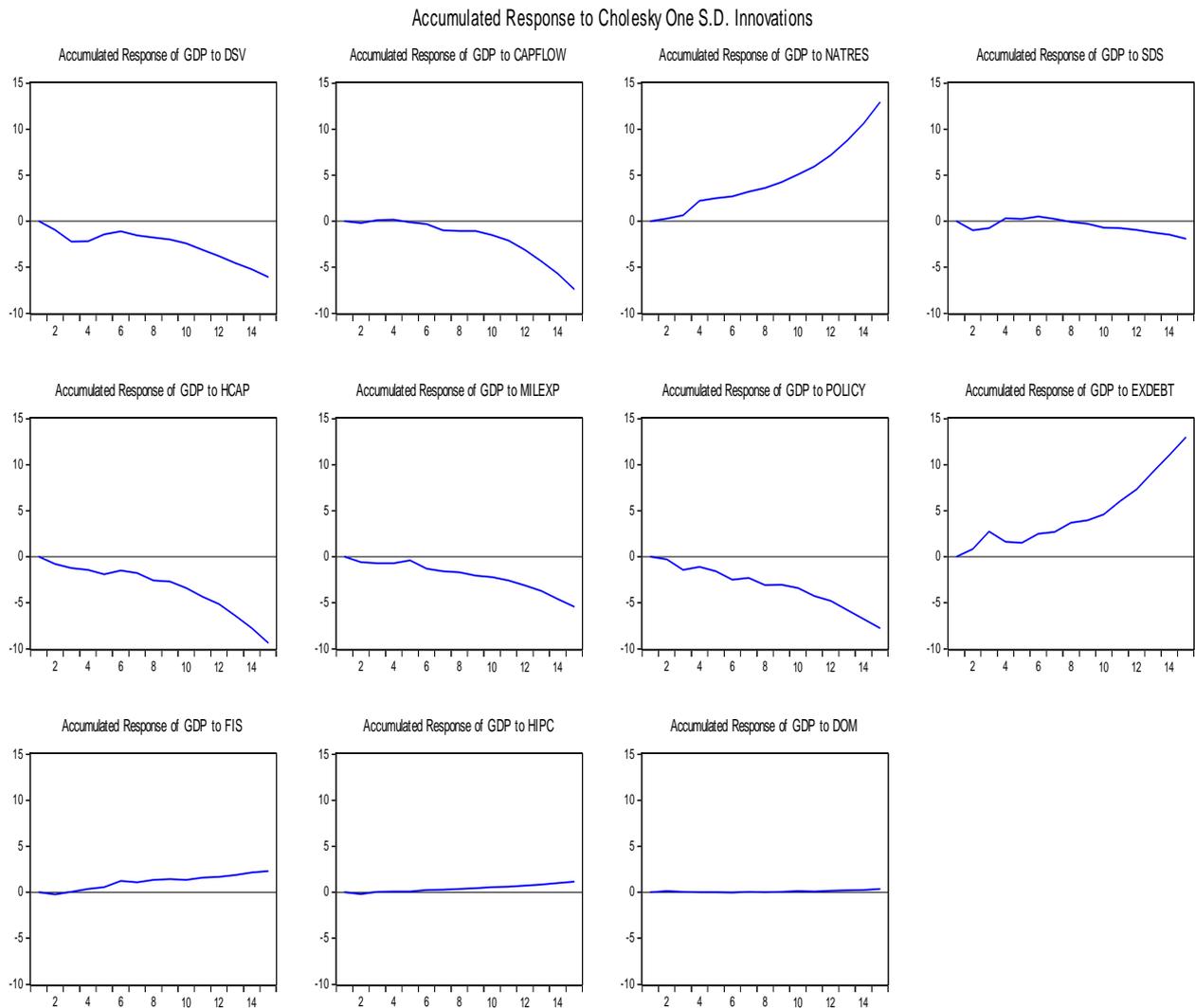


Figure 1.0: GDP Accumulated Responses to Impulses (Author’s calculations in Eviews 8)

The impulse responses of GDP in Sierra Leone for the period under review derived from the SVAR estimation. Figure 1.0 shows the accumulated response of GDP to one standard deviation of debt service, capital inflows, natural resource rents, debt-overhang, human capital, military expenditure, policy, external debt stocks, fiscal balance, debt forgiveness and domestic savings over a 15 year period. 15 years is long enough for shocks to impact significantly on GDP.

It is clear from Figure 1.0 that GDP responds positively to changes in natural resource rents. From the initial response in the first year, GDP continues to grow steadily as the years go by. This is similar to

the results of the LDC, OPEC, Mineral-rich and Petroleum-rich sub-panels estimated in Chapter Three. In all those panels, natural resource rents exhibited a positive significant impact on growth. It is worth noting that Sierra Leone is not only an LDC but also a mineral-rich country.

GDP in Sierra Leone responds negatively to one standard deviation change in debt servicing. Figure 1.0 illustrates a steady decline in GDP after the first six years. This negative relationship between GDP growth and debt servicing was also found in the negative significant impact debt service exhibited on GDP growth in the OECD, LDC, Mineral -rich, Petroleum-rich and SSA sub-panels estimated by GMM in Chapter Three. Cohen and Sachs (1986) explained that debt servicing is an equilibrium strategy employed by countries to avoid debt repudiation. Sierra Leone is one of the SSA countries.

Sierra Leone's GDP between 1970 and 2011 grows steadily with external debt stocks. This positive relationship, in this study's opinion has underpinnings in how GDP is measured. It is worth noting that Debt service in Sierra Leone responds positively to changes in external debt, growing steadily after the first five years (see Figure 2.0). A similar significant positive link between external debt stocks and debt service was also found in the results of the GMM estimation for the whole panel of 153 countries, HICPs, LDCs, OPECs, Mineral-rich countries, Petroleum-rich countries and SSAs.

From Figure 2.0, in response to the a change in the interactive variable (SDS), GDP initially falls then rises slightly in the fourth year and then falls steadily after the eighth year. This provides support for the debt-overhang resource-curse hypothesis. The relationship between GDP and this debt-overhang resource-curse variable was also significantly negative in the LDC, Mineral -rich, Petroleum -rich and SSA sub-panels.

When one analyses the interaction of natural resource rents, GDP, external debt stocks and debt servicing, it is clear that despite the positive response of GDP to natural resource rents and external debt stocks, GDP still has a negative response to debt servicing and the interactive variable. It is interactions such as these that the simultaneous estimation of the equations in the GMM system in Chapter Three also estimate. This provides further justification of the methodology given the dynamic nature of the economy.

It has been suggested that natural resources provide both reason and opportunity for conflict (Collier and Hoeffler, 2000; Acemoglu et al. 2001; Stevens, 2003; Ross, 2004; Lujala, Gleditsch, and Gilmore, 2005). It has been explained in section 4.3.2 that in this study, military expenditure is assumed to increase with the likelihood of conflict or political instability. The results of the SVAR estimation for Sierra Leone indicate a steady decline in GDP to shocks in military expenditure. This sanctions that

conflict and political instability adversely affect GDP growth in Sierra Leone thus confirming the conflict theory of the resource curse.

Researchers like Krueger et. al. (1992), Torvik, (2002), Brollo (2010), Acemogul et al. (2002) and Juel and Ross (2011) provided the Institutional quality theory of the resource curse. They explained that differences between successful and unsuccessful resource rich countries lie in the quality of their institutions. The results presented in Figure 1.0 reveal a negative relationship between policy and growth in Sierra Leone. This finding indicates that the quality of institutions in Sierra Leone is poor. This finding is as a result of the high level of corruption and poor accountability in Sierra Leone.

In the resource curse literature, when production is concentrated on resource extraction, it is assumed to crowd out the development of human capital leading to reduced growth. This is evident in the negative reponse of GDP to a shock on human capital in Sierra Leone. Studies such as Wood and Mayer (1998), Stijns (2006) and Bravo-Ortega and de Gregorio (2007) have explained that it is the stock of human capital available rather than resource abundance that is the main determinant of a country's growth potential. Sachs and Warner (1995) and Gylfason, et al. (1999) indicated that exporting natural resources reduces employment in the traded sector, impeding 'learning by doing' and eventually restricting economic growth. This response of growth to a human capital impulse in Sierra Leone validates these studies and provides support for the Human Capital Theory of the resource curse.

To the author's surprise, even though Sierra Leone is a HIPC, the Sierra Leone results contrast with that of the HIPC panel presented in section 3.6.2. Figure 1.0 shows that GDP rises slowly but steadily with a one standard deviation change in debt relief. It is also due to the fact that aid inflows played an important role in complementing government revenue. This is the result that was also expected for the HIPC panel but failed to materialise. This contradictory result is based on the fact that, in order to qualify for debt relief, the countries must meet certain criteria set out by the IMF and World Bank. The amount of debt relief and additional conditionalities set are country specific. These conflicting findings strengthen the case for country specific studies for greater policy alignment.

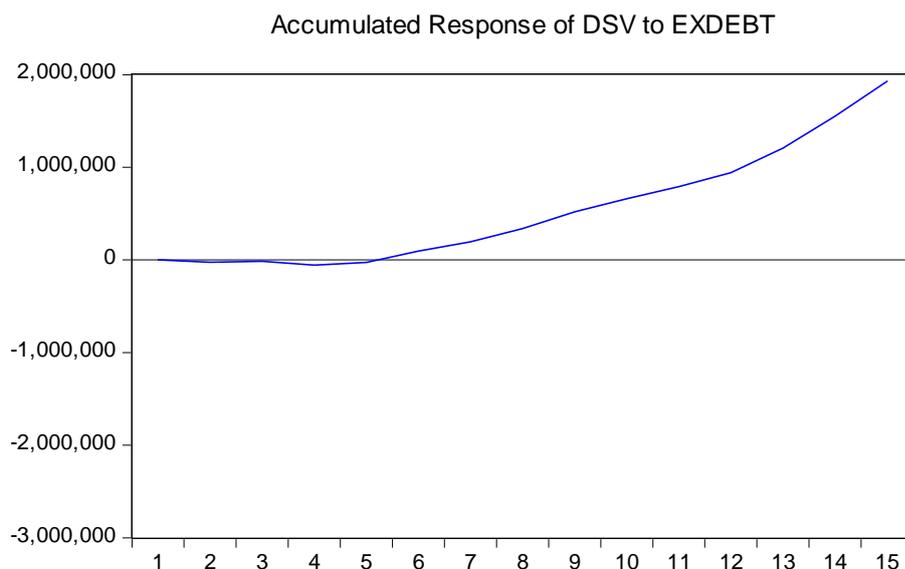


Figure 2.0: Accumulated Response of Debt Service to External Debt Stock (Author’s Calculations in Eviews 8)

The results of the SVAR model estimation provide strong support for the debt overhang- resource curse hypothesis in Sierra Leone thus accepting the debt overhang- resource curse hypothesis and supporting Manzano and Rigobon (2001). Manzano and Rigobon (2001) explained that countries borrow with their natural resources as collateral and when the commodity prices fall, some struggle to repay debts, hence, the debt overhang resource curse hypothesis. It also complements both the ‘Quality of Institutions’ theory and the ‘Conflict’ theory of the resource curse in the review of the literature in Chapter Two. The positive effects of the resource endowment in Sierra Leone are netted out by the adverse effects of external debt and poor institutional quality. Collier and Goderis (2007) reached a similar conclusion. On this basis, this research concludes that, for the case of Sierra Leone, there is evidence of a debt overhang –resource curse. Sierra Leone’s past has also been marred by civil conflict, coup d’états and high levels of corruption. The country has been stable since the official end of the war in 2002, has successfully elected a democratic regime and measures to curb corruption, especially in public offices, have been put in place. It is fair to say that these are steps in the right direction, as studies such as Lane and Tornell, (1996), Torvik (2002) and (Auty, 2007) have stressed that political stability, democracy and low corruption prevents the potential resource curse.

4.4.2 VARIANCE DECOMPOSITION

Variance decomposition represents the contribution of each shock to the variability in each endogenous variable. Given the main research question, the variance decomposition analysis concentrates on GDP and the interactive variable (SDS). Table 2.2 and Table 2.3 illustrate the percentage contribution of each shock to the variance in GDP and SDS over a fifteen year period respectively.

The results from Table 2.2 indicate that GDP explains most of the variation in itself. Its share in the variation however decreases from year to year. From year 3, the debt overhang- resource curse variable explains most of the variation in GDP. The bulk of the remainder of the variation is explained by debt service, external debt, capital inflows and policy. The share of capital inflows increases significantly from the eleventh year. This confirms that filling the external gap by either borrowing and / or attracting foreign investment or the policies implemented to manage the economy are significant determinants of GDP growth in Sierra Leone.

Table 2.2: Variance Decomposition of GDP in Sierra Leone, 1970-2011

Period	GDP	DSV	CAPFLOW	NATRES	SDS	HCAP	MILEXP	POLICY	EXDEBT	FIS	HIPC	DOM
1	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	74.22	5.85	0.88	0.00	4.51	0.48	2.37	0.56	6.11	4.20	0.70	0.13
3	60.86	8.81	0.49	0.47	15.46	0.52	1.33	4.95	3.47	2.91	0.23	0.50
4	52.82	7.23	7.31	0.79	16.39	0.72	1.09	4.37	6.37	2.52	0.30	0.09
5	51.48	8.35	0.61	7.73	15.62	0.78	1.31	4.76	6.09	2.94	0.25	0.08
6	47.33	7.78	0.85	7.35	16.05	1.85	3.28	6.42	5.51	3.04	0.36	0.18
7	47.01	7.79	1.64	6.91	15.92	1.82	3.32	6.21	5.65	3.09	0.54	0.10
8	44.22	7.45	1.56	7.20	17.15	1.85	3.15	7.28	5.51	4.28	0.26	0.10
9	43.41	7.45	2.54	7.14	17.03	1.84	3.33	7.16	5.53	4.24	0.25	0.10
10	41.95	7.37	1.87	7.93	16.94	1.73	3.19	7.01	5.58	5.11	1.21	0.10
11	38.04	7.52	9.33	4.99	19.01	6.10	3.11	7.58	2.28	1.65	0.25	0.08
12	35.26	7.42	10.69	4.50	19.55	6.52	3.24	7.17	3.81	1.48	0.24	0.08
13	31.68	6.87	12.19	3.81	20.73	7.52	3.19	7.25	5.16	1.27	0.21	0.07
14	28.32	6.28	14.13	3.25	21.27	8.35	3.49	7.16	6.28	1.13	0.21	0.06
15	25.35	5.78	16.53	2.86	20.90	9.16	3.54	6.82	7.79	0.96	0.19	0.06
Cholesky Ordering: GDP DSV CAPFLOW NATRES SDS HCAP MILEXP POLICY EXDEBT FIS HIPC DOM												

GDP and Debt servicing accounts for most of the variation in SDS as seen in Table 2.3. Their share however gradually decline over the years. On the other hand, the share of the variance in SDS explained by natural resource rents gradually increases. This confirms the debt overhang –resource curse hypothesis in the long run. As natural resource rents increase, resource abundant countries borrow more, against the future resource revenue, leading to greater debt servicing requirements. As debt servicing increases, the share of SDS explained by debt forgiveness (the HIPC variable) increases. This is because the country is undergoing certain poverty reduction programs with its key creditors, especially the International Monetary fund, most of the loans are concessional loans, and the country has also qualified for debt relief under the HIPC Initiative

Table 2.3: Variance Decomposition of Debt Overhang-Resource Curse Variable (SDS) in Sierra Leone, 1970-2011

Period	GDP	DSV	CAPFLOW	NATRES	SDS	HCAP	MILEXP	POLICY	EXDEBT	FIS	HIPC	DOM
1	81.550	17.899	0.05	0.18	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	61.81	17.55	1.07	0.10	2.62	0.16	15.2	0.12	0.58	0.37	0.04	0.25
3	51.55	17.01	4.73	1.11	4.07	0.75	16.10	0.18	0.56	3.32	0.31	0.24
4	54.78	13.06	4.29	2.36	3.57	0.50	14.27	1.58	2.27	2.35	0.72	0.21
5	49.56	11.33	3.76	4.19	9.52	1.21	11.01	4.68	1.72	2.21	0.58	0.16
6	44.80	10.18	5.26	4.06	9.93	1.65	11.24	4.16	5.75	2.06	0.72	0.15
7	37.45	10.49	11.42	4.48	8.36	4.20	9.81	3.53	7.17	2.28	0.60	0.14
8	29.39	8.889	20.56	4.36	6.56	6.44	7.70	3.05	10.04	2.28	0.55	0.12
9	24.09	7.467	25.44	5.38	5.41	5.85	7.00	2.71	14.08	1.89	0.52	0.09
10	21.14	6.333	28.91	6.84	5.06	6.41	6.69	2.30	13.94	1.80	0.44	0.09
12	7.81	16.7867	4.967	34.87	8.36	4.85	7.94	5.71	1.82	12.52	1.70	0.37
13	8.61	14.01	4.20	37.92	7.40	5.36	7.70	5.18	1.53	14.61	1.61	0.34
14	9.41	11.14	3.77	39.62	6.37	5.47	7.90	4.85	1.22	17.74	1.53	0.28
15	10.36	8.94	3.45	40.92	6.27	4.99	8.53	4.68	0.97	19.48	1.45	0.22
12	7.812	16.78	4.96	34.87	8.36	4.85	7.94	5.71	1.82	12.52	1.70	0.37
Cholesky Ordering: GDP DSV CAPFLOW NATRES SDS HCAP MILEXP POLICY EXDEBT FIS HIPC DOM												

Thirlwall (1978) explained that, traditionally, the role of foreign borrowing is to supplement domestic saving. This is true for Sierra Leone as exhibited by the really small percentage of SDS variation explained by domestic savings. This clearly shows evidence of inadequate domestic saving. This clearly shows that Sierra Leone is in that stage of its development wherein it still needs to borrow to fill the foreign exchange gap explained by Chenery and Stout's Two Gap model. Low levels of domestic savings, means low levels of domestic borrowing and lending shedding light on the underdevelopment of Sierra Leone's financial market and the widening informal money market. The country, however, has access to the international money market and capital inflows account for varying percentages of the variance in SDS.

The SVAR estimated for Sierra Leone was identified by imposing short run restrictions on the residuals of the endogenous variables. The investigation of the debt overhang-resource curse hypothesis continues by examining the long run relationships between the main variables. There has been a surge in resource extraction in Sierra Leone. The discovery of rumoured commercially viable oil deposits has paved the way for greater resource extraction over the coming years. Deaton and Miller (1995) argue that vector autoregressive models cannot account for the long term impact of resource endowments. The possibility of short run positive effects being offset by long run effects outside the horizon of VAR models thus exists. In this light, it was important to examine the nature of the long run relationships between certain key variables and the direction of causality running between them. This has severe implications on policy formulation, governance and investment negotiations. This study, therefore, carried out cointegration tests (Engle-Granger and Johansen). For pairs of variables where a long run cointegration relationship was confirmed by both tests, a test for causality was applied. The results of the cointegration and causality tests are presented in Table 2.5 and Table 2.6 respectively.

4.4.3 THE UNIT ROOT TEST

The first step to cointegration analysis is an evaluation of the stationarity of the variables. This study therefore proceeds with the debt overhang-resource investigation for Sierra Leone by carrying out unit root tests given the time series nature of the data. The tests reveal whether all the variables are individually stationary. The Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) test were used to test for stationarity. In testing for stationarity, graphs of the time series were first examined to determine whether the test should be done with an intercept, or trend or with both. The results of the ADF test were confirmed by the PP test. The results for both tests are shown in Table 2.4.

From the results of the tests reported in Table 2.4, Debt Service, Human Capital, and Debt Forgiveness are shown to be stationary at levels, that is, $I(0)$. Domestic savings, External debt, Gross Domestic

Product, Fiscal Balance, Capital inflows, Natural Resources, Policy , Military Expenditure and Debt overhang are integrated of order one, I(1).

Table 2.4: Time Series Unit Root Test Results

Variables	ADF Test Statistic	Critical values at 5%	*Probabilities of ADF- Test	Order of Integration	Phillips-Peron statistic	Critical values at 5%	**Probabilities of PP test	Order of Integration
GDP	-7.507903	-1.9498	0.0000	I(1)	-8.958418	-2.938987	0.0000	I(1)
DSV	-3.016791	-2.9369	0.0418	I(0)	-2.698549	-1.949319	0.0082	I(0)
CAPFLOW	-6.071922	-2.9389	0.0000	I(1)	-6.015410	-1.949609	0.0040	I(1)
NATRES	-7.256443	-2.9389	0.0000	I(1)	-8.987215	-2.938987	0.0000	I(1)
SDS	-7.228546	-3.52975	0.0000	I(1)	-9.366689	-3.529758	0.0000	I(1)
HCAP	-3.093705	-2.9369	0.0315	I(0)	-3.156881	-2.936942	0.0030	I(0)
MILEXP	-8.493788	-2.9389	0.0000	I(1)	-8.269752	-2.938987	0.0000	I(1)
POLICY	-6.899401	-2.9389	0.0000	I(1)	-6.899401	-2.938987	0.0000	I(1)
EXTDEBT	-5.424069	-1.9496	0.0000	I(1)	-5.366899	-2.938987	0.0001	I(1)
FIS	-5.982386	-2.9411	0.0000	I(1)	-8.486796	-2.938987	0.0000	I(1)
HIPC	-5.005896	-2.9369	0.0002	I(0)	-5.012452	-2.936942	0.0002	I(0)
DOM	-4.8315	-2.9411	0.0003	I(1)	-3.147690	-1.949609	0.0024	I(1)
* Probabilities are MacKinnon (1996) one-sided p-values								

4.4.4 COINTEGRATION TESTS FOR SIERRA LEONE, 1970-2011 AND RESULTS

The Engle-Granger test, tests the null hypothesis: Series are not cointegrated. The probability values are derived from the MacKinnon (1996) response surface simulation results. All the relationships are evaluated at the 5% conventional level. The Johansen VAR-based cointegration test, tests the null hypothesis: No cointegration. The critical values reported for this test are MacKinnon-Haug- Michelis (1999) *p*-values, so they differ slightly from those reported in Johansen and Juselius (1990). From Monte Carlo experiments comparing the trace statistics and Eigen value from the Johansen cointegration, some researchers, including Toda (1994) and L autkepohl (2000), have shown that, even

though trace tests seem to have distorted sizes, their power is superior. This study, therefore, uses trace statistics to conduct inference from the results of the Johansen cointegration test.

TABLE 2.5: RESULTS OF COINTEGRATION TESTS

Variables	Engle-Granger Test			Johansen Test		
	tau-Statistic	P values	Reject Null? Y/N	λ -Trace Statistic	P values	Reject Null? Y/N
GDP AND EXTERNAL DEBT	-4.014380	0.0154	Y	18.48129	0.0172	Y
GDP AND MILITARY EXPENDITURE	-3.977738	0.0168	Y	16.34499	0.0372	Y
GDP AND CAPITAL FLOW	--4.080418	0.0132	Y	16.95955	0.0299	Y
GDP AND POLICY	-4.065121	0.0137	Y	18.39095	0.0178	Y
GDP AND NATURAL RESOURCES	-4.026163	0.0150	Y	18.22014	0.0190	Y
GDP AND DEBT OVERHANG	-3.361049	0.0479	Y	6.776648	0.0092	Y
NATURAL RESOURCES, CAPITAL FLOW	-3.474398	0.0525	Y	12.88142	0.2485	N
NATURAL RESOURCES AND EXTERNAL DEBT	-2.861887	0.1698	N	13.14557	0.1096	N
NATURAL RESOURCES AND POLICY	-2.869076	0.1677	N	12.11076	0.3009	N
NATURAL RESOURCES AND MILITARY EXPENDITURE	-2.853403	0.1722	Y	20.08504	0.0095	Y
NATURAL RESOURCES AND DEBT OVERHANG	-3.261259	0.0808	N	7.183070	0.3258	N

The results of the both cointegration tests, reveal that long term cointegration relationships exist between GDP and natural resources, GDP and external debt , GDP and military expenditure, GDP and policy, GDP and capital flow and between GDP and debt overhang . It is also evident that natural resources have a long run relationship with military expenditure, external debt, capital inflows, policy and debt overhang.

4.4.5 GRANGER CAUSALITY TEST IN SIERRA LEONE, 1970-2011 AND RESULTS

Cointegration means Granger causality in at least one direction. The Granger causality test seeks to examine how much of the present can be explained by past values (Granger, 1969). In the Granger-sense therefore, a time series x is a cause of y if it is useful in forecasting y . More precisely, variable X is said to Granger-cause another variable, Y , if the current value of Y (y_t) is conditional on the past values of X ($x_{t-1}, x_{t-2}, \dots, x_0$), thus the history of X is likely to help predict Y (Konya, 2004). It is important to not to think of causality in the common use of the term. “Granger cause” does not infer ‘is the effect of’ or ‘the result of’. It measures precedence and information content.

The results in Table 2.6 show that the past values of natural resource rent and GDP explain each other’s growth. Similarly, there is bi-directional causality between natural resources and military expenditure. This is essentially significant for conflict prevention, but also to prevent exploitation by security firms, as explained by Douglas (1998). Two-way causal relationships also exist between natural resources and debt overhang, GDP and capital inflow, GDP and Policy. Past values of GDP can explain current trends in military expenditure and debt overhang in Sierra Leone. This is shown by the uni-directional causality running from GDP to External Debt and GDP to Debt Overhang.

TABLE 2.6: RESULTS OF PAIRWISE GRANGER CAUSALITY TEST

Variables	Null Hypothesis	F-Statistic	Probability	Conclusion
NAT RES AND GDP	<i>NATRES does not Granger cause GDP</i>	0.86659	0.5178	Bi-directional causality between NATRES and GDP
	<i>GDP does not Granger cause NATRES</i>	0.89135	0.5024	
NATRES AND MILEXP	<i>NATRES does not Granger cause MILEXP</i>	1.40245	0.2589	Bi-directional causality between NATRES AND MILEXP
	<i>MILEXP does not Granger cause NATRES</i>	0.53625	0.7468	
NATRES AND EXDEBT	<i>NATRES does not Granger cause EXDEBT</i>	0.91032	0.4120	Bi-directional causality between NATRES AND EXDEBT
	<i>EXDEBT does not Granger cause NATRES</i>	0.19121	0.8268	
NATRES AND CAPFLOW	<i>NATRES does not Granger cause CAPFLOW</i>	0.54381	0.5855	Bi-directional causality between NATRES AND CAPFLOW
	<i>CAPFLOW does not Granger cause NATRES</i>	1.79834	0.1810	
NATRES AND POLICY	<i>NATRES does not Granger cause POLICY</i>	0.16443	0.8490	Bi-directional causality between NATRES AND POLICY
	<i>POLICY does not Granger cause NATRES</i>	0.12031	0.8870	
NATRES AND DEBT OVERHANG	<i>NATRES does not Granger cause DEBT OVERHANG</i>	0.02024	0.9800	Bi-directional causality between NATRES AND DEBT OVERHANG
	<i>DEBT OVERHANG does not Granger cause NATRES</i>	0.30629	0.7382	
GDP AND EXDEBT	<i>GDP does not Granger cause EXDEBT</i>	0.18370	0.9660	Uni-directional causality from GDP to EXDEBT
	<i>EXDEBT does not Granger cause GDP</i>	4.84519	0.0033	
GDP AND MILEXP	<i>GDP does not Granger cause MILEXP</i>	0.97299	0.4541	Uni-directional causality from GDP to MILEXP
	<i>MILEXP does not Granger cause GDP</i>	3.28559	0.0212	
GDP AND CAPFLOW	<i>GDP does not Granger cause CAPFLOW</i>	1.41545	0.2544	Bi-directional causality between GDP and CAPFLOW
	<i>CAPFLOW does not Granger cause GDP</i>	1.25979	0.3133	
GDP AND POLICY	<i>GDP does not Granger cause POLICY</i>	1.72572	0.1670	Bi-directional causality between GDP and Policy
	<i>POLICY does not Granger cause GDP</i>	1.24223	0.3206	
GDP AND DEBT OVERHANG	<i>GDP does not Granger cause DEBT OVERHANG</i>	1.35489	0.2716	Uni-directional causality from GDP to DEBT OVERHANG
	<i>DEBT OVERHANG does not Granger cause GDP</i>	3.01672	0.0622	

4.4.5 CONCLUSION

A structural vector autoregressive model was specified based on the theoretical framework developed in Chapter Three. The SVAR model was augmented with variables to capture the effect of the quality of institutions (policy variable), the political economy (military expenditure variable) and a conflict dummy. This augmented model improves on the original model developed in Chapter Three because it captures a wider scope of the resource –growth dynamics. This model was not estimated in Chapter Three, mainly because, in addition to data availability limitations, in the opinion of this research, a case –by-case analysis better captures the quality of institutions and political stability on resource led growth.

Results of the SVAR estimation confirm the debt overhang –resource curse hypothesis in Sierra Leone. It also highlights the fact that, based on historical data, resources have positive effect on growth in Sierra Leone but this positive effect is wiped out by the negative impact of debt overhang. Other significant theories that help explain Sierra Leone’s lagging growth are the quality of institutions theory, the human capital theory and the conflict theory.

The cointegration tests confirm that natural resources have a long term relationship with growth, external debt, capital inflow, policy, debt overhang and military expenditure. Therefore, resource rents are intertwined with many aspects of the Sierra Leonean economy. Growth also has long run relationships with external debt, military expenditure, policy, capital flow and debt overhang. The Granger causality test revealed bi-directional causality between natural resources and growth, but uni-directional causality running from growth to debt overhang. This confirms that the need for acquiring debt arises from shortfalls in domestic output and income.

CHAPTER FIVE

DEBT OVERHANG, NATURAL RESOURCES AND GROWTH IN SIERRA LEONE: A PERCEPTIONS AND DOCUMENTS ANALYSIS

5.0 INTRODUCTION

In the previous chapter, ‘Debt Overhang, Natural Resources and Growth: A Time Series Analysis of Sierra Leone’s Experience’, the results of the SVAR estimation provided strong support for the debt overhang- resource curse hypothesis in Sierra Leone. They further reinforced the ‘Quality of Institutions’ and the ‘Conflict’ theories of the resource curse leading to the conclusion that, for the case of Sierra Leone, resource extraction contributes to its growth underperformance to date. The model estimated was based on short term restrictions, prompting cointegration tests to establish long run relationships. The tests revealed long term co-integrating relationships between natural resources and GDP, natural resources and military expenditure, natural resources and capital inflows, natural resources and policy and natural resources and debt overhang. It is also evident that GDP has long run relationships with external debt, military expenditure, capital inflow, policy and GDP and debt overhang. It is evident that natural resource extraction has a long term relationship with economic growth and that long term relationships exist between GDP growth and many variables. GDP growth, the main estimate for economic growth, does not automatically translate into economic development, reduced inequality and improved standard of living. This has severe implications for policy formulation, governance and investment negotiations.

It is against this background that this chapter of this thesis seeks to go further than the purely quantitative model estimations in the two previous chapters. The findings and conclusion reached from the results of the estimations in Chapter Three and Chapter Four are based on mostly historical data. The mixed method analysis that will be done in this chapter will be based on more recent data, mainly current the perceptions of Sierra Leoneans regarding the relationship between the country’s natural resources, debt, growth and development. This chapter goes beyond economic growth to encompass development. Development entails how the positive effects of economic growth ‘trickle down’ to the masses and result in all round improvement of the standard of living and reduced poverty.

One key motivation is the fact that GDP measures do not often capture ‘welfare’. This research, like most development economists, believes that even though GDP is a good measure of economic growth, it is not entirely adequate in measuring economic development. This chapter of this thesis will also supplement

the findings of the second paper by bringing some ‘real life’ resonance to them. Given that conclusions drawn from purely quantitative studies utilising secondary data are often quite general, this research believes it is necessary to investigate whether the story told by the empirical estimation matches the real life experiences and perceptions of Sierra Leoneans. This examination will, therefore, use a mix of quantitative and qualitative approaches to provide a more close-up view of the relationship shared by natural resources, debt overhang, economic growth and economic development in Sierra Leone.

This chapter will examine the impact of resource extraction and external debt on standards of living, health, education, social amenities, labour relations, corporate social responsibility, wages, migration patterns, government spending, community initiatives, the environment and economic development as a whole, both at community level and national level, by measuring the experiences and perceptions of Sierra Leoneans and comparing how, together with government mining legislation and operations of mining companies, they explain the impact of natural resources and debt on current development in Sierra Leone. Development hereafter is taken to encompass economic growth, improved standard of living and alleviation of poverty.

Sierra Leone is well known for the exportation of diamonds. To the knowledge of the author, most studies related to the natural resource – growth/development link in Sierra Leone, activities related to mining of diamonds are the main constructs. Diamonds still contribute to growth in Sierra Leone and are still very much relevant. Post-conflict diamond mining in Sierra Leone is now mostly ‘kimberlite’ mining. Olsson’s (2006) analysis of the linkages between the production of rough diamonds and economic development on a macro and micro level revealed that ‘alluvial’ mining is more strongly associated with negative externalities than ‘kimberlite’ mining. In October 2000, in accordance with United Nations Security Council Resolution 1306 of July 5, 2000, Sierra Leone initiated a diamond certification scheme. On November 5, 2002, the scheme, known as the Kimberley Process Certification Scheme (KPCS), designed to stem the flow of conflict diamonds to international markets, was also adopted by Sierra Leone alongside the introduction of the Government Gold and Diamond Office. Apart from diamonds, most of Sierra Leone’s recent extractive activities are connected to the mining of iron ore, rutile and bauxite. This paper, therefore, concentrates on the activities surrounding the mining of these minerals and the impact on development in Sierra Leone.

According to the Sierra Leone’s Millennium Development Goals Report 2010, the country is experiencing an estimated incidence of poverty at 60 % and has moved 12 points upwards on the HDI (IMF, 2011). Notwithstanding, there has been a surge in the number of foreign firms operating in the extractive industry in Sierra Leone since the official end of the ten year civil conflict and, with the fragile economies of the west, more companies are turning to Africa for investment opportunities. The IMF forecasted Sierra Leone's GDP to grow by 34% in 2012, with two iron ore projects leading the way (Financial Times, 2012). There are very limited post-conflict academic studies investigating post-conflict

extractive activities outside the diamond mining arena in Sierra Leone and purely quantitative resource-economic growth studies, such as Ross (1999), Collier and Hoeffler (1998) and Easterly (2002), are often limited by purely historic secondary data. More often than not, there are differences between the numbers and actual life experiences, specifically on the welfare platform. According to Barber B. Conable, President of the World Bank in 1990, "quality of life must be measured institutionally and politically, as well as in material ways" (Conable, 1990). There is this gap in the literature on Sierra Leone's natural resource –development experience. This in-depth study of current trends would help to properly understand the multiplier effects the extractive activities of the firms, the Government and the indigenous people of Sierra Leone have on the country's development.

This chapter uses integrative logic to address these gaps using a convergent parallel mixed methods research design, as in Townsend, Floersch and Findling (2010). The analysis is made up of simple questionnaire data analysis using Microsoft Excel, structural equation models estimated using SMART PLS1 and documentary analysis of key mining agreements, Government of Sierra Leone legislation, company reports, newspaper articles, a few interviews and the researcher's observation of life in and out of the mining communities. From the analysis of the perceptions of Sierra Leoneans, natural resources do not currently lead to growth and development. Whilst the activities of mining companies have a positive but insignificant impact on development, the role of the government is paramount in ensuring resource rents benefit the country in terms of poverty reduction and standard of living improvement. There is also a lack of awareness of the country's debt servicing commitments.

In the next section of this chapter, the theoretical framework for this portion of the research is presented. This is followed by the specification and estimation of the structural equation model followed by the presentation of the results of the estimation. An analysis of the mining agreements, company reports and newspaper articles related to the companies used in the dataset follows. The quantitative results are then triangulated with the findings from the document analysis, interviews and observation. The conclusion is presented in the final section of the chapter

5.1 METHODOLOGY AND EMPIRICAL ESTIMATION

As was explained in the introduction, the three empirical studies contained of this thesis are united under the debt overhang –resource curse theme. Hence, the theoretical framework used in this chapter is also the same as that used in the previous chapters. Given the nature of the survey data collected, a structural equation model was specified and this was estimated using partial least squares. The quality of the model was then evaluated before the results were discussed.

5.1.1 THEORETICAL FRAMEWORK

Rossiter (2002) explained that the validity of indicators and variables should have theoretic rationale. From the theoretical framework utilised in the first and second empirical studies, the following relationships were specified:

Economic growth:

$$Y_t = f(CI_t, L_t, S_t, DS_t, Z_t) \quad (1.0)$$

Where y_t is output, CI_t is capital inflow DS_t is debt service, L_t is the total labour force, S_t is a vector of natural resource measures, and Z_t is a vector of carefully selected growth control variables

The debt service relationship is:

$$DS_t = f(Y_t, D_t, S_t, ER_t, V_t) \quad (2.0)$$

Where DS_t is debt service, D_t is the stock of debt, ER_t is the exchange rate and V_t a vector of debt sensitive control variables.

$$CI_t = f(Y_t, D_t, S_t, X_t) \quad (3.0)$$

Where CI_t is capital inflow, and X_t is a vector of capital inflow controls variables.

The final econometric model estimated revealed that the Human Capital Theory of the resource curse, the Institutional Theory, the 'Dutch Disease' Theory, the Conflict Theory and the Debt Overhang Theory explained the lagging growth experienced by Sierra Leone, despite its abundant natural resources. This provided the theoretical framework for questions included in the questionnaires, the interviews and the model estimated in this paper.

In "mainstream" economic theories, at the cost of gross simplification, the whole corpus of development economics is an integration of the theory of growth; hence, GDP growth used to measure economic growth is often taken to mean economic development. The concern here, as with other development economists such as Chipman and Moore (1971), Nordhaus and Tobin (1972), Morris (1979), Dasgupta and Weale (1992), Anand and Sen (1994) and Sen (1999), is the adequacy of GDP as a measure of well-being. Natural resource extraction is not only expected to contribute positively to economic growth in the strict sense of the word, but also to improve the wellbeing of the people in the economy where the resource deposits are located. Many of the assumptions made by growth models do not hold in reality. Examining Sierra Leone, the country is still developing, markets are incomplete, information is limited

and structural changes are still taking place. This thesis does not intend to question the traditional growth models, but will build on them to provide theoretical analyses which go beyond the simple use of aggregate production functions.

Todaro and Smith (2006) argued that, in addition to all the main topics of “traditional economics”, development economics “must deal also with the economic, social, political and institutional mechanisms, both public and private, necessary to bring about rapid ...and large scale improvements in levels of living .” Stiglitz, Sen and Fitoussi’s (2009) report on the Measurement of Economic Performance and Social Progress identified the key dimensions that should be taken into account when measuring development and wellbeing. According to this report, these dimensions should, at least in principle, be considered simultaneously: Material living standards (income, consumption and wealth); Health; Education; Personal activities, including work, Political voice and governance; Social connections and relationships; Environment (present and future conditions); and Insecurity, of an economic as well as a physical nature.

5.1.2 THE MODEL AND HYPOTHESES

The notion here is to develop a conceptual model that combines measures of economic variables, with underpinning located in the ‘human capital’, ‘institutional’, ‘Dutch Disease’, ‘conflict’ and ‘debt overhang’ theories of the resource curse, and measures to capture social dimensions, such as health, environment and standard of living. This study assumes that, in Sierra Leone, given its endowment of natural resources, the development expected as a result of the activities in the extractive industry is driven by activities of the household, the extractive firm and the government. Consequently the following hypotheses would be tested:

Hypothesis 1: Government’s activities, including debt servicing, lead to development in Sierra Leone.

Hypothesis 2: Mining firms positively contribute to development in Sierra Leone.

Hypothesis 3: Households’ productive activities result in development in Sierra Leone.

It is also assumed that Sierra Leoneans form expectations about the activities of both the Government and firms. The use of expectations in economic theory is not new as the theory of rational expectations was first proposed by John F. Muth in the early 1960s and many other economists, such as A. C. Pigou, John Maynard Keynes and John Hick, allocated people’s expectations about the future a central role in the determination of the business cycle. In general, the expectations theory implies that the outcome of economic situations partly depends on what people expect to happen.

For the purposes of this study, it is assumed that the expectations formed about the activities of the Government and mining companies influence their contribution to economic development. Therefore,

Hypothesis 4: Expectations of Sierra Leoneans positively affect how the Government, mining firms and households contribute to development.

This study also assumes that the activities of the household, firm and government to be multidimensional constructs. It considers them to have structural relations with much more observable separate constructs, called latent variables, supported by economic theory. Thus, to estimate the network of causal relationships among the activities of households, firms in the extractive industry, the Government and development in Sierra Leone, this research proposes a Structural Equation Model (SEM) that is based on the 'human capital', 'institutional', 'Dutch Disease', 'conflict' and 'debt overhang' theories of the resource curse, economic development notions and expectations theory. Structural equation models include a number of statistical methodologies meant to estimate a network of causal relationships, defined according to a theoretical model, linking two or more latent complex concepts, each measured through a number of observable indicators" (Esposito Vinzi, et. al., 2010).

The SEM allows the construction of latent variables which are not measured directly, but are estimated in the model from several indicators, each of which is predicted to 'tap into' the latent variables. Although this approach is similar to multiple regression, it can simultaneously test a series of dependent relationships while also simultaneously analysing multiple dependent variables (Joreskog, et al., 1999). Compared to multiple regression, it has a less restrictive assumption of measurement error as it is based on the assumption that each explanatory and dependent variable is associated with measurement error (Bollen, 1989). The structural model shows potential causal dependencies between endogenous and exogenous variables. In this chapter, a structural equation model is developed so as to estimate these networks of causal relations simultaneously. This method has become a quasi-standard in research, for example Bagozzi (1994), Hulland (1999), Babin, et al. (2008), Terzi, Trezzini and Moroni (2012), as it allows authors to test complete theories and concepts (Rigdon, 1998).

The theoretical framework in section 5.1.1 provides the foundation for the constructs of the model. The constructs of the study are conceptually related to each other by the structural model shown in Figure 3.0. From Figure 3.0, it is seen that expectations impact on the activities of the Government, firm and household which in turn impact on development. The Government's activities also impact the activities of the firm and the household. The activities of the firm also impact on the household. The ease of triangulating quantitative and qualitative findings is ensured by analysing the qualitative data collected within the same theoretical framework.

The triangulation of both quantitative and qualitative findings would result in well-rounded findings regarding the role of natural resources in economic development in Sierra Leone. This would enable this thesis to test the following:

Hypothesis 5: There is empirical and documentary evidence of natural resources-led economic development in Sierra Leone.

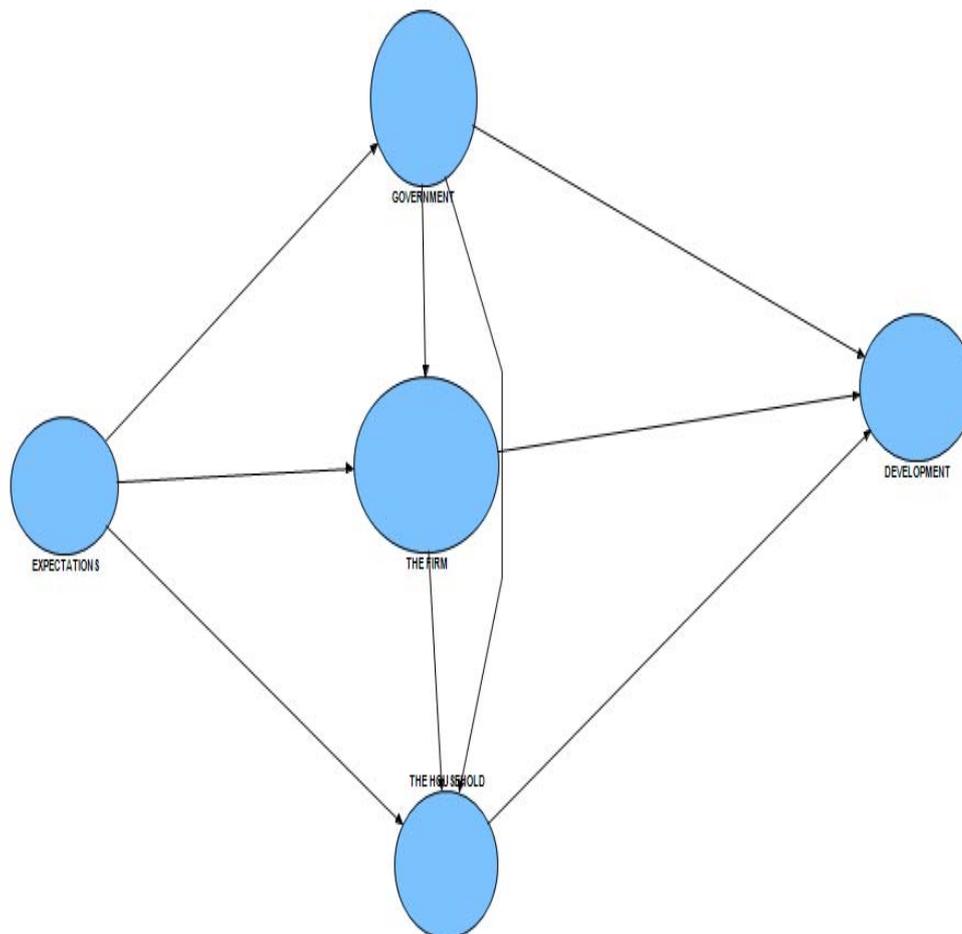


Figure 3.0: The Conceptual Structural Model

The theoretical concepts underlying the model have been highlighted and the causal relations between the constructs have been illustrated using a structural equations model. The model to be estimated showing the relationships with the latent variables and their respective indicators is specified in the next section.

5.1.3 MODEL SPECIFICATION

The complete model consists of an outer measurement model relating observed or manifest variables to their latent variables and an inner structural model relating some endogenous latent variables to other latent variables (Tenenhaus, et al., 2005). The inner model is essentially the conceptual model illustrated in Figure 3.0. It shows the causal relationships between the Government, the firm, the household, expectations and economic development (latent variables) in Sierra Leone. The outer measurement model relates a number of indicators to their latent variables. Baumgartner and Homburg (1996) stated that every latent variable should be measured by more than one indicator to ensure meaningful results. In the proposed model, every latent variable is measured by more than one indicator. The choice of indicator is based on growth theory, the various theories that have emerged in the resource curse literature and the expectations theory. The direction of path relationships of the measurement model and the causality between each latent variable and its indicators are described by the reflective model being specified. The direction of causality is from the construct to the indicators. Variations in a latent variable are expected to be manifested in changes in all of its indicators.

Firstly, considering the Government latent variable, standard growth theory and the Institutional Theory of the resource curse form the basis for the choice of indicators. This study assumes that the capital accumulation needed to drive aggregate demand can be stimulated by government expenditure. Government expenditure in this study comprises of government expenditure on wages, debt servicing, national savings, agriculture, health, education and infrastructure. Other studies that have used a measure of government expenditure to investigate the role of government in economic growth and development include Landau (1983), Loizides and Vamoukas (2005) and Jiranyaku (2013). The questions asked in the survey regarding government expenditure were specifically confined to the spending of resource rents. Hence, the responses solicited are expected to shed light on the Debt Overhang Theory and the Rentier State Theory.

According to the Institutional Theory of the resource curse, the quality of institutions affects their growth enhancing potential. In most studies, corruption is one of the indices used to estimate the quality of institutions; for example, Tornell and Lane (1999), Leite and Weidmann (1999) and Murshed (2003). In this chapter, therefore, government expenditure and corruption are indicators of government activity.

Output from labour, a factor of production in standard growth theory, is expected to contribute positively to growth and development. There is, however, both a demand side and supply side to the labour market. In the model, the firm demands labour and the household supplies labour. This demand-supply relationship of labour relating to the extractive industry is the basis of the 'Dutch Disease' explanation of

the resource curse (Sachs and Warner, 1999; Corden and Neary, 1982; Torvik, 2001). Technology accumulation and transfer has been shown in growth theory to lead to economic growth. This capability is enhanced by human capital development, often proxied by educational attainment (Wood and Mayer, 1998; Gylfason, 2000; Wright and Czelusta, 2004). In the proposed model, the firm supplies the technology by teaching and the household accumulates the technology by learning. It has also been explained in the literature that extractive activities divert labour away from agriculture and affect wildlife and the environment. (Krautkraemer, 1985; Partha, 1996). Manifest variables for wildlife, farming and the environment are incorporated as indicators for the firm's latent variable. One prominent topic in managing organisations is the issue of corporate social responsibility (CSR). Firms are expected to contribute to the socio-economic fabric of society through their corporate social responsibility provisions (Warhurst and, Mitchell, 2000, Jenkins, and Yakovleva, 2006; Hamann, 2003). A measure of CSR is one of the indicators relating to a firm.

The household is the primary unit of the economy. Income level in many studies has been used as a measure of growth and development (Hatwick, 1990; Deininger and Squire, 1996; Leamer, Maul and Rodriguez, 1999). For the purposes of this research, household income, before and after the commencement of extractive activities by mining firms, is an indicator for the household latent variable. Level of education and willingness to learn are used as proxies for human capital and absorptive capacity for technological transfer, hence accounting for the Human Capital Theory and technology transfer explanations of the resource curse. Unemployment is used to estimate the utilisation of labour. It is evident from the development debate that inequality is a deterrent to development. A measure of inequality is added to the indicators for the household latent variable. The 'conflict' explanation for the resource curse (Collier and Hoeffler, 2000; Ross, 2004; Miguel, et al., 2004) is also accounted for by this model.

All the chosen indicators reflect the same underlying construct and have been chosen to be highly correlated. An increase in the latent variable would cause an increase in all its manifest variables. The causal links among the network of relationships already explained are expected to provide an estimate of the impact of the Government, firm and household on development. In this case, development is indicated by development in the strict use of the word; standard of living and inequality. These causal linkages are illustrated by the model specified in Figure 4.0.

The selected indicators are expected to have high impact and the confirmation of their impact on economic growth and development is suggested by theory. Too many indicators may lead to excessive power for the goodness-of-fit tests (MacCallum, Browne and Sugawara, 1996) which, in turn, may significantly limit the usefulness of estimation results.

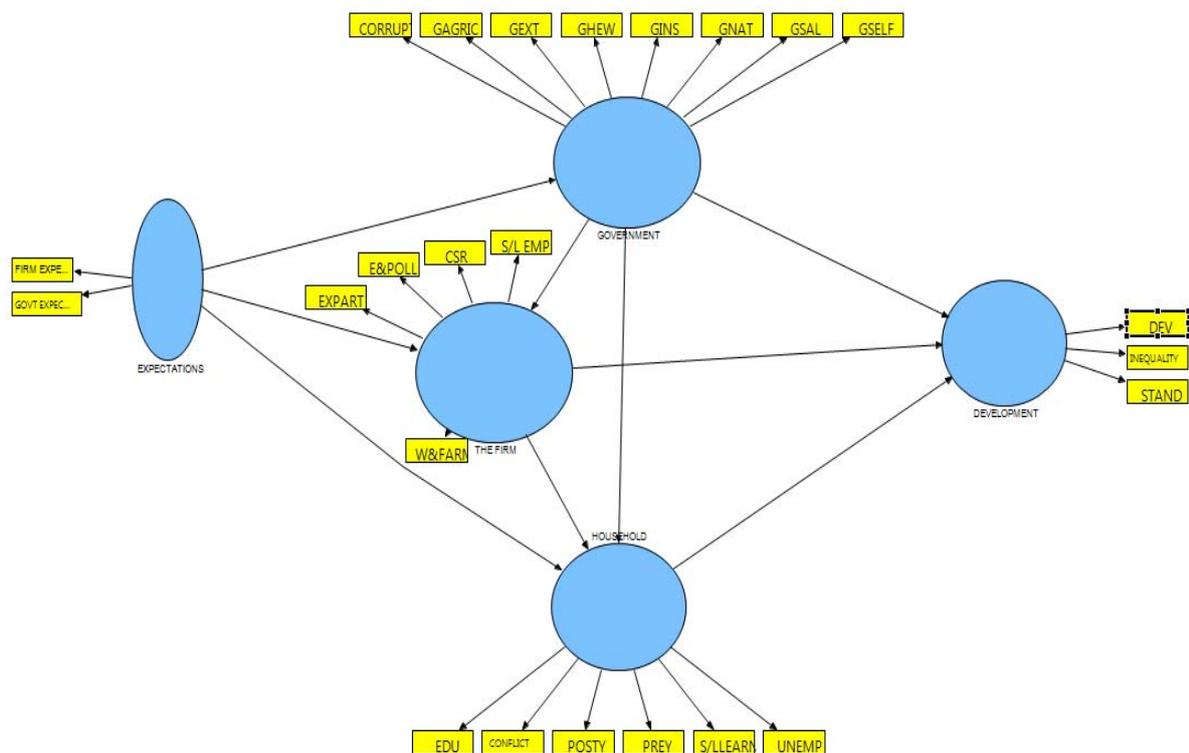


Figure 4.0 : The PLS Path Model

By estimating the model specified and triangulating the estimation results with findings from mining agreements, company reports, newspaper articles and interviews, this study seeks to test the following hypotheses illustrated in Figure 5.0.

- H1: Government’s activities, including debt servicing, lead to development in Sierra Leone.
- H 2: Mining firms positively contribute to development in Sierra Leone.
- H3: Households’ productive activities result in development in Sierra Leone.
- H4: Expectations of Sierra Leoneans positively affect how the Government, mining firms and households contribute to development.
- H5. There is empirical and documentary evidence of natural resources-led economic development in Sierra Leone.

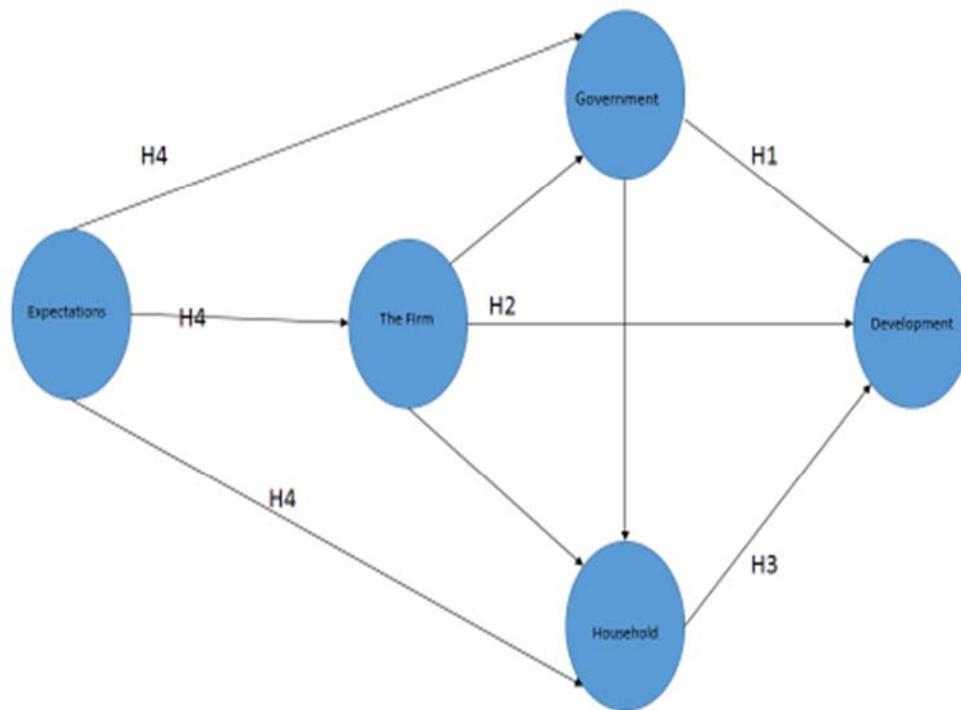


Figure 5.0: The PLS Path Model Hypotheses

It follows from the discussion of the model specification that H1 is connected to the Quality of Institutions Theory, Debt Overhang Theory and also the Rentier State Theory. H2 has roots in the Human Capital Theory, Technology Transfer Theory, and ‘Dutch Disease’ Theory. H3 is underlined by the Human Capital Theory, Conflict Theory, Technology Transfer Theory and Welfare Theory. H4 is inspired by the Rational Expectations Theory. The expected signs of the paths between the latent variables are shown in Table 3.1.

Table 3.1: Expected Signs of Path Coefficients

Path	Expected Sign of Path Coefficient
Expectations -> Government	+
Expectations -> Firm	+
Expectations -> Household	+
Government-> Firm	+
Government-> Household	+
Government-> Development	+/-
Firm-> Household	+
Firm-> Development	+/-
Household-> Development	+/-

5.1.4 DATA

The main source of data for the quantitative investigation is from a survey conducted through the administering of questionnaires. Brief, semi- structured interviews with twenty random individuals exploring concerns of the effect of the resource extraction boom in Sierra Leone on key development indicators were conducted. This assisted in developing a well-rounded questionnaire that captured the sentiments of the local populace in both the private and public sector. The first draft of the questionnaire was used for a pilot survey of fifty randomly selected individuals. A few adjustments were made regarding number of questions and ease of answering. The responses to the pilot questionnaire do not form part of the final data used in the estimation.

The final semi- structured questionnaire was administered to locals and staff living in the communities where the activities of four companies in the resource extracting industry were concentrated and a random selection of individuals living outside these communities (the Control Group) to elicit qualitative and quantitative responses. The four communities are: Makeni (African Mineral Ltd), Lunsar (London Mining Ltd –Marampa Mine), Rutile (Sierra Rutile Ltd) and Gondama (Sierra Minerals Holding Ltd). The control sample was randomly selected from the population living in the capital city, Freetown. The communities chosen are the locations of the extractive activities of the four largest mining companies in the country. Even though Sierra Leone is well known for its diamonds, this piece of research investigates only the impact of companies extracting rutile, iron ore and bauxite. It is the activities of these companies that have been driving post-conflict GDP growth and continue to heavily influence economic growth forecasts.

Given the nature of this research, the data contained both factual and opinion based information. The questionnaire covered perceptions of the impact of resource extraction on standard of living, health, education, social amenities, labour relations, community initiatives, the environment, corporate social

responsibility, incomes, corruption, debt, incomes, expectations and economic development as a whole. In most cases, the questions were asked in ‘krio’, the local dialect. The self-designed questionnaire had a mix of 5-point Likert-scale type questions, multiple choice responses and open ended questions. The responses to the 5-point Likert-scale type questions were used in estimating the model specified in Section 5.1.3. The remaining responses were analysed and triangulated with the other qualitative data. Table 3.2 describes the variables and indicators of the model presented in Figure 5.0. The total number of questionnaire responses collected is 1,339: Sierra Mineral Holdings Limited, 288 respondents; African Minerals (Sierra Leone) Limited, 202 respondents; London Mining (Sierra Leone) Limited, 277 respondents; Sierra Rutile Limited, 272 respondents; and the Control Group, 261 respondents. According to Reinartz, et al. (2009), 100 observations can be sufficient to achieve acceptable levels of statistical power given a certain quality of the measurement model. This study, therefore, has sufficient observations to guarantee the quality of the measurement model.

Key individuals were selected for the semi-structured interviews. Selection was based on professional capacity and knowledge regarding the resource sector, the economy and the Sierra Leonean society as a whole. To foster greater confidence and clearer truth, the interviewees were guaranteed to be kept anonymous as some of them held public office. The interviewees comprised individuals in management in the four companies, a Town Chief (traditional Leader), a women’s movement leader, a Member of Parliament, member of staff from the National Revenue Authority, the Ministry of Finance, the Ministry of Mines and the Ministry of Labour, and a youth leader. Most interviews were conducted in English; for those conducted in ‘krio’, the observations and discussions were then translated into English. The responses of most of the interviewees were collected using recording equipment and transcribed a few hours later. However, a few declined to be recorded, therefore responses were recorded manually.

Factual information was sourced from document analysis and the researcher’s observations. Copies of the Mining Agreements signed by the four companies with the Government of Sierra Leone were sourced from the House of Parliament Library. Quarterly and Annual Company Reports are publicly available on the company websites. Government Statistics regarding mining revenues were collected from the National Revenue Authority and the Ministry of Finance. Newspaper articles related to the activities of the four companies were collected from the most widely circulated newspapers in the country between January 2000 and September 2013 as well as a few foreign outlets focusing on mining related news. Findings from a five-month rotational observation of life in mining communities were incorporated into the analysis.

Summary statistics for all the survey data are presented in Appendix Six.

Table 3.2 : Constructs and Measurement Items (Questionnaire)

Latent Variable	Indicator	Item
Government	CORRUPT	Mining activities lead to increased corruption in Government
	GAGRIC	The Government spends enough on Agriculture
	GEXT	The Government spends enough on repaying external debt
	GHEW	The Government spends enough on health,education and water
	GINS	The Government spends enough on Infrastructure
	GNAT	The Government spends enough on national savings
	GSAL	The Government spends enough on salaries
	GSELF	The Government spends a lot on self-enrichment
	GEXP	The Government spends mining revenue on the right things
Household	EDU	I attained a certain level of education
	CONFLICT	Dissatisfaction with the effect of mining companies will lead to conflict
	POSTY	Household income increased since mining activities started
	PREY	Pre-mining household income was adequate for comfortable survival
	S/L LEARN	Sierra Leoneans are willing to learn from expatriates
	UNEMP	More Sierra Leoneans need to find work
Firm	EXPART	Expatriates are willing to teach Sierra Leoneans new technology
	CSR	Mining companies exercise adequate corporate social responsibility
	E & POLL	Mining affects the environment and increases pollution
	S/L EMP	Mining companies employ enough Sierra Leoneans
	W& FARM	Mining activities affect wildlife and reduce farming
Development	DEV	Natural Resources lead to development
	INEQUALITY	Natural Resource reduce inequality in incomes
	STAND	Natural Resources improve standards of living
Expectation	GOVERNMENT EXPECT	I expect the Government to do more regarding the development and welfare of Sierra Leoneans
	FIRM EXPECT	I expect the mining companies to do more regarding the development and welfare of Sierra Leoneans

3.1.5 MODEL ESTIMATION

The structural equation model specified in Section 5.1.2 and shown in Figure 5.0 was estimated using the Partial Least Squares (PLS) path-modelling algorithm; hence it is a partial least squares path model. PLS is an iterative algorithm that simultaneously solves the blocks of the measurement model and estimates the path coefficients in the structural model (Henseler, 2010). PLS understands the latent variables of the structural model as weighted sums of their respective indicators and predicts values for the latent variables using multiple regressions (Chin, 1998b; Chin and Newsted, 1999; Fornell and Bookstein, 1982; Fornell and Cha, 1994). Unlike covariance-based structural equation modelling (CBSEM), PLS has less restrictive distributional assumptions and does not require the data to be normally

distributed (Fornell and Bookstein, 1982; Bagozzi and Yi, 1994; Fornell and Cha, 1994). The SMARTPLS Version 2.0 software was employed for estimating the model as it can estimate both the measurement model and the structural model simultaneously (Ringle, et al, 2005). The item scales are comparable, so the model estimation was performed using the original data, as in Chatelin, et al. (2002).

As a first step to the estimation of the model, the possibility of common method bias (CMB) was tested. Common method bias arises when the covariance caused by the measurement approach rather than the measured trait causes measured relationships between two constructs to either inflate or attenuate compared to the true value (Williams & Brown, 1994; Burton-Jones, 2009). This is possible in cases where the variables are collected using the same survey instrument, in this case, a questionnaire.

The most commonly used statistical method for examining the extent to which common method variance is present in the data is Harman's single factor test (Podsakoff and Organ, 1986). In this technique, exploratory factor analysis is applied to evaluate the amount of variance in observed variables that can be explained by a single factor. If either a single strong factor emerges or the first factor loads significantly on all items, common method variance is most likely present in the data (Podsakoff and Organ, 1986). Kemery and Dunlap (1986), however, pointed out that Harman's single factor test has some limitations as there are no clear guidelines available as to when this technique indicates a problematic amount of method variance, and that it does nothing to actually control the method variance. This led to the Marker Variable Approach (Lindell and Whitney, 2001; Malhotra, Kim and Patil, 2006; Podsakoff, MacKenzie, Lee and Podsakoff, 2003; Chin, et al. 2012). This technique, which is similar to Harman's single factor test, includes an a priori defined marker variable that should be theoretically unrelated to the study's variables and then calculates the correlation between this variable and the study variables. The correlation is assumed to solely result from method variance and can be partialled out from other correlations in the study.

Most marker variable approaches, for example the Measured Latent Variable Marker (MLVM) proposed by Chin, et al. (2012), can only be used before data collection. Since, for this study, the data had already been collected, the Confirmatory Factor Analysis Marker (CFA) by Williams, Hartman and Cavazotte (2010) was used to test for common method bias. The CFA marker differs from the previously described techniques by using a directly measured method factor rather than building a proxy based on the substantive items in the model. As in the previously mentioned methods, the indicators of the method factor are theoretically unrelated to any of the constructs of interest and preferably not correlated, except for the correlation caused by sharing the same method. (Richardson et al., 2009). Thus, the common method variance is controlled for in the inner model rather than partialing it out during the outer estimation. Conceptually, this means that the calculated values from the outer estimation for the latent constructs are a result of the true relationships between the constructs (Williams, et al., 2010). Somewhat

similar approaches, although only for diagnostic purposes, have been previously adopted in recent PLS papers; for example, Shutao Dong, et al. (2009) and Pavlou, et al. (2007).

Once the absence of common method variance had been confirmed, the PLS algorithm was applied. The model was not re-specified at any stage. Anderson and Gerbing (1988) argued that re-specifications should be based on theory and content considerations in order to avoid exploiting sampling error to achieve satisfactory goodness of fit. Brannick (1995) argued that re-specifications should not be done at all. In the current research, the model estimated is based on the theoretical framework presented in section 5.1.1. Therefore, all indicators, both significant and insignificant, in the measurement model are kept because they are conceptually justified (Jarvis, et al., 2003).

Separate models are estimated for each community (sub-sample) and then a 'Total Sample' model is estimated for the total sample. The PLS algorithm not only calculates path coefficients, but also enables quality pointers for both the structural and measurement model to be reported. Separate models were estimated for each community and the control sample was selected from the capital city, to account for location differences and the contributions of the individual companies' extractive activities to growth in Sierra Leone. Each of these companies has signed different mining agreements with the Government of Sierra Leone and each has unique business structures.

To test whether the path coefficients differ significantly from zero, that is, statistically significant, t-values were calculated using bootstrapping procedure. Contrary to the default setting of 100 cases and 100 samples in SMARTPLS, this piece of research, according to Chin's (1998) recommendations, carried out the bootstrapping procedure to evaluate the statistical significance of each path coefficient and get more stable results. The predictive relevance of the model was tested by Blindfolding. Omission Distance of 7 was used. Cross-validated communality and cross-validated redundancy measures were analysed to evaluate how well the model predicted the effect of the endogenous variables on the key dependent variable, development. The already stated hypotheses were tested and the results are presented in the next section.

5.2 THE EMPIRICAL RESULTS

The primary concern has been to define a structural equation model connecting the activities of the Government, the firm and the household, including consumer expectations, to development in Sierra Leone. The responses gathered from the questionnaires gave measures of the indicators for the firm, the Government and household. Perceptions of the contribution of mining activities to income inequality, standard of living and economic development were used as indicators for development.

To help with common method bias, the respondents were assured of the anonymity and confidentiality of the study and that they should answer as honestly as possible. Chang, van Witteloostuijn and Eden (2010) pointed out that measuring the dependent variable in different ways helps avoid potential CMB with independent variables that were operationalized as perception-based measures. The dependent variable in this study was measured in three different ways. The empirical Williams, et al. (2010) CFA Marker test for common method bias was used to test for common method bias. The marker variable was indicated by demographic factors: gender, marital status and migration status. These indicators are theoretically unrelated to any of the constructs of interest and, therefore, any potential correlation would be caused by sharing the same data collection method. The results for all the models failed to show any presence of common method bias.

The PLS model was analysed and interpreted in two stages. The measurement model was first evaluated through an assessment of the validity and reliability of the construct measures in the model. This guaranteed that only reliable and valid construct measures were used (Hulland, 1999). In the second stage, the structural model was evaluated by analysing the path coefficients between the constructs. Path coefficients are indicators of the model's predictive ability. Thus, accordingly, the results of the measurement model are discussed followed by those of the structural model. The main results concerning the path model showing path coefficients and their significance levels for each sub-sample are represented in Table 3.7 and Table 3.8.

-The Outer Measurement Model

In PLS, individual initial factor reliability is assessed by examining the loadings of respective factors on their respective latent constructs. The higher loadings imply that there is more shared variance between the construct and its indicators than error variance (Hulland, 1999). Studies such as Bentler and Chou (1987) and Hulland (1999) recommended that standardised indicator loadings be greater than or equal to 0.70. In this study, all constructs were maintained regardless of loadings as the aim was to avoid re-specifications that were not based on theory and content considerations (Anderson and Gerbing, 1988). The estimated reflective loadings and their accompanying significance levels for the sub-samples estimated are reported in Table 3.3. The loadings for the 'Total Sample' model are shown in Table 3.4.

-Factor Loadings

Table 3.3: Sub-Sample Models' Factor loadings

	EDU	CONFLICT	CORRUPT	CSR	DEV	E & POLL	EXPART	EXPECT	GEXP
African Minerals Ltd	0.7282*	0.8108*	0.9711*	1.1911*	0.7396*	0.8412*	1.3121*	0.7168*	0.5571*
London Mining Ltd	0.9546*	0.8814*	0.9717*	0.9363*	0.9127*	0.8913*	0.9072*	0.8580*	0.9730*
Sierra Minerals Holding	0.9151*	0.9407*	0.9383*	0.9392*	0.8680*	0.9527*	0.9444*	0.9284*	0.8520*
Sierra Rutile Ltd	0.9323*	0.9120*	0.9830*	0.9152*	0.8718*	0.8665*	0.9189*	0.9444*	0.9804*
Control Group	0.9486*	0.9684*	0.9425*	0.9447*	0.9690**	0.9016*	0.8597*	0.9466*	0.8849*
	STAND	UNEMP	POSTY	S/L EMP	S/L LEARN	PREY	W&FARM		
African Minerals Ltd	1.1533*	0.7137*	0.7531*	0.9567*	0.6584*	0.8406*	0.8325*		
London Mining Ltd	0.9507*	0.5158*	0.5719*	0.9185*	0.8522*	0.7387*	0.8549*		
Sierra Mineral Holdings	0.9099*	0.9031*	0.6979*	0.9775*	0.8014*	0.8442*	0.9564*		
Sierra Rutile Ltd	0.8274*	0.7014*	0.7396*	0.9046*	0.9467*	0.6803*	0.7669*		
Control Group	0.8064*	0.8665*	0.6299*	0.9751*	0.9368*	0.9513*	0.9517*		
*: Significant at 1% level									
**: Not statistically significant									

For the African Minerals Ltd model, S/L Learn had a factor loading of 0.6584 that was significant at the 1% level. All the other factors loadings are greater than the recommended 0.7 and are all statistically significant at the 1% level. For the London Mining model, even though unemployment (UNEMP) and post mining income (POSTY) had statistically significant loadings they only exhibited factor loadings of 0.5158 and 0.5719 respectively. All the factors for the Sierra Mineral Holdings model had factor loadings greater than 0.70 and were all statistically significant. Apart from pre-mining income (PREY) with a loading of 0.6803, all the other factors loadings for the Sierra Rutile model were statistically significant and greater than 0.70. The factor loadings from the Control Group model revealed that only POSTY had a factor loading lower than 0.70.

Table 3.4: Total Sample Model Factor loadings

	EDU	CONFLICT	CORRUPT	CSR	DEV	E & POLI	EXPART	EXPECT	GAGRIC	GSAL	GEXT
Total Sample	0.8800*	0.8975*	0.4621*	0.8554*	0.5530*	0.7411*	0.8814*	1.0000*	0.9770*	0.9669*	0.9592*
	STAND	UNEMP	POSTY	S/L EMP	S/L LEARN	PREY	W&FARM	GHEW	GINS	GSELF	GNAT
	0.9637*	0.5542*	0.7900*	0.9124*	0.7264*	0.8181*	0.8132*	0.9614*	0.9451*	0.7373*	0.9761*

From Table 3.4, all the indicators of the Total Sample model loaded significantly their various constructs. These factor loadings indicate that the indicators selected by this study play significant roles in defining each construct, making each indicator representative of the corresponding construct it is intended to measure. This evidence of factorial validity is equivalent to confirmatory factor analysis as in Gefen and Straub (2005).

-Reliability Assessment

Internal Consistency: The analysis continued by assessing the Internal Consistency of the models estimated. The traditional criterion for Internal Consistency is Cronbach's α (Cronbach, 1951), which provides an estimate for the reliability based on the indicator inter correlations (Bagozzi and Yi, 1988). George and Mallery (2003) provided that Cronbach's α that is less than 0.6 is 'questionable', greater than 0.7 is 'acceptable', greater than 0.8 is 'good' and greater than 0.9 is 'excellent'. From Table 3.5, it is clear that all the indicators for the various models estimated had 'acceptable' to 'excellent' Cronbach's α ; except for the London Mining model where the indicators on Expectations have a Cronbach's α of 0.6842; the Sierra Rutile model where development indicators have a Cronbach's α of 0.5069; and the indicators of development in the Total Sample model which have a Cronbach's α of 0.6172. It is

noticeable that one of the Cronbach's α reported, Sierra Rutil model development indicators, exhibits Cronbach's alpha of 0.5069; the Cronbach's α criterion alone is insufficient in concluding the reliability of each indicator.

Although the Cronbach's α is the most common measure of reliability, it has limitations. For example, the Cronbach's α wrongly assumes that all items contribute equally to reliability (Bollen, 1989). Therefore, in this study, in addition to Cronbach's α (1951), the reliability of each indicator was assessed through Fornell and Larcker's (1981) measure of composite reliability. This measure is preferred over Cronbach's α because it offers a better estimate of the variance shared by the respective indicators (Hair, et al., 2006). The results indicate that the composite factor reliability coefficients of the constructs ranged from 0.7256 to 0.9815 (see Table Seventeen), which meets the standard of 0.70 suggested by Fornell and Larcker (1981). Nunnally and Bernstein (1994) pointed out that, despite the choice of reliability coefficient, an internal consistency reliability value above 0.7 in early stages of research and values above 0.8 or 0.9 in more advanced stages of research are regarded as satisfactory, whereas a value below 0.6 indicates a lack of reliability. The reliability of the indicators of this study is therefore confirmed.

-Validity

Once the reliability of the various indicators had been assessed, the research proceeded by evaluating the validity of the constructs. Both the convergent and discriminant validity were considered. Convergent validity refers to the degree of agreement in a set of indicators that represent the same underlying construct, which can be demonstrated through their uni-dimensionality, (Camines and Zeller, 1979). Fornell and Larcker (1981) suggested using the average variance extracted (AVE) as a criterion of convergent validity. An AVE value of at least 0.5 indicates sufficient convergent validity, meaning that, on average, a latent variable is able to explain more than half of the variance of its indicators (Fornell and Larcker 1981; Bagozzi and Yi, 1988; Goetz, Liehr-Gobbers and Krafft, 2009). The AVE of all the constructs reported in Table 3.5 are greater than 0.5, hence convergent validity is confirmed.

Table 3.5 : Reliability Assessment

Sample	Variables	Cronbach's α	Composite Reliability	AVE	R ²
African Minerals Ltd	AML	0.942481	0.956192	0.813773	0.941725
	AML Community	0.792524	0.856713	0.510163	0.931061
	Development	0.795868	0.907382	0.830467	0.927698
	Expectations	0.9136	0.9586	0.9205	0.0000
	Government	0.942343	0.971978	0.945484	0.527129
London Mining	Development	0.795868	0.907382	0.830467	0.927698
	Expectations	0.68420	0.8634	0.7596	0.0000
	Government	0.942343	0.971978	0.945484	0.459229
	LM Community	0.854307	0.894075	0.595191	0.931061
	LM	0.942481	0.956192	0.813773	0.941725
Sierra Rutile Limited	Development	0.5069	0.7696	0.705220	0.896441
	Expectations	0.8200	0.8848	0.6945	0.0000
	Government	0.962516	0.981580	0.963827	0.039000
	Sierra Rutile Community	0.884720	0.913383	0.640835	0.897196
	Sierra Rutile	0.926853	0.945560	0.777323	0.756489
Sierra Minerals Holding Ltd	Development	0.7190	0.7256	0.6945	0.891037
	Expectations	0.8662	0.7460	0.7408	0.0000
	Government	0.764321	0.891648	0.804753	0.516375
	SMHL	0.972364	0.978448	0.900829	0.924467
	SMHL Community	0.928049	0.947267	0.784307	0.951035
Control Group	Control	0.958977	0.968471	0.860246	0.926821
	Control Community	0.944184	0.958013	0.794674	0.954983
	Development	0.7546	0.8367	0.930872	0.964590
	Expectations	0.8897	0.9477	0.9006	0.0000
	Government	0.875272	0.941292	0.889096	0.696218
Total Sample	Development	0.6172	0.750367	0.617284	0.841345
	Government	0.955805	0.967111	0.792693	0.4348
	Household	0.871205	0.904774	0.618005	0.895549
	Firm	0.899009	0.924296	0.710432	0.535311
	Expectation	0.8115	0.9139	0.8414	0.0000

Discriminant validity shows the degree to which any construct is different from the other constructs in the model (Carmines and Zeller, 1979). In Fornell and Larcker's (1981) test for discriminant validity, pair-wise correlations between factors obtained were compared with the variance extracted estimates for the constructs making up each possible pair. In this thesis, discriminant validity was done by comparing the square of the correlations among the latent variables with the AVE of each construct (Chin, 1998;

Hajli et al., 2013). The AVE for each construct is greater than its shared variance with any other construct; therefore discriminant validity is supported (Chin, 1998; Hulland, 1999; Tenenhaus et al., 2005; Majchrzak et al., 2005; Gregoire and Fisher 2006).

General Model Evaluation:

The PLS model was then evaluated through observation of the R-squared calculation for dependent latent variables (Chin, 1998; Cohen, 1988). R^2 measures a dependent construct's percent variation that is explained by the model (Wixom and Watson, 2001). The R^2 for each dependent construct in the model is shown in Table 3.5. This shows how well the model explains the hypothesized relationships. The R^2 ranged from 42% to 96% for all the dependent constructs except that of the Government construct in the Sierra Rutile model, wherein it was only 3%. This is interpreted as 'the residents of the Rutile community do not have much knowledge of government activities related to natural resource extraction in Sierra Leone'.

There are conflicting views on evaluating the structural model using Goodness-of-Fit. Studies such as that conducted by Tenenhaus, et al. (2005) evaluated the PLS structural model by Goodness-of-Fit (GoF). However, in a very recent study by Henseler and Sarstedt (2013), simulation shows that the GoF and the relative Goodness-of-Fit index (GoFrel) are not suitable for model validation. Therefore in this study, the communality and redundancy for the indicators that show Goodness-of-Fit are not reported.

-The Inner Structural Model

The quality of the outer model has been evaluated and the results presented. This study now presents the analysis of the inner structural model. In the PLS method, the structural model and hypothesis were tested by computing path coefficients. Contrary to Covariance Based Structural Equation Modelling, PLS path modelling does not report fit indices like Tucker-Lewis Fit Indices (TFI), Root Mean Square Error Approximation (RMSEA) or Comparative Fit Indices (CFI). This is because PLS does not make any distributional assumptions for parameter estimation and, as such, does not require the data to be normally distributed. In evaluating the inner model, cross -validated redundancy and cross- validated communality indices were assessed.

The cross-validated redundancy index represented by the Stone-Geiser Q^2 -statistic measures the quality of the structural model for each endogenous block, taking into account the measurement model. Redundancy is the "capacity of the model to predict its manifest variables from the indirectly connected latent variables" (Chantelin, Vinzi and Tenenhaus, 2002). A Stone-Geiser Q^2 -statistic less than zero

means that the model lacks predictive relevance (Stone, 1974; Geiser, 1975; Fornell and Cha, 1994; Tenenhaus, et al., 2005).

The cross-validated communality index measures the quality of the measurement model for each block. The index represented by the q^2 statistic measures the predictive relevance of the model by reproducing the observed values by the model itself. A q^2 statistic greater than zero means the model has predictive relevance, (Fornell and Cha, 1994). It is evident from the results presented in Table 3.6 that all the Q^2 and q^2 values are greater than zero, providing proof of the model estimated having achieved predictive relevance.

Table 3.6: Predictive Relevance of the PLS Model

Sample	Construct	Cross Validated Communality(q^2)	Cross Validated Redundancy(Q^2)
African Minerals Ltd	Firm	0.7923	0.6899
	Household	0.5425	0.5345
	Government	0.8087	0.7137
	Expectations	0.9919	0.4334
London Mining Ltd	Firm	0.7663	0.6830
	Household	0.5602	0.5035
	Government	0.8094	0.7928
	Expectations	0.7550	0.7113
Sierra Rutile Ltd	Firm	0.7608	0.4802
	Household	0.6252	0.5259
	Government	0.8331	0.4260
	Expectations	0.5159	0.5411
Sierra Minerals Holdings	Firm	0.8684	0.7533
	Household	0.7387	0.7541
	Government	0.5401	0.4131
	Expectations	0.7827	0.6139
Control Group	Firm	0.7844	0.7739
	Household	0.7481	0.7643
	Government	0.6702	0.7463
	Expectations	0.9006	0.895
Total Sample	Firm	0.7100	0.5338
	Household	0.6180	0.5591
	Government	0.7924	0.5393
	Expectations	0.8448	0.845

The analysis has proven that the quality of the outer measurement model and inner structural model of the PLS model presented in Figure 5.2 passed quantitative scrutiny and its prediction of the relationships among the latent variables are valid. This study now evaluates the path coefficients, similar to regression coefficients. The hypothesized path coefficients, along with their bootstrap values, T-statistics and P-

values, are reported in Table 3.7 (mining company communities sub-sample) and Table 3.8 (Control Group and Total Sample).

Table 3.7: Path Coefficients of PLS Model (Sub-samples)

Sample	Variables	Coefficient	Standard Deviation	T-statics	P-value
African Minerals Ltd	Expectations -> Government	0.677664	0.013347	54.522	0.0000
	Expectations -> Firm	0.424569	0.008294	67.4454	0.0000
	Expectations -> Household	0.446269	0.052294	10.9033	0.0000
	Government-> Firm	0.610831	0.008985	56.0708	0.0000
	Government-> Household	-0.318716	0.043974	-3.9411	0.0001
	Government-> Development	-0.859424	0.026923	-32.1031	0.0000
	Firm-> Household	0.841339	0.085159	6.4561	0.0000
	Firm-> Development	-0.222766	0.052123	-4.7623	0.0000
	Household-> Development	0.391119	0.033276	12.3919	0.0000
London Mining	Expectations -> Government	0.9160	0.0047	193.7098	0.0000
	Expectations -> Firm	0.7688	0.0250	30.7698	0.0000
	Expectations -> Household	0.3613	0.0335	10.7728	0.0000
	Government-> Firm	0.2101	0.0263	7.9766	0.0000
	Government-> Household	-0.6455	0.0294	-21.9893	0.0000
	Government-> Development	0.8602	0.0267	32.1701	0.0000
	Firm-> Household	1.1639	0.0390	29.8645	0.0000
	Firm-> Development	-0.2527	0.0511	-4.9432	0.0000
	Household-> Development	0.4204	0.0327	12.8508	0.0000
Sierra Rutile Limited	Expectations -> Government	0.1975	0.0336	5.8693	0.0000
	Expectations -> Firm	-0.3488	0.0163	-21.3336	0.0000
	Expectations -> Household	0.0675	0.0148	4.5743	0.0000
	Government-> Firm	0.8686	0.0163	53.3894	0.0000
	Government-> Household	-0.0645	0.0402	-1.6044	0.1089
	Government-> Development	0.0820	0.0350	2.3452	0.0192
	Firm-> Household	1.0092	0.0325	31.0719	0.0000
	Firm-> Development	0.6368	0.0946	6.7326	0.0000
	Household-> Development	0.2533	0.0848	2.9864	0.0029
Sierra Minerals Holding Ltd	Expectations -> Government	0.7773	0.0237	28.8661	0.0000
	Expectations -> Firm	0.2526	0.0293	24.8491	0.0000
	Expectations -> Household	0.1699	0.0272	14.7592	0.0000
	Government-> Firm	0.0871	0.0364	7.8211	0.0000
	Government-> Household	0.0937	0.0207	12.1365	0.0000
	Government-> Development	-4.3771	0.0309	-9.6969	0.0000
	Firm-> Household	0.4811	0.0432	9.1354	0.0000
	Firm-> Development	35.3579	0.0460	16.1010	0.0000
	Household-> Development	17.2062	0.0486	9.0431	0.0000

Table 3.8: Path Coefficients of PLS Model (Control Group and Total Sample)

Sample	Variables	Coefficient	Standard Deviation	T-statistics	P-value
Control Group	Expectations -> Government	0.9186	0.0061	150.8182	0.0000
	Expectations -> Firm	0.0881	0.0253	3.4801	0.0005
	Expectations -> Household	0.4387	0.0214	20.4541	0.0000
	Government-> Firm	0.8767	0.0244	35.8623	0.0000
	Government-> Household	0.2855	0.0238	11.9991	0.0000
	Government-> Development	-0.1815	0.0311	-5.8449	0.0000
	Firm-> Household	0.2891	0.0195	14.7898	0.0000
	Firm-> Development	-0.4388	0.0287	-15.3049	0.0000
	Household-> Development	-0.7342	0.0371	-19.8020	0.0000
Total Sample	Expectations -> Government	0.6594	0.0272	24.2187	0.0000
	Expectations -> Firm	0.7020	0.0253	27.7279	0.0000
	Expectations -> Household	0.2403	0.0341	7.0403	0.0000
	Government-> Firm	0.2721	0.0297	9.1550	0.0000
	Government-> Household	0.6710	0.0173	38.7520	0.0000
	Government-> Development	-0.5266	0.0522	-10.0795	0.0000
	Firm-> Household	0.1225	0.0322	3.8016	0.0002
	Firm-> Development	0.0591	0.0325	1.8162	0.0696
	Household-> Development	0.3604	0.0593	6.0825	0.0000

Hypothesis One: Government’s activities, including debt servicing, lead to development in Sierra Leone: - First, considering the results of the African Mineral model, government activities have a significant negative impact on development in Sierra Leone. It will be recalled that servicing external debt is one of the government activities estimated in this model. Hence, this significant negative impact of government activities provides some confirmation for the debt overhang –resource curse hypothesis. It is also worth noting that, even though government activities have a significant negative impact on households, there is evidence of a positive impact on the firm. Similar results were revealed by the London Mining model. However, contrary to the African Mineral model, government exhibited a positive impact on development. This is also true for the Rutile model. The positive impact of government on development and the firm in the Rutile model is, however, not as statistically significant as in the London Mining model. The degree of change brought about as a result of government activities is much less. The results in Table 3.7 show that the London Mining community has the highest level of the perception or experience of the Government’s development enhancing activities.

The path coefficients of the Government’s impact on development, household and firm for the Sierra Mineral Holdings, Control models and Total Sample models, revealed similar directional relationships. It is shown that, in absolute terms, the negative impact of the Government on development is greater at

the Sierra Mineral Holdings level (4.3771), which is greater than in the African Minerals model (0.859424) which is, in turn, greater than in the Control Group (0.1815). This shows that the negative impact of the Government on development is felt more by individuals living and working in mining areas than outside these areas. This research is of the opinion that this is because these individuals experience the daily effects of mining directly in all aspects of their lives and therefore have greater expectations of the Government. The Total Sample model confirmed a significant negative impact of the Government on development in Sierra Leone. It should be recalled that, in the models estimated in this study, corruption, self-enrichment and government spending on infrastructure, external debt and welfare are the indicators of government activities. Therefore, based on the opinion of the Sierra Leoneans sampled, at the national level, the Government's activities do not lead to development. The Quality of Institutions Theory, Debt Overhang Theory and Rentier State Theory explain why Sierra Leone's resource related less than expected development. Hypothesis One is accordingly rejected at the national level.

Hypothesis Two. Mining firms positively contribute to development in Sierra Leone: The estimated path coefficients reveal a significant negative impact of African Minerals Ltd and London Mining on development and a positive impact of Sierra Rutile Ltd and Sierra Mineral Holdings. Despite these mixed effects, the Total Sample model confirmed a positive but statistically insignificant effect of firms on development at the 5% level. Comparison of firm contribution to development at community level to national level reveals that the impact at national level is merely 0.0591. The positive perceptions of the firms' contribution at community level is mostly expressed by individuals employed by or doing business with these companies or having families employed by these companies who have benefited directly from their' activities. This leads this study to conclude that the closer one is to the activities of the mining companies' 'inner circle', the greater the benefit. This is supported by the minimal but positive impact at household level reported for all the models. These findings also provide support for the Human Capital Theory, Technology Transfer Theory, and 'Dutch Disease' Theory of the resource curse in Sierra Leone.

Hypothesis Three. Households' productive activities of result in development in Sierra Leone. :The households in all the mining communities contributed positively, but in varying degrees, to development in Sierra Leone. For the Control Group model, where the households were outside the mining communities the impact was found to be significantly negative. This further confirms the 'inner circle' explanation from Hypothesis Three. On the whole, from the Total Sample model it shows that households contribute positively to development in Sierra Leone, pointing to the importance of Human Capital Theory, Conflict Theory, Technology Transfer Theory and Welfare Theory in explaining Sierra Leone's resource related development. The greater the willingness and capability of Sierra Leoneans to learn and develop their skills, the greater the positive lead on development. These results confirm Hypothesis Three.

Hypothesis Four. Expectations of Sierra Leoneans affect how the Government, mining firms and households contribute to development: For all the models, expectations formed about the household and the Government are expected to influence their activities in such a way that the final result is a positive impact on development. Expectations formed about the firm are also expected to result in significant positive development effects, except for the case of Sierra Rutile Limited where the expectations are shown to be negative. Among the four companies under review, Sierra Rutile Ltd has been operational in Sierra Leone the longest. Therefore, individuals of the Rutile community have greater expectations of the company compared to expectations of the indigenes in the other mining areas about the companies operating in their communities. However, given their experiences over the years, the people of Rutile have rather lost faith in the company, hence their negative expectations. The results of the Total Sample model thus provide support for the Rational Expectations Theory’.

On the whole, from the model estimated, the activities of the household, firm and the Government explain 84% of the variation in development in Sierra Leone. Standard of Living and Development perception have significant factor loadings on development in Sierra Leone. It is worth noting that, in absolute terms, the impact of Government on development outweighs the impact of the household, which in turn outweighs the impact of the firm. This confirms the Government as the central planner whose policy decisions are crucial to ensuring that natural resource extraction leads to development in Sierra Leone.

The total view of the sample on the impact of natural resource extraction in Sierra Leone is illustrated in Figure 6.0 and Figure 7.0. In Figure 6.0, the respondents for the statement: ‘Natural Resources Improve Standards of Living’ had to choose from ‘Prosperous’, ‘Good’, ‘Average’, ‘Poor’ and ‘Very Poor’. The result of their responses for the statement: ‘Natural Resources lead to development’ is shown in Figure 6.0. From Figure 6.0, it is clear that, for all the respondents living in the mining communities, most perceive their standard of living to be very poor. Most of the respondents in the Control Group, however, perceived themselves to have a good standard of living. This disparity is not only due to the vast gap between the life style and income of indigenes and corporate employees of mining firms, but also a result of how ‘growth’ has mainly been limited to the capital city. Notwithstanding, the view that, in the case of Sierra Leone, resources do not lead to development is widely supported (see Figure 7.0).

Compared to the results of the SVAR estimation carried out in Chapter Four, the results of this chapter also confirmed the debt overhang- resource curse hypothesis for Sierra Leone. From Table 3.2, government activity is measured by government expenditure on debt servicing, infrastructure, health, education, water supply, salaries and corruption. The significant negative impact of the Government on development in Sierra Leone therefore accounts for debt overhang, inadequate expenditure on and poor management of infrastructure, poor social amenities and poor quality of institutions.

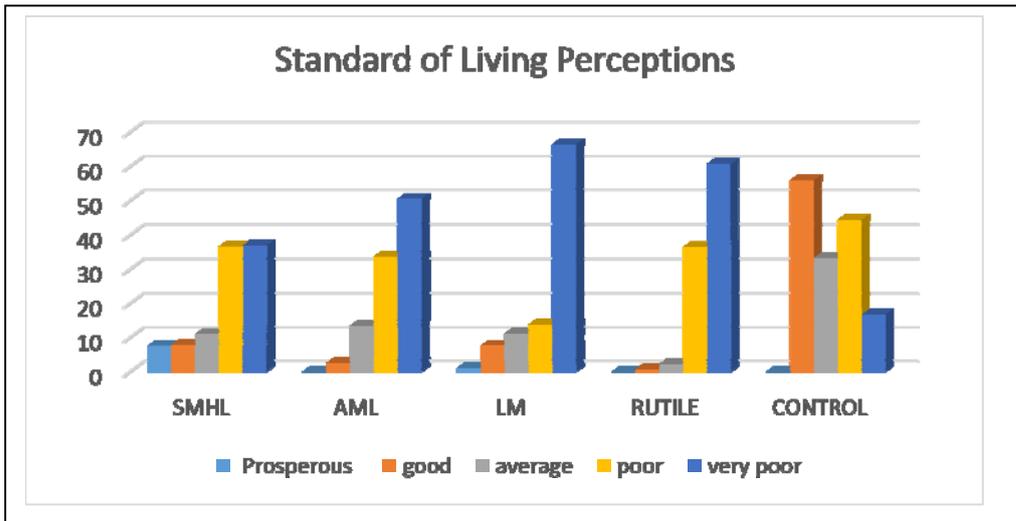


Figure 6.0: Comparison of Standard of Living Perceptions

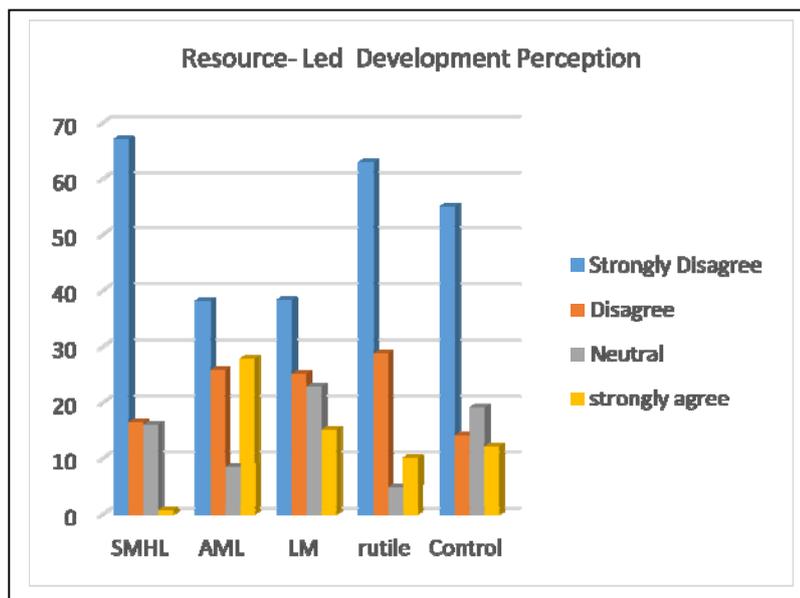


Figure 7.0 : Comparison of Resource-led Development Perception

Hypothesis Five. There is empirical and documentary evidence of natural resources- led economic development in Sierra Leone. This hypothesis will be tested in three stages in the next section of this thesis. Mining agreements, company reports and newspaper articles will be compared with the quantitative results already presented in this section.

In conclusion, the results from the estimation of the structural equation model illustrate that at the national level, government activities lead to a significant negative impact on development in Sierra Leone. This

confirms the debt overhang- resource curse hypothesis for Sierra Leone. It also revealed, however, that government activities have positive significant effects on mining firms and households. When the analysis was done at company community level, the effect of government activities on development was shown to vary across the communities where the four companies operate and outside these communities in the capital city. There were significant negative bearings on development of government activities in the African Minerals Ltd community, the Sierra Mineral Holdings community, the Sierra Rutile community and the capital city. On the other hand, the effect was significantly positive in the London Mining Ltd community.

The differing effects of the various mining companies on development and households' welfare reveal that the closer one is to the activities of the mining companies' 'inner circle', the greater the benefit from the companies' extractive activities. The people with the highest likelihood to gain from the companies' activities are those who are employed by or doing business with these companies, or have families employed by these companies. The Quality of Institutions and Conflict Theory, Human capital Theory, and the Rentier State Theory complement the Debt Overhang Theory in explaining the lagging growth experienced by Sierra Leone.

5.4 ANALYSIS OF DOCUMENTS

The data description section 5.1.4 of this chapter showed that, for the purposes of this study, the four mining communities that constitute most of the sample size were the operational locations of African Minerals Ltd (AML), Sierra Rutile Ltd (SRL), London Mining Limited (LML) and Sierra Mineral Holdings Ltd (SMHL). In this analysis of documents, firstly the agreements each of these companies signed with the Government of Sierra Leone will be analysed, followed by an examination of the company reports and, finally, media reports related to the activities of the four companies.

5.4.1 ANALYSIS OF MINING AGREEMENTS

-Background of the Companies:

Sierra Rutile Ltd (SRL): The Company's exploration activities and development started in 1962 through a company called Sherbro Minerals. In 1971, Nord Resources and Armco Steel acquired the assets of Sherbro Minerals and founded Sierra Rutile Ltd (SRL). The SRL mine is located on the world's highest grade rutile deposit, covering an area of 580 square kilometres in the southwest of Sierra Leone. The bulk of the deposits occur in the Imperi Hills, Gbangbama Hills and the Sembehun and Kasila Rocks areas. The company became the largest producer of rutile in the world in 1993, but in 1995 operations were interrupted by the civil war in Sierra Leone. The conflict officially ended in 2000 and the company's

assets were acquired by Titanium Fields Resources Ltd in 2001. Titanium Resources Group (TRG) acquired the assets from Titanium Fields Resources Ltd in 2005 and shipments of rutile re-commenced in 2006. In July 2008, TRG sold its Sierra Leonean bauxite subsidiary, Global Aluminium, to Vimetco N.V and TRG changed its name to Sierra Rutile Ltd in 2011. Currently, the company has an initial JORC-compliant resource of over 600 million tonnes and operates a self-sufficient mining site that includes its own port, power station, water supply system and local airport.

London Mining Ltd (LML): London Mining was founded in 2005 but acquired its license to start iron ore exploration in Sierra Leone in 2006. The company started production at its Marampa mine, based in the town of Lunsar, Port Loko District, in Sierra Leone in December 2011. It has other mine operations in Wadi Sawawin, Saudi Arabia, Isua and Greenland and investments in Columbia. Nevertheless, this study, only considers its operations in Sierra Leone. The Marampa mine was operated by the Sierra Leone Development Company and William Baird between 1933 and 1975. Low iron ore prices forced its closure in the 1960s. Failing markets and the civil war prevented redevelopment of the mine until London Mining acquired the mining licence in 2006. The mine has a resource of over 1 billion tonnes of iron ore.

Sierra Mineral Holdings Ltd (SMHL): Bauxite mining in Sierra Leone was started in the 1960s by Sieromco, a subsidiary of Alusuisse. However, operations were halted in January, 1995 due to civil unrest in the country. On the return of peace in 2001, TRG acquired the assets of Sieromco and was granted an exploration license and mining operations formally commenced in November 2005. Vimetco Group bought the company from TRG in July 2008. The company has its main deposits at Gbonge, Gondama, Jenega, Konta and Wunde with port facilities at Nitti. The Sierra Mineral Holdings Ltd mine is currently the only bauxite mine in Sierra Leone and has a resource base of approximately 31 million tonnes of bauxite.

African Minerals Ltd (AML): African Minerals Ltd has been active in Sierra Leone since 1996 following the discovery of the Tonkolili iron ore deposit. The Tonkolili deposit is located in the Sula Mountain range and comprises of four deposits: Simbili, Marampon, Numbara and Kasafoni. The company maintained its corporate office in Freetown from mid-1997 through 2002 during the civil war. The mine is fully operational and is being developed in phases. The operational infrastructure includes integrated mine, port and rail facilities.

This study now proceeds by giving a summary analysis of the most recent mining agreements these four companies have signed with the Government of Sierra Leone. The analysis will cover issues relating to ownership and company registration, initial terms of the agreements, leases and licenses, financial agreements, non-tax revenue, employment and immigration, corporate social responsibility, reporting and dispute resolution. Botswana is one of the leading examples of resource rich economies that have

escaped the 'resource curse'. A few comparisons would be made with Botswana mining legislation to highlight potential changes that would be advantageous to the Sierra Leonean economy.

- Ownership and Company Registration:

African Minerals Ltd is wholly owned by African Minerals Ltd and is incorporated in Bermuda. Sierra Rutile Ltd is 100% self-owned and incorporated under the laws of the British Virgin Islands. The Government of Sierra Leone had a 47% equity stake in the company but repealed ownership in May 2012 through a cash settlement of historical Pay-As-You-Earn (PAYE) taxes with approximately \$10,000,000 to be paid according to the 'Additional Royalty' payment plan. The Government, however, has the right to nominate two directors to the Board of Sierra Rutile Ltd. London Mining (SL) is wholly owned by London Mining PLC and incorporated in England and Wales. Sierra Mineral Holdings Ltd is owned by Vimetco N.V. Aluminium Group.

It is noticeable that the Government of Sierra Leone currently does not have an equity stake in any of the companies. It is common knowledge in corporate finance that the aim of company directors and managers is to seek the interest of their shareholders. This research is of the opinion that if the Government has a stake in any large company operating in the resource extraction industry, it is bound to enjoy more benefits, financial and otherwise. Comparing the ownership of companies to that of one of the largest mining companies in Botswana, Debswana Mining Company, which produces about 70% of Botswana's export earnings, a different structure is observed. In this company, the Botswana Government and De Beers Consolidated Mines Ltd each hold a 50% share and have equal representation on the board of the company. This current shareholding is more equal compared to the original shareholding of De Beers of 85% and the Botswana government of 15% when the company was incorporated in 1969.

Some of the reviewed mining companies are incorporated in tax havens such as Bermuda and the British Virgin Islands. This gives these companies corporate income tax advantages. In addition to the tax deals with the Sierra Leonean Government which this study would reveal, these companies stand to benefit from the very liberal ownership arrangements.

-Initial Terms of the Agreements:

The mining agreement between the Government of Sierra Leone and African Minerals Ltd was signed to mine iron ore and associated minerals for twenty-five years with the option of renewing the lease for a further fifteen years. The revised 2009 London Mining agreement was signed in 2012 and has the same duration and option for renewal as in the AML contract. The original pre-conflict Sierra Rutile 1989 agreement was revised and the new agreement was signed in 2002. The company's lease covers the mining of titanium and associated minerals for a period of thirty-three years and the lease can be extended for a further fifteen years on application to the Government. The Sierra Mineral Holdings

Ltd 2005 agreement for the mining of bauxite was updated in 2012 and is initially for a period of twenty years and can be renewed in accordance with applicable law. It is made clear in the agreements that if other precious minerals are recovered, for example diamonds, they should be delivered to the Ministry of Mines and Minerals. The company that discovers other precious minerals would have first right to apply for an exploration license in connection with the precious mineral find. In addition to the mining leases, all the companies applied and paid for mining licenses. According to the ‘Dan Watch Report’², 2011, in 2010, mining leases and licenses accounted for 19% (\$4.4 million) of government revenue from mining.

One noticeable fact is that the terms for qualification for the renewal of leases are not clearly spelt out in the agreements except for the case of SMHL, which has periodic review clauses and renewal is conditional on applicable law. In all the other cases, it seems that renewal is guaranteed upon the company applying to the Government. This ‘grey’ area does not help in regulating the activities of these companies. These agreements have also received opposition by some civil society groups in Sierra Leone, such as The National Advocacy Coalition on Extractives (NACE), on the basis that certain aspects contravene already existing Government legislature, especially the Mines and Minerals Act and the Income Tax act. As the analysis continues, this study provides support for such groups, especially in the financial aspects of these agreements.

-Company Rights:

The agreements made clear provision for the mining companies to have the right to terminate, transfer or surrender the leases. AML is allowed to terminate, transfer or surrender its lease upon giving ninety days written notice to the Government. Sierra Rutile Ltd has the right to terminate the agreement after giving six months’ notice to the Government. Even though the company is allowed to transfer or surrender its lease, the notice period required is not specified in its agreement with the Government. This is also the case for Sierra Mineral Holdings Ltd. The right to terminate, transfer or surrender is clearly stated, but the notice period is not specified. London Mining is required to give a year’s termination notice and a three month surrender notice to the Government of Sierra Leone. It is clear that these agreements lack uniformity on the notice period required to terminate, transfer or surrender the agreements. The basis on which termination, transfers or surrender can be done is also not clearly pointed out. With regards to the Government’s right to revoke a company’s license or lease, it is conditional on the company being in arrears for any sums of money due to the Government beyond six months or the company entering liquidation or the company being in breach of any terms of the signed agreements³. This study is of the

2 “Not Sharing the Loot”, published in October 2011, by the Danish Development Organisation – DanWatch, in association with Sierra Leone’s civil society group – Network Movement for Justice and Development (NMJD).

3 Section 52 and 53 of the Mines and Minerals Act , 2009

opinion that, apart from financial issues, without effective monitoring any other basis on which the Government can terminate or suspend the agreements would be difficult to identify should it arise.

All the companies are indemnified against claims for outside activities related to the mining industry and covered by the Mines and Minerals Act. They also have the right to construct the infrastructure needed to carry out mining operations within and without the mining area and relocate locals where necessary. They are also given the right to use water from natural sources, divert and return non-poisonous spoils to rivers and streams as long as they provide alternative sources of water for the locals. This research does not dispute that these rights are needed to aid the operations, but they seem to lack key regulatory points, especially for construction carried out outside the mining area. The agreements do not make any mention of provisions for future roads, land rights or town planning. There are also great differences in the quality of infrastructure, water supply and services provided by the companies for their own use and those provided for the local communities, further increasing the level of inequality in standards of living between locals and corporate employees.

-Financials:

According to the agreements, accounting records, tax assessments and all financial amounts are expressed in United States dollars. All the companies are allowed to freely receive and hold funds at any financial institution in any country of their choice. They are also exempted from paying commission on foreign funds remitted into Sierra Leone.

-Royalty Payments:

Royalty payable by the mining companies to the Government is calculated as a percentage of the calculated value of the mineral being sold⁴ within 45 days after the end of each month's shipment. AML pays royalty at the rate of 3% of the market value of iron ore being exported. SMHL also pays 3% of initial assessment of the value of bauxite being sold. This rate of 3% is the rate required by the Mines and Minerals Act, 2009. Sierra Rutile's rate of royalty in 1989 was 3.5% and this increased to 4% in 2006. The agreement also shows that the company should pay additional royalty of \$1,667,000 for each of the years 2010 to 2014 and \$1,665,000 for the year 2015. It should be noted that Sierra Rutile made interest free advance royalty payments (Royalty Credit) of \$1,000,000 in 1990 and \$1,040,000 in 1991 to offset any royalties payable by the company until exhausted. However, as per an agreement with the Government in 2003, SRL's royalty rate was reduced from 3.5 % to 0.5% until 2014, which is contrary to Sierra Leone's mining legislation. London Mining pays royalty at the rate of 3%. It is also has a 'Performance bond' of \$1million in the form of a letter of credit by a reputable Sierra Leonean financial

⁴ In some cases, the price is calculated as 'Net sales price determined in an Arms-Length Transaction' (SMHL); 'Market Value of mineral determined in an Arms-Length Transaction' (London Mining); 'Market Value' (AML); 'Gross Sales Price ,free alongside the Sierra Leone port of shipment'(Sierra Rutile).

institution valid for an initial twelve months or longer if, by April 2012, the company fails to produce 100,000 tonnes and fails to re-open the Marampa mine. A second letter of credit of \$1 million, valid till 2015, is payable if the company fails to produce at least 200,000 tonnes of iron ore from Phase Two of its operations. In cases where the final price receivable exceeds the initial price on which royalty calculations were made, the difference in royalty would be paid as 'Additional Royalty'.

Royalty is tax deductible for all the companies. It is again clear that some of these companies have successfully negotiated terms not wholly compliant with the provisions made by the Mining and Minerals Act, 2009, which is a bad precedent. The evaluation of monitoring and reporting mechanisms in relation to company imports also highlights the problems faced by the Government in accurately calculating royalty payments due. Royalty payments are expected to be one of the largest sources of mining revenue for the Government and these calculation issues are worrisome, giving rise to potential loss of income.

-Corporate Income Tax and Fiscal Taxes payable:

AML pays corporation tax at the rate of 25 % per annum. SMHL pays at the rate of 30%. SMHL's agreement with the Government also states that in the event that applicable law (Income Tax Act) increases the corporate income tax rate, the company shall pay 30% or applicable law rate, whichever is lower. This 'lower tax' provision is also found in the London Mining agreement. For the first three years, the agreement states that London Mining should pay corporation tax of 6%; 25% between years 4 and 10 and from year 11, and thereafter the company shall pay tax applicable to companies in the Income Tax Act, but not exceeding 30%. In the Sierra Rutile agreement, it is agreed that Sierra Rutile shall pay corporation tax of 37.5% per annum, but this amount should not be less than 3.5% of the amount of the company's annual turnover. However, as per an agreement reached with the Government in 2003, the company's payment of corporation tax is withheld until 2014. Corporate income tax rates that have been agreed upon are not in adherence with the applicable tax rate for mining companies in Sierra Leone, which is 37.5% subject to additional tax on profits. The clause 'the company shall pay income tax at the rate applicable by law but not exceeding 30%' is counterproductive, as the corporation income tax by applicable law in Sierra Leone clearly exceeds 30%. On the re-commencement of income tax payments in 2014, if the changes to the current agreements are not made, from the companies being reviewed, Sierra Rutile would be the only mining company paying the corporate income tax rate for mining companies stipulated by the laws of Sierra Leone. According to the 'Dan Watch' report in 2010, corporate income tax collected in 2010 was just \$2.4 million. Minor taxes for AML, as per its contract with the Government, should not exceed \$25,000 in any financial year or \$100,000 over a 5 year period. Sierra Rutile and London Mining's minor taxes are not to exceed \$100,000 per annum or \$250,000 over a 5 year period. Minor taxes for SMHL shall not exceed \$500,000 over any 5 year period.

All the companies pay immigration fees for their expatriate staff. SRL, LML and SMHL pay payroll taxes at the applicable rate. AML, however, pays payroll taxes not more than \$100 for ECOWAS staff and \$3000 for expatriates. All four companies pay PAYE taxes and make contributions to the national social security insurance trust (NASSIT) in respect of Sierra Leonean workers, but not for their expatriate staff. Apart from this mandatory contribution, to this study's knowledge, the companies do not provide any retirement benefit plan for their indigenous employees. In the case of Botswana, in addition to the mandatory social security payments, Debswana has a pension scheme for its employees.

-Withholding Taxes:

Withholding tax obliges the payer to withhold a certain percentage of payments made as taxes to the Government. AML withholds 5% on dividend payments and management fees. However, the company and nominated contractors shall not be liable to withhold taxes on payments to subcontractors as specified under Section 117 of the Income Tax Act 2000. Sierra Rutile was exempted from withholding tax payments on management fees before 2005, dividends before 2005 and interest before 2011. After the allowance periods, the firm withholds tax not greater than 10% on all dividend, interest and management fees payments. During the first six years of operations, London Mining withholds 5% on dividends, interest, management fees and payments on contracts to non-resident 3rd parties. Between years 6 and year 10, the company withholds 10% on these sets of payments and, from year 11 onwards, the full withholding tax under income tax law is applied. In the case of all independent 3rd party long term contracts, with a minimum value of \$500,000, withholding tax is 5% for the initial duration of the respective contract and full applicable rate is applied thereafter. Payments to local contractors attract 5% withholding tax. Withholding tax arrangements with SMHL is not clearly specified in the upgraded agreement, but, according to this study's research, the company withholds 3% of payments to local contractors.

It is evident that in the case of withholding tax too, there is no uniform rate applied by all the companies under review. These continuous 'tailor made' financial agreements, often in contrast to applicable law, set bad precedence as other companies seeking to enter the Sierra Leonean extractive industry would come with the aim of negotiating deals rather than abiding with existing applicable legislation.

According to the Income Tax Act, the rates of withholding taxes applicable to the mining sector are 15% on interest, 10% on dividends, 10% on rents (e.g. on machinery), 5% on payments to resident contractors and 10% on payments to non-resident contractors. All the companies under review are, at some point during the term of the agreements, in violation of the provisions of the Income Tax Act. Withholding tax on payments to non-resident contractors is the largest source of government income from mining companies. In 2010 alone, withholding tax on payments to non-resident contractors

accounted for 33% of total mines' revenue. This study can only imagine the contribution to revenue if all the companies were abiding by income tax legislation.

-Mining and Surface Rent:

AML has two mining licenses and pays \$500,000 per block annually for each license. SRL, as per the 1989 agreement, pays \$400 per year as mining rent. The updated agreement has made provision for a 5% annual increase of this amount to be payable to the State. London mining pays \$500,000 annually and this amount is subject to adjustment, but not by more than 5% per annum. SMHL pays the annual amount by applicable law. Mining rent is treated as allowable expense for accounting purpose.

Surface rent is paid for prospective damage to crops. The amount of surface rent to be paid annually by AML to land owners is not specified in the agreement. In the LM agreement, the payments to be made by the company are in accordance with the Mines and Minerals Act. Surface rent payable by SMHL shall be determined by the Minister of Mines and Mineral Resources on advice of the minerals advisory board. Sierra Rutile's surface rent payment before 2003 was \$4/ acre per annum and increased in 2003 to \$10/acre per annum. This rate increases by 3% every year thereafter. The rates of surface rent need to be uniform across companies and should be clearly stated in the agreements and bounded by legislation. Discretionary determinations increase the probability of corruption. With respect to land compensation, the legislation itself needs to be amended. The 1996 Minerals Act states that fair and reasonable compensation should be paid at the present market value of the land and this fails to account for the boosted value of the land under mining. 'It is not enough to give "fair market value" for their land and then expect rural, uneducated farmers to begin life anew', (World Bank, 2008).⁵

-Non Tax Revenue:

This category of revenue covers customs and import duties, import inspection fees, port harbour dues and stevedoring charges, fuel and lubricant taxes and road user charges.

-Duty and Tax Exemptions:

For the duration of its agreement with the Government, AML and its subcontractors are exempted from import duties, taxes in respect of mining machinery, plant, equipment and mining consumables. In the case of Sierra Rutile, for the duration of its agreement levies, duties and fees payable by the company in respect of imports of mining equipment, plant and mining consumables will be 5%. The maximum customs and excise duties payable on other Sierra Rutile imports for 1997 to 2003 was 8% of Cost,

⁵ A report commissioned by the World Bank: 'Sierra Leone Mining Sector Reform: A Strategic Environmental and Social Assessment'.

Insurance and Freight (CIF) price. This increased to 10% between 2004 and 2005 and is currently 12% of CIF price.

London Mining is exempted from paying Goods and Services Tax (GST) for the duration of its agreement with the Government of Sierra Leone. The company is liable to pay customs levies and duties for mining machinery and consumables at the rate of 1% of invoice value from 2011 to 2018, 2.5% between 2019 and 2020 and thereafter according to the Customs Act of Sierra Leone. In respect of other company imports, LML should pay customs duties at 20% of the prevailing rate between 2011 and 2015 and thereafter at the prevailing rate determined by the Customs Act. Sierra Mineral Holdings is also exempted from paying GST on all imported capital goods, fuel and lubricants and pays only 5% of the value of imported cargo for the duration of their agreement.

AML is, for the duration of its contract, exempted from paying import inspection fees, port harbour dues, stevedoring charges and road user charges and all its imports of fuel and lubricants are both duty and GST free. AML is only liable to pay safety fees, pilotages fees and charges at ports owned by the Sierra Leone Ports Authority.

All the other companies pay some level of customs duty. SMHL pays customs charges of 5% of the invoiced value of the imported item. It is, however, noted in the agreement that such an amount must not be in excess of charges applicable under ECOWAS Trade liberalisation Scheme (TLS). SRL also pays customs duties at 5% of invoiced value of imports and 1.5% of CIF of the imported goods as inspection fees. In the case of LML, on imports of capital items such as equipment and machinery, between 2001 and 2018 the agreement stipulates that the company pays 1% of invoiced value of the consignment as customs duties. From 2019 to 2020, the rate will increase to 2.5% and the applicable customs tariff will be paid on imports after 2020. On other items, excluding fuel and health and safety equipment, from 2011 to 2015 LML shall pay only 20% of the prevailing rate and thereafter the applicable customs rate. SMHL is expected to pay freight levy of \$0.45 per metric ton of bauxite exported. The obligation to pay freight levy may be transferred from the company to customers to the extent allowed by the Maritime Act. Sierra Rutile pays freight levy at \$1 per ton of rutile and zircon, \$0.25 per ton of ilmenite and \$1.20 per ton of other goods.

The various agreements state that if items on which duties were paid are not re-exported or totally consumed within three years, the companies shall pay the Government the customs import duties on the then fair market value within forty-five days. There are, however, no monitoring mechanisms to decipher cases in which imports are not totally consumed within three years. Therefore, the state could be missing out on much needed revenue. In the case of Botswana, duty free concessions are only granted on machinery and equipment for the purpose of manufacturing and raw materials imported for the sole

reason of producing goods that would be exported, resulting in export revenue and strengthening the country's manufacturing industry.

All the companies can import the whole of their fuel requirements except petrol and kerosene, which they must purchase in Sierra Leone. It has already been stated that AML is exempted from all fuel and lubricant taxes as well as road user charges for the duration of its contract. Sierra Rutile taxes on fuel imports are 8% of CIF from 1997 to 2003, 10% of CIF from 2004 to 2005 and 12% of CIF thereafter. LML pays the applicable customs tariff on its fuel and lubricant imports, but is exempted from road users fuel levy.

This study is of the opinion that the duration of most of these exemptions is too long, especially in the case of AML. If the Government views these exemptions as a last resort to attract these companies, which is definitely not the case, it is more practical to give reduced tariffs, not exemptions, to help only in 'setting up' years. On the other hand, if the large amount of capital that these companies invest in Sierra Leone is taken into consideration, duty exemptions in 'setting up years' is reasonable. However, this research thinks that Goods and Services Tax (GST) exemptions are going a bit overboard. These concessions should also be uniform across the board and made part of the legislation. All the imports are to be used in Sierra Leone and, therefore, such consignments must not be GST free.

-Capital Expenditure Allowances:

All the companies under review are given capital expenditure allowances which are income tax deductible. Qualifying expenditure includes expenditure on all mining machinery, plant, construction equipment, capital expenditure haul roads, and capital expenditure on assets related to the development of community infrastructure. For all the companies, in the first year, 40% of the cost of qualifying capital expenditure is deductible. 20% of the cost is deductible in each additional year until the whole cost is allowed.

This research believes that, given that capital expenditure on community development projects such as the construction or improvement of schools, hospitals, roads and training, is also tax deductible; the construction of such infrastructure could be written into the contracts so that the companies themselves fund such undertakings and reduce the possibility of corruption and misappropriation of funds by local officials.

It is noticeable that all the companies have succeeded in negotiating various self-beneficial rates for themselves, which are, in almost all cases, against the provisions of Sierra Leone customs legislation. In Botswana, capital allowances per year are not as high as in Sierra Leone. Botswana's mining legislation specifies capital allowance of 25% for buildings in the first year and 2.5% annual allowance thereafter. For buildings used in the industrial business, only 2.5 % of cost is allowed yearly. The country's Mining Act allows for not more than 25% capital allowance for machinery and equipment and 10% for plant and

machinery with long life. In comparison with Sierra Leone, it is noticed that much lower capital allowances are allowed per annum, resulting in more chargeable income being available.

The study understands the need for duty discounts, but giving such reduced rates, in most cases for the duration of the mining agreements, results in significant loss of revenue for the state. Reduced rates for setting-up equipment is reasonable, not exceeding two to five years depending on the scale of the company's planned activities.

-Tax Deductibles:

In addition to the already mentioned tax deductible payments, such as royalties, losses and certain capital expenditures, the companies being evaluated in this study also benefit from other tax deductible expenses. This research views some of these tax deductibles as the Government 'selling the economy' for less than it is worth. Yes, certain allowances are necessary to attract foreign investment, but getting the balance right is what seems to be the problem in Sierra Leone. In the case of AML, for example, expenditure on environmental protection and restoration, tertiary and technical training of fulltime Sierra Leonean employees, donations and contributions to the Community Development Fund being tax deductible can be viewed as necessary and growth promoting. On the other hand, this study views the 'no limit expenditure on air tickets for breaks' being tax deductible as crossing the line. SMHL is allowed to deduct expenditure for celebrating company milestones. This is kind of absurd. Office expenses not exceeding 5% of turnover and marketing commissions and fees can be tax deductible for Sierra Rutile. There needs to be careful re-evaluation of the type of expenses that should be tax deductible and make economic sense, especially those not provided for in the legislation (lease and surface rent payments).

Comparing Sierra Leone with Botswana, companies need to meet special conditions to be eligible for tax relief. In the case of Botswana, private expenditure is not tax deductible. Companies applying for tax relief are assessed on the number of Botswana citizens employed; provisions made for the eventual replacement of expatriates with Botswana citizens, especially in management positions; activities stimulating development in other sectors of the economy, mainly industrial or commercial; and the potential of reducing the prices of Botswana's consumer goods. Hence, being a mining company should not automatically guarantee duty free status.

-Treatment of Losses:

Mining companies enjoy certain allowances regarding the treatment of losses for tax purposes. AML is allowed to carry forward losses for up to ten years and there is no limitation on the amount of losses that can be used to offset chargeable income. According to the Sierra Rutile agreement, the company can make a claim requiring that the amount of any loss incurred by the company during the nine financial years prior to December 1999 be offset against profits. Losses thereafter shall also be carried forward as far as can be and deducted or offset against profits or other revenue on which the company is charged

tax in subsequent years. London Mining's loss that would be tax payable between year 1 and 10 will not be less than 15% of the income tax that would be due if no losses were carried forward. After year 10, London Mining's losses would be treated as specified under income tax law.

It is not clearly stated in all the agreements that the Government may appoint an independent firm to verify losses. Giving 'no limitation' on the amount of losses that can be used to offset chargeable income to companies such as AML is rather like giving the company a free ride to tax exemption. Currently, these treatments of losses are in contravention of applicable law. However, the agreements make the following provision: 'if at any time the Income Tax Act allows for a greater utilization of tax losses, the company shall be entitled to take advantage'. There is definitely a clear problem of applying legislation when it comes to mining companies, painting the picture of them receiving preferential treatment to the detriment of the Government's revenue collection efforts.

-Employment and Immigration:

Expatriate staffs of all the companies are given the right to enter, reside and depart from Sierra Leone. The Government has also agreed to facilitate multiple entry visas for business purposes. Until quite recently not much immigration monitoring had been done with regards to renewing work permits and checking whether individuals whose work permits have expired or no longer work for the mining companies to which their permits are tied have left the country. The mining agreements clearly give employment priority to Sierra Leoneans for both skilled and unskilled labour. The companies also should not import unskilled labour. All the companies are expected to train Sierra Leoneans, both on the job and externally, to gradually replace non-executive expatriates with qualified Sierra Leoneans as they become available.

Little monitoring of changes in the amount of Sierra Leoneans being employed and trained has been done in the past. Recent changes to the agreements signed by London Mining and SMHL now require these companies to submit bi-annual human resource reports to the Director of Mines, clearly showing the characteristics of their work force and status of training programs. These reports, however, are also to be shared with the Labour Ministry, Ministry of Education and Department of Immigration. On the other hand, the Sierra Leonean work force was and still is relatively unprepared for the professional and technical needs of the mining industry; most of the literate individuals lack technical skills. The need for technical training institutes, apprenticeships and greater technology transfer cannot be over emphasised.

Developmental Contributions:

-Domestic market promotion:

All the agreements under review stipulate that the companies give preference to equipment, supplies and equipment made in Sierra Leone. The London Mining agreement also specifically requires the company to originate all of its procurement through banking institutions in Sierra Leone. SMHL's contract requires the company to pursue local industry development, such as the production of bricks, ceramics and roofing tiles from the products of its mining operations in Sierra Leone. There are hardly any encouraging reports related to the successful implantation of these requirements. Manufacturing of equipment and supplies for the mining trade in Sierra Leone is negligible. Manufacturing, therefore, needs to be actively promoted for the country to gain from the provisions made for domestic market promotion. Sierra Leonean companies do provide some services, such as customs clearing and logistics services, however there are still foreign companies providing such services, undercutting indigenous firms. The use of Sierra Leonean financial institutions also needs to be stressed.

-Environmental Social Protection and Impact Mitigation Fund and Agricultural Development Fund (ADF):

These funds are managed and controlled by officials of the Ministry of Mineral Resources and the Ministry of Agriculture, Forestry and Food Security (MAFFS). To access the funds, communities write project proposals which they forward to the funding committees through the Paramount Chiefs of their respective Chiefdoms. Sierra Rutile only started making contributions to the ADF fund in 2003. The Sierra Rutile agreement requires the company to pay \$75,000 or 0.1% of 'gross sale along ship side' value of exports, whichever is greater. The company is also restoring mined-out areas. However, NACE reported that there is no evidence of any significant rehabilitation in the rutile mining area at all. London Mining and SMHL are required to prepare and submit to the Environmental Protection Agency a reclamation and rehabilitation master plan for mined-out areas. Again, there is not much publicly available information on the current status of such rehabilitation plans. Hence the need for greater transparency and flow of information.

-Corporate Social Responsibility:

All the companies contribute to a certain level in community development projects. Most of their activities are centred on the provision of scholarships, allowing locals to access their health facilities, small donations to hospitals and the construction of water wells. Details of annual projects are recorded in company reports and summaries are readily available in local newspaper reports. In the contracts signed by London Mining and SMHL, they are required to contribute at least 1% of net sales revenue each year to the Community Development Fund. However, no such clear requirements are included in

the agreements of AML and Sierra Rutile. It should be noted that the contributions to the Community Development Fund are treated as additional royalty and thus tax deductible.

It has been explained before that transparency and inadequate information exchange limits the capability of the Government and the civil society to monitor how projects funded by the Community Development Fund are being implemented. There also needs to be uniformity among the contributions these companies make to the fund. CSR is voluntary, however, given the level of development of many areas in Sierra Leone and how centralised the administration of Government funds is, writing some of the much needed socio-economic contributions into the mining contracts can help ensure tangible contributions to the country's development.

- Reporting and Dispute resolution:

The companies under review are required to provide reports to the Government of Sierra Leone. One of the key reports is the report of company exports. This report should state the quantity of the mineral mined, the grade, the tonnage exported, price, sales payments received, names and designations of consignees and a copy of the export entries certificate signed by the comptroller of customs and excise. This research's point of contention is that the Government does not always have representatives at the point of export. Therefore, calculations of royalty are based solely on reports which the companies' appointed inspection company provides. It is required that the reports be presented to the Director of Mines. This research recommends that copies be also lodged with the Ministry of Finance, the National Revenue Authority, Ministry of Trade and Industry and the National Minerals Agency. SMHL is required, as per terms of its contract, to provide annual audited and unaudited financial statements to the Government. However, this is not included in the agreements of the other companies.

The Ministry of Finance and Economic Develop and AML will jointly review the companies' fiscal packages every five years. The joint review of London Mining's fiscal package will commence in 2020. It is not clear whether Sierra Rutile and SMHL will also be subject to joint reviews. No explanation is provided for the deferment of London Mining's review to 2020. This study is of the opinion that at this 'infant' stage of Sierra Leone's extractive sector, annual reviews are required to help with better monitoring, policy formulation and implementation.

In the case that any dispute arises between any of the companies and the Government, the agreements encourage in house dispute negotiations. However, in cases where the dispute settlement is not reached within three months, arbitrators shall be appointed.

At this stage of the qualitative analysis, it cannot be accurately determined whether H5 is accepted or rejected. This is because the agreements mainly show what is expected to be done on the part of the Government and the mining firms. Company reports and newspaper articles, which will be evaluated in the next section, will show what has been done and will better help to determine whether there is support for H5. The examination of the mining agreements between the four companies under review and the Government of Sierra Leone has, however, highlighted the key expectations of the parties. There is clear evidence that some of the articles of the agreements fail to meet the requirements of related legislation. Some allowances seem to portray the Government as ‘too eager to please’, thus reducing the potential long term benefit to the country, especially in financial terms given mounting external debt. According to the ‘Dan Watch’ report, Sierra Leone’s natural resources can potentially generate approximately \$600 million per annum, but, as at 2010, annual government mining revenue was less than \$25 million, which is surprising because the prices of the minerals exported from the country have, on average, increased over the last five years yet the companies get away with paying little or no taxes.

5.4.2 ANALYSIS OF COMPANY REPORTS:

Sierra Rutile Limited (SRL):

SRL publishes all of the reports which the company wishes to be made public on the company’s website. The various reports published between 2005 and 2012 provide the data used in this part of the analysis. SRL’s reports mainly provide information regarding the changes at the top level management of the company, ownership structure, updates of its operations, financial information and CSR activities.

-Changes in Management

The company provides updates relating to changes at top management. This often relates to the appointments and resignations of non- executive directors and top management staff and appointments to the Board of Directors. This is mainly for the benefit for shareholders and investors. Top quality management often instils confidence in the markets. Currently, a Sierra Leonean, Mr John Sisay, is the company’s C.E.O and the Government still has representatives on the Board of Directors.

-Ownership and shares

In August 2005, the company (then TRG) listed shares on the AIM market⁶ of the London Stock Exchange under the symbol: AIM: TXR.L. The Group had raised US\$74 million (£41 million) before

⁶ Formerly Alternative Investment Market

expenses and, at the Placing Price; the company had a market capitalisation of US\$158 million (£88 million).

Throughout the years, the amount of new shares placed, the price per share, capital raised and purpose of each placement is announced. In May 2007, the company placed new common shares to raise capital for upgrading the power house at the Sierra Rutile mine and the expansion of Sierra Rutile's dry plant capacity. The company raised \$25 million in November 2009 to fund Dredge D3, upgrade Dredge D1 wet processing plant and upgrade the company's land plant via a placing of 151,200,000 new shares at 10 pence. Whenever share options are granted or exercised, especially those by non-executive chairpersons or directors, the company also makes it public knowledge.

It has been shown in the company's agreement with the Government of Sierra Leone that the Government gave up its ownership in the company in exchange for cash settlements payable as additional royalty. According to the company report published on May 8, 2007, as at April 27, 2007, shareholders holding more than 3% of the company's total voting share capital were: Leopard Titanium Ltd, 38.6 %; Morstan Nominees Ltd, 18.2%; N.Y. Nominees Ltd, 10.5 %; and Videos Nominees Ltd, 4.3%. This shareholding changed over the years and as at December 31, 2012, the following shareholders had an interest in 3% or more of the voting capital: Pala Minerals Ltd, 54.41%; M&G Investment Management Ltd, 19.66%; JPMorgan Asset Management Ltd, 8.88%; Neon Liberty Capital Management LLC, 6.45%; Investec Asset Management, 5.10%. This shows that 94.5% of the company's shares with voting rights are foreign held. The Government has no ownership or voting rights.

The company's acquisitions and sales activities are also reported. In December 2005, TRG acquired the Rotifunk mineral sands prospect in Sierra Leone from Gondwana Investments S.A. for \$120 000 cash, payable on completion. Global Aluminium Ltd was sold to Vimetco N.V. for a total cash consideration of US\$40 million in July 2008. If the Government had had a significant shareholding in the company, it would have been bound to benefit from such transactions and the multiplier effect of such gains would have been translated into development and welfare projects.

-Financial Announcements

The financials of the company reported in the Titanium Resources Group Ltd Annual Report, issues 2005 to 2012, reveal the changing financial status of the company. Due to limited production in 2005, the company's 2005 annual report revealed losses of \$13.7 million, which shareholders expected, and cash reserves of US\$79.7 million at the end of the year. In 2006, compared to sales of \$337,000 in 2005, the company recorded sales of US\$51.3 million. These increased sales and a tax credit of \$35.9 million resulted in a post-tax profit of \$34 million. Sales increased to \$67.8 million in 2006. Even though 2008 sales fell to \$49.4 million, revenue from the sale of the bauxite mine to Vimetco for \$40.5 million in cash

resulted in a profit of \$26.6 million. The company's 2010 sales of \$41.1 million was an 11.7% increase on its 2009 sales and \$9.2 million cash was generated from operating activities compared to \$1.8 million in 2009. 2010 was so successful that the company issued a pre-closing trading update revealing that rutile prices increased sharply during 2010, resulting in contract sales prices at between 19% and 25% above 2010 average prices. Notwithstanding, the company experienced an increase in costs due to increased production levels, the outsourcing of security, the implementation of GST in Sierra Leone and the capsize of Dredge D2. 2012 saw a 226% increase in revenue from 2011 and a profit of \$83.5 million with current assets of US\$92.2 million at December 31, 2012.

It is clear that the financial health of the company has improved from year to year and is projected to continue growing. This should translate into increased revenue for the Government, especially in the form of royalties and corporation tax. If the Government had also retained its equity share in the company, dividend payments would have accrued. However, with a host of tax deductibles and exemptions, tax revenue is considerably less than expected and inadequate monitoring of production and sales does not ensure accurate royalty payments.

Apart from the taxes and royalties due to the Government, Sierra Rutile has several other financial arrangements with the state. The Government of Sierra Leone, through the European Union (EU), offered a loan of £24.75 million to the company, the last tranche of which was received in 2005. In 2008, a two year moratorium of interest payments on the EU loan was negotiated with the Government. During the course of 2010, a dispute arose between the Government and SRL over non-payment of certain interest payments on this loan. In October 2010, the company announced that it had reached an agreement in principle to resolve the dispute. Under the terms of the agreement, the Government will invest £13.6 million of the SRL Loan into approximately 113.7 million new ordinary shares, upon which the Government will own 22.8% of Sierra Rutile's enlarged issued share capital. This arrangement will reduce the outstanding debt and accrued interest by 42.2 % to £18.7 million.

This research, however, finds it shocking that, in December 2010, Sierra Rutile published a report explaining that the Government of Sierra Leone had withdrawn its request for the payment by SRL of all accrued interest, plus the accrued balance and capital interest owing on the loan. The report also revealed that, whilst discussions with the Government regarding a potential debt-for-equity swap were ongoing, the Board was also considering a number of other options to reduce the company's outstanding debt level. In 2011, it became clear that the negotiations had ended with a payment plan being agreed upon rather than the debt-for-equity swap. In March 2011, the Government received a payment of \$18.3 million from the firm and amount outstanding was agreed to be paid over the next four years.

The company's decision to choose cash settlement over the debt-for-equity swap reiterates this study's view that the Government has more to gain as a shareholder. In this research's opinion, the acceptance of these terms by the Government shows short sightedness on their part, especially in light of potential

greater income streams that would help alleviate poverty in the country. The financial short-sightedness is confirmed by the trading of previously owned Government shares in Sierra Rutile for cash and pre-payment of PAYE taxes.

-Operational Updates

Sierra Rutile does not limit its reports to financial related information only. The company keeps the public, mainly for the sake of current and potential investors, informed of updates regarding operational updates, production performance, sales and infrastructural developments occurring at the mining site. Key updates include the announcement of the mines proven and probable reserves of 278 million tonnes of ore grading 1.43% and further resources of 185 million tonnes of ore grading at 1.12% recoverable rutile in 2005; the progress on Dredge D2, Dredge D3, power house conversion to Heavy Fuel Oil, feed preparation and dry plant upgrade projects in 2006; the low cost power plant commissioned in 2008, thus improving efficiency by 25%; and the significant reduction in the Gangama Dry Mining project capital costs by over 17%, announced in August 2013.

Quarterly production results and projections are always reported. The effects of changes in foreign exchange rates and commodity prices are also often reported. In February 2011, the company announced that the JORC-compliant Mineral Resource review process for Sierra Rutile Ltd revealed a mineral resource estimate of approximately 600 million tonnes, confirming Sierra Rutile's standing as one of the largest natural rutile deposits in the world.

In July 2008, Dredge D2 at the Sierra Rutile mine capsized and two persons were reported missing following the accident. In the October 2008 company report, it was revealed that this event negatively impacted on company revenues, three non-executive directors resigned and discussions with the company's insurers in relation to claims resulting from the capsizing of Dredge D2 are ongoing. Trading in the company's shares on AIM was suspended until the extent of the impact of the incident on the Company was fully assessed. Trading recommenced in January 2009.

There was a large public outcry regarding employee safety after the dredge collapsed. In response, the Chief Executive, Len Comerford, explained: "We are focusing on the safety and condition of our employees and other workers who were on the dredge and directing our emergency efforts in response to the situation and to the provision of appropriate medical care for the injured." The company also announced that it would establish environmental monitoring in relation to the incident.

-Corporate Social Responsibility Announcements

Since the collapse of the dredge at the company's mining site, there has been a notable increase in Sierra Rutile's efforts in publicising their activities relating to their corporate social responsibility. In the case

of Sierra Leone, this is how the general populace can often directly feel the benefits of a company operating in the country. As the company spreads its good corporate image abroad through company reports and presentations, the local media is also always present at donation ceremonies and often invited to similar goodwill events.

Among the key CSR-related announcements are the company's efforts in improving human capital and availability of employment. In the Sierra Rutile 2010 Report, the enrolment of the first students in the Sierra Rutile Technical Institute, created to teach relevant technical and engineering skills to young people in the communities around the mine site, was announced. The 2012 report revealed that, as at December 2012, the institute had twelve staff and over three hundred students enrolled. This institute has the goal of improving the long-term employment prospects for the people living around the Sierra Rutile community. SRL also reported that its workforce is 95% Sierra Leone nationals and the company is significantly recruiting from the universities in Sierra Leone. The company stressed plans for increasing recruitment of local Sierra Leoneans and lowering its reliance on expatriate workers.

The Sierra Rutile 2009, 2010 and 2011 reports have stressed the progress of the tree planting on former mine works as part of the Darwin Initiative and the company's own projects. In 2010, it was reported that SRL rehabilitated 55 acres of sand tailings and 6 acres of dry mined areas and has plans to develop agribusiness opportunities for local communities. In 2012, 141.1 hectares of disturbed land was said to have been rehabilitated and the aquaculture project for the rehabilitation of mined-out dredge ponds continued in 2012. Despite the 2010 plans of developing agribusiness opportunities for indigenes, the Sierra Rutile Report 2012 still only shows the plans of exploring the agricultural opportunities, but information on the implementation of those plans is yet to be conveyed.

SRL annual reports for the various years provide updates on the company's health initiatives. The Sierra Rutile Clinic mainly treats employees and their families. The company also runs additional weekly clinics to provide basic and emergency public healthcare for the locals in the community. The company also gives updates on its malaria and typhoid eradication intervention programme and its partnership with Non-Governmental Organisations (NGOs), the Mine Workers Union and the National AIDS Secretariat of Sierra Leone to address the prevention of HIV/AIDS.

The Sierra Rutile Foundation was set up in 2006 to finance sustainable community development initiatives. After consultations with representatives from chiefdoms, the foundation and the company itself have, over the years, undertaken some infrastructural construction projects. Examples of such projects include the rehabilitation of old water wells and the construction of new ones with hand pumps; the construction of a resource centre and a radio station in the Imperri chiefdom; the construction of sanitation facilities (latrines) for the Jong, Upper and Lower Banta chiefdoms; construction of a bridge in Bagruwa Chiefdom; rehabilitation of the village court administrative building in Lower Banta

Chiefdom; installation of a radio station in Imperi Chiefdom; and the rehabilitation of police station in Imperi Chiefdom.

In conclusion, with respect to SRL's company reports, the company is very transparent to its shareholders and investors about financial information and information that could impact on the company's share trading values. If such transparency could exist between the company and the Government of Sierra Leone, the contributions to economic growth and development would far exceed current levels.

Sierra Mineral Holdings Limited (SMHL):

This thesis considers the operations of Sierra Mineral Holdings Ltd commencing after its purchase from SRL by Vimetco N.V in July 2008. In the financial year ended December 31, 2007, SML recorded a gross profit of US\$2.4 million. Hence, Vimetco N.V acquired a profitable company. SMHL also publishes company reports on its website. However, only company reports up to 2010 are publicly available at the time of the writing of this thesis.

-Ownership

SMHL, just like SRL, is listed on the London Stock Exchange and posts operational updates on its website for investors. The acquisition of the company in July 2008 for US\$40 million was reported. The company reports that its bauxite mine has a resource base of approximately 31 million tonnes of bauxite. It initiated the operation of its bauxite mines without the support of a contractor, but they had been re-equipped with modern plant, machinery and equipment for the full technological cycle.

-Operational Updates

In the first nine months of 2009, SMHL registered bauxite production of 514,000 tons. In the same period of 2010, the company reported bauxite production of 814,000 tons. 2010 sales of bauxite (net of moisture) were reported to be 963,000 tons, of which 924,000 tons were sent to Alum Tulcea, Vimetco's alumina refinery in Romania. The Sierra Leone mine, therefore, supplies the necessary raw material for aluminium production in Romania by the parent company. In 2011, the company reported that over 1.3 million tons of bauxite was produced. It currently produces around 1.2 million tons per annum for export.

-Financial Updates

SMHL also publishes summary financial statistics. In 2010, SMHL reported losses and did not pay corporate income tax to the Government. The company increased production and profitability in 2011 and made payments of corporate income tax. However, the liable income tax was reduced by the various deductibles the Government has allowed the company. Royalties were the largest payment from the

company to the state, hence the importance of accurate monitoring and reporting of export volumes and value. For 2010, SMHL reported sales of \$ 30 million and 3% royalty amounting to \$ 908,196 was paid to the Government.

-CSR Updates

The company reported that, as at 2010, it employs 350 people and had also established the SMHL Foundation for financing sustainable community development initiatives in the five bauxite mining chiefdoms. The company has not provided any updated information with regards to its post 2010 activities. However, in the next section of this research, this study includes an evaluation of post 2010 activities reported by the local media. There is increased demand for aluminium on the international markets and aluminium prices are on the increase, therefore greater financial returns to both the company and the Government are expected.

African Minerals Limited (AML):

AML, like the already discussed companies, is listed on the AIM of the London Stock Exchange. The Company is currently focused on the development and mining of ‘The Tonkolili Iron Ore Deposit’, one of the largest magnetite deposits in the world, and the mine is expected to last well over sixty years. Among the companies reviewed in this study, it is the only pre-conflict company that maintained its corporate office in Freetown, from mid-1997 through 2002, during the civil strife. The company makes regular announcements regarding changes in top management, changes in shareholdings, financial activities, operational updates, and social contributions.

-Management Changes

Over the years, appointments of Non-Executive Directors, Chief Financial Officer, Independent Non-Executive Directors and the CEO were announced on the company’s website. In addition, any appointments that strengthen the company’s human resources are also reported. In February 2010, AML reported that the JORC review revealed a JORC compliant mineral resource estimate of 10.5 billion tons with the completion of 110,000m of drilling. The estimate was updated to 12.8 billion tons in December 2010.

-Ownership

The company’s equity is held by different parties and as a result of placing and trading, the ratio of holdings changes almost each year. As at May 31, 2013, shareholdings of 2.4% or more of the issued share capital notified to the company were: Black Rock Investment Management, 13.2%; Timis Diamond

Corporation, 12.8%; M&G Investment Management, 12.8%; China Railway Materials Commercial Corporation, 12.5%; Capital Group Companies Incorporated, 7.6%; Franklin Templeton, 5.1%; UBS, 3.9%; Goldman & Co Investment Counsel, 3.6%; JP Morgan Securities Ltd, 3.0%; and Gibril Bangura, 2.4%. The Government has no shareholding in the company and Gibril Bangura is the only Sierra Leonean owning equity in AML. AML also owns 17.9% of Cape Lambert's Marampa Iron Ore Project in Sierra Leone.

-Financial Updates

In February 2005 the company was admitted to the AIM, raising £20 million. It announced the completion of a \$307 million equity raising and the launch of a secured loan facility in November 2005. The completion of the \$417.7 million secured loan facility from Standard Bank was reported in February 2011. By the first quarter of 2011, AML had raised over \$1.1 billion to fully fund Phase I of the project, which entered production in the fourth quarter of 2011. In 2011, the company reported a total payment of \$10 million in direct taxes, indirect taxes and royalties to the Government of Sierra Leone. Of the said amount, \$6.9 million was employee taxes and only \$0.6 million was royalty payments. In February 2012, the company reported a voluntary prepayment of Sierra Leone employee withholding tax of \$20 million, which will be offset against future tax liabilities. The company believed this undertaking would support infrastructure development in the country.

Unlike SRL, AML did not take any loans from the Government of Sierra Leone. The company continued its self-fund raising by successfully arranging a financing package of \$868m in January 2012. At the end of 2012, AML paid \$34.1 million in direct taxes, indirect taxes and royalties to the Government. This payment included \$25.7 million in employee taxes and \$8.4 million in royalties. In March 2012, it completed a \$1.5 billion transaction with Shandong Iron and Steel Group (SISG) in return for a 25% shareholding in the company. This is the largest foreign investment in Sierra Leone so far and the largest single investment by a Chinese state-owned enterprise in Africa. AML reported that a portion of the funds was used to repay the \$417.7 million Standard Bank secured loan facility and that the remainder will mainly be used to accelerate the development of Phase II of the mining project. In November 2012, the company established an additional 'Equipment Finance Credit Facility'.

The company's financial future is relatively safe as it has offtake contracts that guarantee customers for all produce in 2013 and 2014 and strong relationships with a banking group, thus it is able to leverage its resources to guarantee the lowest cost of capital for its projects. This research wishes to point out that, given that royalties make up a small fraction of past payments by AML, the Government should not rely on it as the main source of mining revenue. It needs to carefully re-evaluate the tax allowances that it has granted that severely reduce its revenue collection potential.

-Operational Updates

The company's financial success has foundations in its operational success. AML reports key operational milestones to boost investor confidence and promote the company's corporate image. The company has developed significant port and rail infrastructure to support the operation of its mining project via its subsidiary, African Rail and Port Services (SL) Ltd (ARPS), in which the Government of Sierra Leone has a 10% free carried interest.

In October 2010 the company announced the 'Three Phase Strategy' for the development of the hematite, saprolite and magnetite ore bodies at AML Tonkolili mine. By December 2010, it was reported that Phase 1, a dry process plant, was completed and that stockpiling of ore produce had commenced. The first shipment of iron ore left Sierra Leone in November 2011. During the second quarter of 2013, the company reported achieving its Phase I export target. AML now projects an increase in production and the expansion of the current port facilities at Pepel.

In order to maintain production targets and ensure minimal costs, the company operates with various partners, some of which are institutional shareholders. Key partners include China Railways Materials Commercial Corporation, which has a 12.5% interest in the company, and Shandong Iron and Steel Group, owning a 25% stake in the project. AML has signed a Memorandum of Understanding with China Communications Construction Company to complete final engineering designs for the infrastructure requirements for the Phase II and Phase III expansions of its project and to be appointed as the company's Engineering, Procurement, Construction and Management (EPCM) contractor.

-CSR updates

Whilst maintaining business updates, the company also reports on its CSR activities. As December 31, 2012, the company reported that 84% of people working on the mining project were Sierra Leoneans and that they were making significant strides in attracting and developing skilled Sierra Leoneans across the organisation. The company, in partnership with the Government, has formed a Steering Committee made up of the Minister of Education and colleagues within the Ministry, the Minister of Mines and representatives from African Minerals' sustainability team to address the educational needs of the nation and to seek the assistance from various out-of-country institutes that can offer both in-country and online training. The committee is currently assessing the rebuilding and upgrading of the Magburaka Technical Institute. AML is also training Sierra Leoneans to become train drivers to ensure the eventual transition to a fleet operated by Sierra Leoneans.

AML has reported its contributions to community development projects. The company reported that it had rebuilt the Makari and Makinkiba Schools and had redeveloped the Binkolo Health Clinic and

Marketplace. The reconstruction of water wells and reservoirs were reported to have been approved and other projects, such as the building of the health clinics at Pepel and Bambuna, had begun.

In April 2012, the company reported a protest in a village close to their operations by temporary workers who had been laid off. The protest escalated into a civil disturbance, the police responded and a death was reported. AML carried out discussions with labour leaders, Paramount Chiefs, the police and the Government and as a result, the company negotiated a package of employment benefits that included a wage adjustment, annual pay revisions, union recognition, and the establishment of centres for excellence in teaching technical skills to employees.

The company, like the others already reviewed, is transparent with its shareholders and keeps them regularly updated on key aspects of the company's operation; a benefit that the Government would have enjoyed if it were a shareholder. This research fears that the outcome of the protest in 2012 will instigate similar protests in other communities where indigenes are dissatisfied with the impact of mining companies in their communities.

London Mining Ltd (LML):

London Mining, like the other companies, regularly reports appointments, resignations of directors and other top management staff throughout the year. The company also reports significant changes regarding its shares. Share placing, large sales, exercising of options and resulting changes are always reported throughout the year.

-Operational Updates

For the period ended March 31, 2010, the LM reported that total inferred resource for primary ore body had increased by over 300%. The mid-year 2010 report showed that Phase 1 of the project was on track for first shipment in early 2011. By January 17, 2011, LM reported that the mine's primary resource had increased by 70% and significant new higher grade weathered resources had been discovered.

The company's first shipment of 49,656wmt of iron ore left Freetown for Europe in February 2012 and this shipment was closely followed by two further shipments. Production continued to increase and for the year ending December 31, 2012, the production target for 2012 was exceeded, operating costs were on budget and, in the fourth quarter of that year, reported sales were up by 30% on the previous quarter. In the company's July 19, 2013 report, sales and production volumes doubled in the first six months of 2013. In August 2013, LML revealed that production for 2013 was expected to be at the higher end of

previous estimates. The report also showed that 2012 revenue from the mine was up 246% year on year whilst operating cost was down 18% year on year.

-Financial Updates

LML reports very specific operational updates; however, financial updates are comparatively limited to annual financial statements and key monetary actions. On January 26, 2011, LML announced a five year offtake agreement with the trading house, Glencore International. This agreement, which included a pre-payment facility for up to \$27 million, provided guaranteed offtake and shipping for all Phase 1A production, with the option of extension to Phase 1B. Along the path of ensuring a long term financial future for the project, on January 31, 2011, the company announced the launching of a \$110 million convertible bond, the net proceeds of which were to be used primarily to fund Phase 1 of the iron ore mine development project. The January 2012 equity offering of \$ 90 million was also reported to accelerate the development of the project. On July 30, 2012, LML announced that it had completed a \$110 million royalty transaction with Blackrock World Mining Trust PLC in return for a 2% revenue related royalty payment. The April 11, 2011 report on Phase 2 of the project reported that the feasibility study revealed that expansion of operations to Phase 2 would produce a robust post-tax net present value of \$ 2.2 billion with an internal rate of return of 28.8%. 2012 financials revealed that the mine generated revenues of \$120.6 million and EBITDA of \$20.4 million and the company paid \$10.8 million in royalties, taxes and other fees to the Government that year.

The company's financial operations have not been without incident. On January 16, 2012, LML issued a report concerning Wits Basin Precious Minerals Incorporated's counterclaim in court against the company's action to seek recovery of the repayment of the \$1 million loan (plus interest and costs). Later that year, on June 11, 2012, LML announced that it had reached an agreement with Fraser Turner Ltd in connection with the termination of a consulting agreement and a claim for a 2% revenue-related royalty brought by Fraser Turner over production at the Marampa project.

-CSR Updates

London Mining Ltd, whilst working towards making a profit for its shareholders, reported on some of its social contributions. It reported an overall health and safety performance over 2012, but with one fatality. As at August 22, 2013, there were zero fatalities and lost time injuries for the period January to August 2013. The company's main social contributions were related to education and development of human capital. The company has created scholarship programmes in primary and secondary schools within the local community. The company reported that it was negotiating a Public Private Partnership (PPP) with the German Society for International Co-Operation (GIZ) for an integrated approach towards implementing adult literacy, technical and vocational training programs in Sierra Leone. The company also reported that it was implementing an internship programme for thirty-six university graduates in partnership with the Sierra Leone Youth Commission, UNDP and Restless Development.

On the health and sanitation front, LML reported that it had developed a programme to prevent and treat HIV/AIDS, to be launched sometime in 2013. The company explained that it would continue to support local government in the Community Led Total Sanitation (CLTS) Programme through the construction of wells.

All the companies make efforts to report on their ownerships, issue of shares, sales and acquisitions, operations, financials and social contributions. Most of the time, in this research's opinion, these reports are used to signal to shareholders and prospective investors, so the chances are these reports, especially the CSR related activities, are often skewed to project a positive image of the company.

5.4.3 ANALYSIS OF COMPANY MEDIA ARTICLES

The available company reports have been analysed. Whilst most of the reports do not date very far back, they do provide a very good picture of current happenings and given good indications of the future. Company reports are often skewed towards presenting a favourable public image of the company, especially in attracting investment and keeping share prices high. Local media articles, however, report both the good and bad sides of the company. In the case of Sierra Leone, most of the mining company related studies are centred on production updates and corporate social responsibility. Payments to the Government are rarely reported by the local media. The foreign media, especially mining news websites, report more production and financial updates. In this section, the key sources of information are miningweekly.com, a website reporting mining news (foreign media), and local newspapers in circulation in Sierra Leone.

- Media reports on Sierra Rutile:

Just as the company itself make public reports on key production targets, the foreign media also reports these production milestones. Mining Weekly, an online vendor of news related to the mining industry around the world, reports most of SRL's production numbers. On April 10, 2012, Mining Weekly reported that the company's first-quarter rutile production had increased by 48% and that SRL remained on track to reach its 2012 rutile production guidance of 80000t. In the same month, this outlet revealed that, due to increased demand and higher prices during the first quarter of 2012, SRL reported a cash balance of \$35.1 million at April 5, 2012, compared with the \$10.7-million cash balance at December 31, 2011. Mostly positive production and sales reports were published throughout the year and the financial good health of the company in 2012 was confirmed when, on January 9, 2013, Mining Weekly reported that SRL had testified that for the year 2012 that the production of rutile and ilmenite had increased by 39% and 38% year-on-year respectively.

This outlet reported in March 2012 that the Board of SRL had approved a budget of \$4 million for additional exploration of the SRL licence area because, as early as 2012, less than 20% of the area had been systematically explored. On October 8, 2012, Mining Weekly reported that the feasibility study into the operations of SRL's new large dredge had projected a pre-tax net profit value of \$472-million, a pre-tax internal rate of return of 68% and a payback period of just twelve months. With such profitable projections, this study can only wonder what percentage reached the Government coffers.

In early 2013, Mining Weekly reported that SRL's production during the first quarter of 2013 grew by 21% compared with the first quarter of 2012. The report attributed this increase in part to the company's \$41 million Lanti Dry Mining project. This Lanti mining operation and concentrating plant are both operating in excess of the company's 3.5 million tonnes a year production capability.

It was also reported that SRL had secured a 70 000 t rutile supply agreement with an undisclosed major pigment producer. The company is to supply seven 10000t shipments of rutile, one each quarter, until the end of the contract in December 2014. On April 5, 2013, the news outlet reported that the company's board had approved and implemented a dividend policy to distribute at least 50% of free cash flows to shareholders following capital expenditures, committed future expenditures and the repayment of any borrowings.

It is not clear whether all this information is made available to the Government. It can be seen from the reports that the company's cash balance increases year on. It is also clear from the media reports that this company is operating profitably, has guaranteed future income and, thus, one should expect a greater contribution to the Sierra Leonean economy and that the Government would have stood to earn more revenue if it had retained its ownership in the company.

Many of the reports in the local media over the years about the activities of SRL are limited to acts covered by the firm's corporate social responsibility. After evaluating the reports, this study noticed that most of the good reports reflect donations to education and health and the bad reports are related to unemployment, worker remuneration, damages to the environment and general discontent among the indigenes. Listing these reports by date would make boring reading, therefore reference is made only to the key recent (i.e. 2008 to 2013) newspaper articles.

On October 24 2008, Sierra Leone News reported excerpts from an interview with the Executive Director of the Human Rights Respect Raising Awareness Campaigners (HURRARC) about the operations of SRL. The Director described that the state of affairs in the Rutile community as risky and dangerous. He explained that the company's dredge had reduced a huge proportion of land in the community to the extent that dams overflowed leading to flooding and that the community's drinking waters were polluted by chemicals from the mining operations.

The review of the old mining act and the presentation of the new Mining Act of 2009 to Parliament for ratification drew a lot of attention in the local press. On December 23, 2009, Awoko Newspaper reported that a prominent Freetown lawyer, Mohamed Fofanah, had pointed out that: “The new mining act is good for Sierra Leone, but implementation is the problem”. Awoko Newspaper reported that, in a workshop organised by this prominent lawyer in December 2009, the views that the Executive Director of the HURRARC expressed in 2008 had been confirmed. The Programme Director of Children's Welfare and Community Development (CWADEP) explained that the general rutile mining area was deplorable and there was a huge class gap between the corporate employees and the indigenes of the community. During discussions, the Chairman of the Landowners’ Federation described the ongoing unregulated dumping of waste by the company, land degradation, air and water pollution and the creation of massive unprotected artificial lakes which are responsible for frequent cases of drowning in the area.

The Youth Leader of Imperri Chiefdom, Bonthe District, stressed that the operations of SRL in their locality had made life very difficult for them, noting that they had lost access to their fertile agricultural lands and that one day they would resort to violence if action was not taken to reverse the current trend.

In May 2012, Uhuru News reported that foreign SRL workers were given weekly allowances of \$300 whilst the minimum monthly wage paid to local workers was only 300,000 Leones, which is less than \$100 per month. This grievance over level of pay, alleged ill- treatment and discrimination led to local senior staff of the company embarking on a two- week hunger strike, as was also reported in Politico Newspaper in October 2012. The National Chairman for ‘Campaign for Just Mining’ corroborated most of the allegations made by the workers against the company and described the company as one practicing “corporate apartheid, and corporate arrogance”.

Local news of the activities of SRL is not always bleak. In April 2013, Awareness Times Newspaper reported that the Sierra Rutile Foundation had funded the installation of solar street lights in the Moriba and Mogbwemo areas as these areas were not connected to the national grid. This gesture has improved safety and allowed more night-time commercial activity in these areas.

SRL’s rehousing of families affected by its Lanti mining project was reported by Standard Times in May 2013. The report revealed that the company employed local builders from the village to work on the project in a bid to inject income into the affected communities. The company’s launching of a career development programme was reported in June 2013 by Sierra Media Express. According to the newspaper, company representatives explained that this program would identify Sierra Leonean employees with high potential and train them to eventually take top technical and management positions in the company.

Over the years, several local newspapers have published articles reporting the company’s repairing of roads, rehabilitation of schools, digging of new water wells and repairing old ones, the establishment of

a library, rehabilitation of court barris and markets, the establishment of a banana plantation and the building of a technical institute to train youths.

In August 2013, it was reported that the company was engaged in land rehabilitation and the establishment of fish nursing ponds. However it is worth noting that, in March 2011, Awoko Newspaper reported the shock and dissatisfaction expressed by The Parliamentary Oversight Committee on Mines and Minerals and a Civil Society Coalition on extractives over the appalling environmental condition of mined-out areas, “without proper reclamation of the land” by the company. It was observed that, whilst most of the land had been destroyed as a result of the mining operation, little effort was being made to rehabilitate the mining communities.

It can be seen that there are mixed effects from the company’s mining activities. Two of the main issues are inequality and low wages. This study has also concluded that there are discrepancies between company reports on the extent of activities such as land rehabilitation and the level of rehabilitation that is actually being done.

- Media reports on African Minerals Limited

AML, like SRL, has its key production updates reported mostly in the foreign media. Production forecasts, meeting and breaking of targets are mostly reported. In 2012, the most popular production story featuring in many different media outlets, such as Mining Weekly, The Guardian and Reuter’s website, was the reduction in the company’s 2012 production forecast. It was reported that, citing severe wet weather in Sierra Leone and uncertainty, AML had revised its 2012 forecast downwards twice. As at April 2012, the forecast had been revised from 15 million tons to 10 million tons, which was further reduced to six million tons in August of the same year. This resulted in a 13% drop in the price of the company’s shares.

In May 2012, Reuters reported on the retirement of the company’s CEO after just three years, following the completion of an early stage in its iron-ore project. The outlet stated that analysts at Canaccord Genuity Investment Bank said the departure was "less than ideal", coming , as it did, after recent unrest among workers at the mine and fears that other senior managers who had followed the CEO to Sierra Leone might also retire or resign. News of this retirement and fears of future high flying resignations resulted in AML’s share prices falling by 5.34% that day.

Reuters reported that AML had committed all 2012 and 2013 production to buyers, including the Shandong Iron and Steel group, Standard Bank and commodities trader Glencore, with whom it signed 4.7 million tons a year, five year contract, commencing in 2013.

In spite of the company generating an operating loss of \$41.5 million in 2011 and missing its production target for 2012, Mining Weekly reported in June 2013 that AML had announced that it had exceeded its 20 million tons a year export run rate target and that the mine's processing plants had been consistently operating above target rate since May 1, 2013.

Volatility is not specific to production. AML share prices also fluctuate, especially with news of large investments and appointments. Business Week reported that the company's shares closed up 7.1% when the \$1.5 billion investment accord with Shandong Iron and Steel Group Co. was signed in August 2011. When this acquisition of a 25% stake in the company was finalised in March 2012, Mining Weekly reported the news and stated that, according to the company, this investment would fast-track the development of Phase 2 of its project while enabling a payment of \$418 million of secured debt.

Some media outlets, such as Reuters, report detailed financial updates on the company. They specifically follow how the company manages its debt and financing options. Reuters reported that the company's operating loss of \$41.5 million for 2011 primarily consisted of employee costs, travel costs of \$28.5 million and share-based payments of \$16.5 million. It is also worth noting that, in spite of the company generating an operating loss, it still made share-based payments, providing support for this study's recommendation that the Government should be a shareholder in all such companies operating in Sierra Leone. Companies always seek to please their shareholders. In August 2011, Reuters reported that the Bermuda-registered company, not covered by the United Kingdom's Takeover Code, had asked shareholders to vote on increasing its takeover protection, especially since shares in the company had risen by about 30%.

It will be recalled from the AML mining agreement with the Government, that airline ticket costs are tax deductible. Therefore, with deductible travel costs of \$28.5 million and an operating loss in 2011, the Government received no corporation tax payment from AML that year and will continue to not receive any until the company reports a profit. The \$868 million refinancing package, including a \$350-million convertible bond which the company finalised in February 2012, was reported to reduce the average cost of the company's remaining debt down to about 8.3%.

Local media, as explained earlier, mostly report activities related to mining companies' socio-economic contributions. On December 24, 2008, Cotton Tree News reported that AML and local authorities of the Port Loko district had signed a contract for the use of the Pepel Rails and Port in the district. At the signing ceremony, a payment of 180 million Leones (\$ 41,860) was made as surface rent to the land owners. In the course of the year, various newspapers, including the Standard Times, announced AML's provision of scholarships for primary and secondary school students. The beneficiaries mostly lived in and close to the company's operational areas. On February 20, 2013, Newstime Africa reported that AML had revised part of its corporate social responsibilities to improve the capacity and skills of the youth,

assist in technical development of workshops and instructional resources and to produce graduate mining engineers for the mining community. The company continued its commitment to improving the country's human capital by establishing a Talent Development Steering Committee to empower qualified Sierra Leoneans and reduce the number of expatriate employees, according to a report in Africa Young Voices newspaper in May 2013. The newspaper also pointed out that the company would be upgrading the Magburaka Government Technical Institute and making arrangements for the establishment of partnership programs between the institute and similar colleges around the world.

The relationship AML and the local community has not been and is not always rosy. The company's first shipment of iron ore from Sierra Leone was met with protests in Makeni and the police had to be called in. Demotix reported that the protest was based on fears of perceived exploitation of the country amidst persistent poverty and unemployment. A little over a year later, in April 2012, news of two days of rioting over pay by workers from AML was reported in almost all the local newspapers and the international press. The riot reportedly started out as a protest over wages and working conditions as the strikers claimed that foreign workers received preferential salaries and treatment. There were fatalities and many injuries. Three weeks after the strike, newspapers reported that AML had announced a 400% salary hike for local workers and that contractors who were owed by the company would be paid. This research believes that is an indication how low initial salaries were and also the potential conflict that might arise as a result of inequitable distribution of mining wealth.

Several months after the strike and the community's return to relative calm, Sierra Leone Daily Mail reported that the General Manager of AML had complained of bad attitudes, lethargy to work, aggression to foreign staff and demand for astronomical wages by local employees. He also discredited claims of poor working conditions and labelled the workers that rioted as inflexible workers who were bad examples. He also claimed that local traders inflated the prices of basic goods and services as a result of the company's presence in the region.

- **Media Reports on London Mining**

The media reports on London Mining, like all the other companies reviewed so far, are often limited to key production highlights, a few financials and activities embedded in their corporate social responsibility. The first shipment of iron ore from LML was reported in Mining Weekly in February 2012. The report also revealed that, according to LML, two more shipments of iron ore had been ordered to be sent to China, where a premium price was expected to be realised. In April 2012, the same outlet also reported that LML's 1.5 million tons a year processing plant was set to evolve into a five million tons a year plant by 2014. On January 24, 2013, Mining Weekly reported that the company had beaten its 2012 production target owing to a 46% increase in quarterly production at the company's mine and the

upgraded floating offshore shipping platform. In May 2013, the same outlet reported that, during the first quarter of 2013, LML achieved record production and sales volumes. There was more than 220% growth in production and 52% increase in sales, compared with the first quarter of 2012.

On the financial front, on January 16, 2012, Mining Weekly reported the \$650 million lawsuit filed against the company by its joint venture partner in China Global Mining Resources Ltd, Wits Basin Precious Minerals. The lawsuit was a counterclaim against LML's action to seek the repayment of a \$1 million loan, including interest and costs, which Wits Basin stated was not yet due. In a statement, LML said that it believed that the counterclaim was "merely a tactic" to avoid the repayment of the loan. In this regard, on February 11, 2013, Business Wire reported that both companies had ended the joint venture by mutual agreement. Wits Basin retained 50.1 % of the shares and the remaining 49.9 % were used to fund the litigation.

On March 29, 2012, Mining Weekly reported that LML was now fully funded to boost capacity at its mine. This came as the company signed a \$45-million offtake-related prepayment loan agreement with energy trading company Vitol and an offtake agreement with Glencore, including a \$27 million prepayment facility. On August 23, 2012, Mining Weekly reported that, for the first six months ended June 2012, LML had posted a profit of \$13.1 million in earnings before interest, taxes, depreciation and amortisation (EBITDA), up from a loss of \$7.1 million in 2011. The company also received \$110 million from Blackrock financing in August 2012 whereby Blackrock would receive a 2% revenue-related royalty calculated on any iron-ore sales from the company over the life of mine.

As already explained, local newspapers mostly report CSR related activities. The company's social relationship had a rocky start. A few days following the confirmation of iron ore deposits in Port Loko, Awareness Times Newspaper reported that youths in the locality of the ore deposits had executed a massive riot that resulted in dozens of arrests. Even though, during a two hour long debate organised by BBC Media Action in July 2007, the company had been reported as having made some form of tangible social contributions in the form of donations for the residents of the community where the company's operations were based, as per the article published by Politico Newspaper, hundreds of residents said they had had no benefit whatsoever from the company's activities. According to the report, less than twenty people stated that the minerals in the community had been of benefit to them. The key areas of discontentment regarding the company's activities that were cited included marginalisation in the area of employment, flooding, displacement, menial jobs and girls dropping out of school owing to prostitution. The Minister of Presidential and Public Affairs in Sierra Leone commented on the huge imbalance in pay structure between foreign and Sierra Leonean employees. He said that even though only about 10% of staff of LML were foreigners, the combined salaries of the local 90% did not come anywhere close to the combined salaries of their foreign counterparts.

-Media Reports on Sierra Mineral Holdings Limited

There are hardly any reports on the activities of Sierra Mineral Holdings in the local media. The company also does not seem to be making much contribution in terms of CSR to the local community. To this study's knowledge, the most common story circulating in the local press regarding this company started in August 2013 regarding the non-payment of outstanding monies owed to local contractors. All of the most widely circulated newspapers reported on this issue. The company is alleged to owe Sierra Leonean companies about \$11.5 million for services ranging from transportation, fuel, lubricant supplies and heavy machine hire, with some of the invoices dating as far back as 2010. The reports revealed that the company's management had threatened to file for bankruptcy if suppliers went to court to file and demand payment. A few of the newspapers alleged that Alro, the parent company's Romanian operations, was also said to be paying SMHL \$28 per ton of bauxite instead of the world market value of around \$58 per ton and upwards, thus, over the years, causing the company to be operating at a loss, hence their inability to pay their service providers and salaries. A few also reported that the company did not want to pay because they believed that they had the support of the Government and explained that this was because the firm had hired the law chambers of Frank Kargbo, Sierra Leone's Attorney-General, as their legal representatives.

5.5 TRIANGULATING THE RESULTS

Hypothesis Five: The estimation results and the qualitative findings reveal that natural resources lead to economic development in Sierra Leone. In order to assess whether Hypothesis Five is accepted or rejected, this research will triangulate the empirical and qualitative results in three stages. Firstly, the empirical results from the PLS model estimated presented in section 5.2 are compared with the mining agreements. The mining contracts reviewed in section 5.4.1 do not provide information regarding the activities of households and expectations of indigenes. Therefore, Hypothesis Three, which tests whether the activities of households result in development in Sierra Leone, and Hypothesis Four, which tests the impact of expectations on the activities of the Government and the firms, are not accounted for by the mining contracts. An assessment of the link between the empirical results and company reports is then carried out. Finally, empirical results and findings from newspaper articles are compared.

5.5 .1 EMPIRICAL RESULTS AND MINING AGREEMENTS

-The African Minerals Sample:

Hypothesis One seeks to test whether the Government's activities, including debt servicing, lead to development in Sierra Leone. For the mining industry, the two strong paths by which the Government

can ensure development aimed activities are through the implementation of mining legislation and prudent spending of resource rents. The African Minerals model showed that government activities failed to have a significant positive impact on development in Sierra Leone, but had a positive significant impact on the firm. These relationships are supported by the terms of the mining agreement between AML and the Government. AML benefits from many tax concessions, to the advantage of the company but at the detriment of the country. It has been shown that the company pays corporation tax of 25%, which is 12.5 % less than the rate required by law. Even though it pays royalty, which is tax deductible at rate of 3%, there is no performance bond provision, which can be used in forecasting revenue, to guarantee it meets production targets and that the State is assured a certain amount of money. AML enjoys exemptions from all import duties in respect of mining machinery, equipment and parts for the duration of its contract. There is also no limit on the amount of loss that the company can offset against chargeable income. Royalty payments should not be depended on as the key source of mining revenue. With all these tax exemptions, much needed revenue that could have been used to fill the country's foreign exchange gap and fiscal imbalance is lost and the Government is still on the borrowing and repayment of external debt path, resulting in negative impact on development. With deficit financing, not much of the Government budget is allocated to welfare spending, hence the significant negative impact on households. Hypothesis Two concerns the mining firms' contribution to development in Sierra Leone. The African Minerals model showed that the company has a significant negative impact on development and a significant positive impact on the household. This shows that the donations of medicines, renovation of schools and training of Sierra Leoneans that the company is engaged in within its corporate social responsibility only positively affect parties that directly receive these donations and training. Since CSR is voluntary, it is possible that the company does the least it can afford. The negotiated tax deals in addition to the level of CSR provide support for significant negative impact of the firm on development.

-The London Mining Model:

In the London Mining model, the Government's significant positive impact of the on development in Sierra Leone is revealed based on the London Mining sample. The model also revealed a significant positive influence of the Government on the firm. However, a significant negative impact on households was also shown. Hypothesis Two was rejected with respect to the company's significant negative impact on development. The results, however, also showed that London Mining has a significant positive impact on the household.

These positive effects of the Government on development and the firm have foundations in the adjusted terms of the LML agreement. Just like African Minerals Ltd, London Mining Ltd has successfully negotiated its own tax deals with the Government. However, in comparison with import duties and related charges, LML's concessions are much lower. The company does not have a blanket duty free concession

for the duration of its contract, but has a deal in which payable duty increases progressively until the company pays the full customs duty on its imports as required by applicable law. As at 2013 up to 2018, import duties payable by the company is 1% of the invoiced value of the consignment. This increases to 2.5% from 2019 to 2020, and applicable law applies thereafter. The company pays royalty on sales and has a Performance Bond agreement with the Government which becomes payable in instances when it fails to meet production targets. However, the company still enjoys GST exemptions and lower corporation tax rates. Therefore, it can be concluded that these relatively more stringent financial arrangements have resulted in more Government revenue, but still less than required by Sierra Leone's mining legislation and, hence, are advantageous to the company. The agreement required the company to make contributions to the Community Development Fund and also undertake voluntary CSR activities. However these provisions have failed to result in positive household effects.

-The Sierra Rutile Model:

Similar to the London Mining model, the Sierra Rutile model also showed a significant positive impact of the Government on development and the firm, but it also showed an insignificant negative impact on the household. In contrast to the results of both the African Minerals and London Mining models, the results of this model indicate that Sierra Rutile has a significant positive bearing on development and a significant positive impact on the household. This could be due to the fact that, compared to the two previously discussed companies, Sierra Rutile has been in operation the longest and its agreement with the Government comes the closest to agreeing to terms almost in line with applicable law. The company does not have blanket duty concessions, but pays a reduced rate and has provisions for increases until the full rate required by the legislation is paid. Historically, the company has made royalty payments (4%) at a rate higher than that required by law (3%). It must not, however, be forgotten that both the Government and the company have reached an agreement that royalty payments be suspended until 2014. The insignificant negative impact on the household shows that the company is implementing the terms of the agreement aimed at the promotion of benefits for Sierra Leoneans, but there is room for improvement. Some of these terms include employment priority for Sierra Leoneans and the training of Sierra Leoneans to gradually replace expatriates. The company also makes payments to the Community Development Fund and engages in CSR activities and has provided detailed plans for its contribution to the environment's rehabilitation.

-The Sierra Minerals Holdings Limited Model

Hypothesis One, which seeks to test whether the Government's activities lead to development in Sierra Leone is accepted in the Sierra Minerals Holding model. From the model, it is evident that the Government has a significant positive impact on development, the household and the firm. Hypothesis Two, testing the mining firms' contribution to development in Sierra Leone, was also accepted as the

results revealed that the company has a significant positive impact on both the household and development. The mining agreement reached between SMHL and the Government does not allow blanket duty free concessions, but only a discounted rate. The company also pays the highest corporation tax (30%) in comparison to the other three companies, but still benefits from GST exemptions. The company also pays royalty at the required rate and its agreement also makes provision for the development of local manufacturing, employment of Sierra Leoneans, community development and environmental rehabilitation.

- The Total Sample Model

At a national level, the Total Sample model showed that the Government has a significant negative impact on development and significant positive impacts on the firm and the household. The significant positive impact on firms can be inferred from the large scale duty concessions, GST exemptions, tax discounts and exemptions, capital allowances, tax deductible activities and a too liberal treatment of company losses. The Government may appoint an audit firm to audit mining companies, but there is no report of it having ever been done. The positive household impact can be based on provisions in the agreements for promoting Sierra Leonean employment and training, subsequent replacement of expatriates by Sierra Leoneans, required contributions to the Community Development Fund and the Environment Development Fund. Apart from the required contributions that the companies make to the Community Development Fund, there are no clauses in the agreements regarding specific developmental contributions that these companies should make, especially with regards to improving the infrastructure of the country.

The African Minerals Ltd and the London Mining Ltd agreements made provisions for joint reviews with The Ministry of Finance and Economic Development. During the interview conducted with a member of staff from the Ministry, it was revealed to the author that not much in terms of in-depth reviews of the companies had already been done. The researcher was, however, informed that an 'Extractive Industries Revenue Taskforce' had been initiated to monitor and forecast revenues and to help improve on transparency within the mining sector. The respondent was, however, not aware that the review of London Mining's fiscal package had been agreed to commence in 2020 and could not provide any reasoning on the part for the Government for not clearly requiring such reviews at more regular intervals. It was also not clear whether Sierra Rutile and SMHL would be subject to joint reviews as well. The official also commented that some form of unreported bribery, lobbying and short-sighted forecasting had been practiced behind the scenes; resulting in some of the companies receiving such high levels of exemptions compared to others and suggested a review of the agreements. From the respondent's answers to questions and a brief update of the state of government finances, the author's personal observation is

that the Government is desperate for cash injections against its rising borrowing from external sources, hence the high probability of it accepting immediate cash settlements rather than equity.

5.5.2 EMPIRICAL RESULTS AND COMPANY REPORTS

Most of these mining companies use production, sales and operations updates as some sort of indicators through which the financial health of the company can be assumed, given a market of incomplete information. All the companies reviewed in their publicly available company reports provide updates on major production, sales and operations updates. They also report financial issues, most often relating to trading of their shares, changes in ownership structure and fund raising efforts and results. It must be noted that the information provided in the company reports are mostly for the information of current and potential investors, as some form of ‘signalling’ on the part of the companies. The Government has no influence on what the companies publish in their reports and, from interviews conducted by the author of this thesis, relevant staff, such as those attached to the National Revenue Authority, Ministry of Mines and Ministry of Finance, do not actually read the company reports published by these companies on their company websites. Instead, they rely mostly on information submitted to them based on the reporting requirements set out in the mining agreements. Therefore, in the case of Sierra Leone, it might seem at first glance that company reports do not have much connotation with Hypothesis One, which seeks to test whether government activities lead to development in Sierra Leone. However, it is the author’s belief that analysis of reports can help with better monitoring of companies, especially with differences between financials reported in company reports and those submitted to the Government.

-African Minerals Limited Model

The lack of adequate monitoring on the part of the Government can be linked to the African Minerals model, revealing that government activities failed to have a significant positive impact on households and development in Sierra Leone whilst having a positive significant impact on the firm. African Minerals company reports revealed that only one Sierra Leonean had an equity share in the company (2.4%). The company also reported its successful fund raising activities, the trading of its shares on the AIM and production ‘take-off’ contracts. Hypothesis Two, which tests the mining firms’ contribution to development in Sierra Leone, was rejected when the results of the AML model presented that the company had a significant negative impact on development but a significant positive impact on the household. This negative developmental impact can be seen from the information that, even with successful funding and guaranteed take-off contracts, most of the payments made to Government comprise of direct and indirect taxes with royalty only a small fraction of the total.

The significant impact positive impact on the household lies in the reported workforce being 84% Sierra Leonean. The company reported that was making giant strides in educating and training the Sierra Leonean work force. It has formed a Joint Steering Committee with the Ministry of Education to foster efforts of training Sierra Leoneans in Sierra Leonean universities and also at foreign institutes. The company also reported that it was actively recruiting from the country's two largest universities, Fourah Bay College and Njala University. This shows that the significance of the Human Capital Theory of the resource curse is widely acknowledged in Sierra Leone. AML informed the public of the riot carried out by some members of staff and their families that occurred in one of the communities and, following the riot about the level of wages, the company made certain pay increases to the indigenes. During the visit to the communities where AML's mining activities are concentrated and where the questionnaires were administered, the author observed that a large proportion of the African Minerals workforce are indeed Sierra Leoneans. The company's wage increase was also well-received by the community. The infrastructure of the communities is better developed than in the communities of the other companies. However, some locals and the author are of the opinion that the improvements in the infrastructure are as a result of Government spending in the area, because it is the home town of the current President, Dr. Ernest Bai Koroma. During an interview with one of the women's leaders in the community, she revealed that, because AML has a Sierra Leonean, Gibril Bangura, as one of its shareholders, in her words, it is "because of Fadika (Gibril Bangura) that African Minerals feels pity for the people of Sierra Leone and is trying to help the poor people out".

-The London Mining Limited Model

The London Mining model showed that government activities have a significant bearing on development in Sierra Leone. The model also revealed a significant positive influence of the Government on the firm. However, a significant negative impact of the Government on households was shown. In the case of Hypothesis Two, London Mining, as in the case of African Minerals, is shown to have a significant negative impact on development and a significant positive impact on the household. As explained in the case of African Minerals, the firm is mainly foreign owned and makes available to the public information about significant shareholding changes, production and operations updates, financing options and off-take agreements. The company also reports on its CSR. Most of the time, updates reveal improvements in the health and safety record at its mine, technical training of staff, scholarships to primary and secondary school children living in the local community, health initiatives like HIV sensitisation programs and construction of water wells.

-The Sierra Rutile Limited Model

In the Sierra Rutile model, Hypothesis One was accepted as the results of the model indicated a significant positive impact of the Government on development and the firm. The results also showed that the Government has an insignificant negative impact on the household. For the case of Sierra Rutile, Hypothesis Two, which tests the mining firms' contribution to development in Sierra Leone, was accepted as the company was shown to have significant positive bearing on development and the household. Among the usual reports of fund raising, major shareholding changes, sales and production milestones, the company reported about a loan from the Government of Sierra Leone through the European Union. However, despite increasing production and sales, reduced royalty payments and tax discounts, the company has a poor repayment record, which led to a dispute with the Government. Surprisingly, but re-emphasising the author's conviction of the short-sightedness of the Government and its desperation for cash injections, repayment negotiations, which at one stage involved the Government swapping the outstanding debt for equity in the company, ended up with a payment plan being agreed. This research discovered that the debt has still not yet been completely repaid whilst the company's profits have continued to rise. It is arrangements such as this that limit the degree of positive effect that the Government and the firm could have on households and development as a whole.

The company's reports mostly contain positive CSR reports linked to education, training, land rehabilitation, fish farm creations, health and sanitation initiatives. The only negative report concerned the dredge that capsized at the mining site, resulting in a fatality and a temporary fall in the value of its shares. This study does not dispute the fact that the company is making some social contributions. However, during the author's visit to the mining community, the actual contributions, such as amount of land rehabilitated, fish farms created, and number of Sierra Leoneans employed, are not quite as significant as one is led to believe by reading the company reports. In the Sierra Rutile company presentation of June 2013, rehabilitation works were reported to be worth over \$1.5million annually. However, during the visit to the rutile community, observation and interaction by the author with the locals did not reveal \$1.5 million per year worth of construction, rehabilitation and health works. It is this research's opinion that the value of such development initiatives is overvalued for the sake of investors and promoting a better corporate profile.

-The Sierra Minerals Holding Limited Model

The results of the Sierra Minerals Holding model also presented evidence of a significant positive impact of the Government on development, the household and the firm. The estimations from the SMHL sample also failed to reject Hypothesis Two. SMHL, owned by Vimetco, was a profitable firm at the time it was

acquired from Titanium Resource Group in 2008. However, two years later, the company made a loss and did not make any income tax payments to the Government and only royalty payments were made. The company makes public production updates and some summary financial statistics. Unlike the other three companies under review, SMHL does not provide updates about top management or fund raising activities. From 2010 up to September 2013, the company has not made public any further reports regarding its operations on its website. Surprisingly, the company's reports on CSR activities are also minimal.

One would definitely be tempted ask why then is there a significant positive impact of the firm on development and households. From the author's observation and the response of a traditional leader, a youth leader and a women's group leader selected from the mining villages where SMHL operates, there is a sense of 'acceptance'. The people in the communities where the operations of SMHL are located have accepted their level of poverty and do not exhibit high levels of positive expectations. The traditional leader explained that the company only makes contributions it feels like making. In most cases it is the bare minimum and the Government has never sent officials to their locality to observe their standard of living amidst the company's operations. The women's leader explained that they, the local people, are not educated or skilled in any mining-related job, hence, in her opinion, they themselves are responsible for their current predicament and SMHL cannot do anything about it. She emphasised, however, that the younger generation could be trained in technical areas so that in the future they could be employed in jobs other than as menial labourers.

5.5.3 EMPIRICAL RESULTS AND MEDIA ARTICLES

Media articles are, in most cases, post-event reportage. They, therefore, are not significant determinants on the impact of the Government, mining firms or households on development. However, they help influence the expectations locals form about the activities of the Government and the firms. Most of the time, it is the foreign media that reports on production milestones, sales figures, funding arrangements and appointments. The local media reports are often mainly limited to reports on CSR activities. These media reports, in most cases, do not account for government activities, but mostly the impact of the firms.

-The African Minerals Limited Model

The results of the African Minerals model showed that the company has a significant negative impact on development and a significant positive impact on the household. Proof of this negative impact on development can be seen in local riots over export shipments and the need for strikes over the level of salaries, resulting in a 400% salary hike. This study can only imagine how low initial wages were that the company could agree to and offer such a large percentage increase. Local media reports of payments

of surface rents, scholarships, training and rehabilitation of schools and institutes show how the positive impact the company has on households comes about.

The author interviewed a member of staff at African Minerals. The manager complained that some of the indigenes had a lethargic attitude towards work. The official stressed that, due to income differences and unequal standards of living, some workers exhibited bad attitudes towards expatriate staff and some demanded astronomical wages. Compared to the communities where the other mining companies under review operate, the infrastructure of the AML communities is better. The researcher also observed that a high level of high school leavers move to seek employment at the mines as labourers rather than pursuing further education.

-The London Mining Limited Model

The results of the London Mining model revealed that the company has a significant negative impact on development and a significant positive impact on the household. The negative reports concerning the activities of the company outweigh the positive reports. This can be viewed as an indicator of the negative bearing that this firm has on economic development in Sierra Leone. The local media reported that riots broke out on confirmation of deposits. The high school dropout rate observed in the African Minerals community was also observed in the London Mining community. The author also observed some form of inflated prices. When questioned, one of the traders explained that inflating the prices of certain goods to sell to employees of London Mining Ltd is the only chance of them reaping benefits from the mining activities in the community.

-The Sierra Rutile Limited Model

The results from the estimation of the Sierra Rutile model indicate that Sierra Rutile has a significant positive bearing on development and a significant positive impact on the household. SRL has been in operation for the longest amount of time compared to the other companies. The foreign media reports about the firm's sales targets, production milestones, shareholding changes and financials and off-take agreements. Off-take agreements guarantee royalty payments to the Government. The local newspapers publish articles concerning donations made by the firm towards health, sanitation and education. As is often the case, on the other hand, HURRARC reported about overflowing dams, flooding, improper disposal of waste and contamination of drinking water. CWADEP also highlighted the deplorable conditions in which the local people live and the huge inequality in the wages paid to expatriates and to nationals.

The author can confirm both the negative and positive reports as the evidence was clearly visible during the visit to Sierra Rutile. In a conversation with some of the youths, a high level of dissatisfaction was observed. Some even made reference to the fact that it was such poor standards of living and inequitable

distribution of diamond wealth that resulted in the 11 year civil war. They said that if the Government fails to actually help change the current state of affairs, they would be left with no other option than to go on riots and organise strike actions.

-The Sierra Minerals Holding Limited Model

The Sierra Minerals Holding model estimation results showed that the company has a significant positive impact on both the household and development. Unlike the other companies considered in this study, there are not many reports in the media concerning its activities. There are a few reports of donations made towards education and small scale construction projects in its area of operations. The most recent report in the local media concerning its activities is that the company owes local contractors approximately \$11million for services related to transportation, local supplies and clearing and forwarding services. Despite this negative turn of events, it shows that the company does indeed use local businesses to provide services and certain goods and the multiplier effect of such transactions results in positive impacts on both households and development. When a member of staff was quizzed by the author regarding this report of non-payment, it was revealed that the company is facing financial issues. He explained that the produce of the mine in Sierra Leone is solely for the purpose of supplying the parent company in Romania. According to him, the parent company pays less than the market price to the subsidiary, SMHL; hence the company struggles to keep up with payments. During the author's visit to the SMHL community, riots were ongoing over the non-payment of surface rents. This off-take agreement with the parent company, Vimetco, paying less than the market price for bauxite, does not only have repercussions for the SMHL, it also transmits into lower royalty revenue for the Government and lost income in terms of taxes.

-The Total Sample Model

On the whole, the Total Sample model showed that, at national level, the Government has a significant negative impact on development and significant positive impacts on the firm and the household and that firms have a positive significant effect on the households but an insignificant positive impact on development. The analysis of the qualitative data also confirms these results. Hence, from the estimation results and the qualitative findings, this research failed to accept the null hypothesis of Hypothesis Five. Currently, natural resources do not lead to economic development in Sierra Leone at a significant level.

Two weeks after topping Transparency International's (TI) list of most corrupt countries, the Multidimensional Poverty Index (MPI) ranked Sierra Leone as the poorest country in the world, even though it had recently being described as one of the fastest growing economies in West Africa.

According to the MPI report, education, water supply, electricity, roads and health delivery are very bad in Sierra Leone, coupled with the low salaries.

The results of the Structural Equation model estimated for the total sample in Chapter Five revealed that, in line with the empirical findings in Chapter Four, the perceptions of Sierra Leoneans confirm the existence of a debt overhang-resource curse in Sierra Leone. Apart from the Debt Overhang Theory, the Quality of Institutions, Conflict, Rational Expectations, Human Capital and Rentier theories also provide some explanation for the lagging growth experience by the country.

In 2010, the mining industry accounted for almost 60% of exports (US\$200 million), but only 8% (US\$24 million) of government revenue came from the mining sector. Despite increasing global mineral prices, mining companies in Sierra Leone hardly declare any profits. Government revenue from mining accounted for only 1.1% of GDP (NACE Report, 2009)⁷. The Government's finances are under massive strain due to misguided borrowing and spending, and this has left the Government with a budget deficit.

The analysis of the mining agreements signed by the four mining companies reviewed in this paper revealed that they have successfully negotiated agreements more beneficial to themselves than the country to keep their payments to the Government of Sierra Leone low. The contracts are not in accordance with the Mines and Minerals Act of 2009 and the Income Tax Act of 2000.

The company reports revealed that the companies' main aim is to send positive signals to shareholders and potential investors. Ownership information, operation updates, financials and social contributions are the main transmission channels. The financial updates revealed that tax payments to the Government are minimal.

The international media articles mostly report what the companies publish in their annual reports and on their websites. It is only the local media that stress the adverse effects of mining activities on the socio-economic lives of Sierra Leoneans. Besides the limited economic contribution because of the poor levels of revenue generated by the government from mining, mining impacts adversely on local communities and the environment.

Sierra Leone has difficulties in managing the extractive industry. Poor governance, corruption and the lack of human capacity to monitor and evaluate the operations and performance of foreign companies operating in the country provide the foundation for less than expected growth and development.

⁷ National Advocacy Coalition On Extractives (NACE): Sierra Leone at the crossroads: Seizing the chance to benefit from mining; March 2009.

The state of affairs that can be deduced from the results of the survey, mining agreements, company reports, newspaper articles, interviews and the author's observations provides further support for the debt overhang- resource curse hypothesis in Sierra Leone.

CHAPTER SIX

THESIS CONCLUSION AND RECOMMENDATIONS

All the empirical and qualitative investigation of the debt overhang- resource curse hypothesis has been done. The examination started with a panel data analysis of 153 countries between 1970 and 2011. This was followed by a time series SVAR analysis of the Sierra Leone experience for the same time period. This thesis continued by carrying out a perceptions-based study to evaluate whether the findings regarding the link shared by debt overhang, natural resources and growth in Sierra Leone, from secondary data mainly collected by international organisations, are corroborated by the perceptions of Sierra Leoneans. The inquiry continued with an analysis of the mining agreements signed with the Government by the four largest mining companies operating in the country, the reports these companies have made publicly available over the years and the articles that have been printed in the media regarding their activities in Sierra Leone. The findings from the GMM estimation, the SVAR estimation, the perceptions analysis and documents analysis were then compared. The conclusion reached is reported in the next section followed by the author's recommendations on how Sierra Leone can better benefit from its natural resource endowment.

6.1 THESIS CONCLUSION

The examination of the relationship between debt overhang, natural resources and growth has unfolded through the three main studies of this thesis. The investigation commences in Chapter Three - Debt Overhang, Natural Resources and Growth: Panel Data Analysis, with a general examination of the phenomenon for a panel of 153 countries using regression analysis. The system of simultaneous equations made up of a Growth Equation, a Debt equation and a Capital Inflow equation was estimated using Generalised Method of Moments. In answering the first research question, based on the data available the results confirm that debt overhang leads to a resource curse, but the impact is not universal.

Chapter Three's investigation continued by estimating the system of equations for carefully selected sub-panels. The sub-panels were chosen to account for the role of heavy indebtedness, level of development, type of resource endowment and regional location in the debt overhang, resource and growth relationship. The estimation of these sub-panels provided the answer to the second research question. The debt overhang –resource curse hypothesis was not confirmed in the case of HIPCS. The comparative analysis between OECDs and LDCs revealed a debt overhang effect in LDCs and not

OECDs, showing that the level of development attained by an economy is also one of the key underlying factors that influence the impact of debt and resources on growth. The consideration of how debt and natural resources simultaneously influence growth in mineral rich countries, petroleum rich countries and OPECs revealed a significant debt overhang effect in Petroleum Rich and Mineral Rich countries. Since OPEC has majority control over the supply of crude oil, the debt-overhang hypothesis did not hold for that sample.

Regional location effects captured by the plainly Sub-Saharan African sub-sample confirmed the findings of studies that concluded that the resource rich continent has, over the years, been experiencing lagging growth. Even though some other studies' explanations lie within the Institutional Quality and 'Dutch Disease' theories, this thesis confirms a significant negative impact of the debt overhang-resource curse hypothesis for SSA.

As explained in the review of both the resource curse and debt literature, this thesis has pointed out that no one theory can completely explain the growth experience of resource rich countries as growth itself is a dynamic process. All existing and new explanations complement each other. Along this line of thought, even though the testing of the debt overhang- resource curse hypothesis was explicitly done, the effect of a few other complementary theories, even though with lesser statistical significance, was implicitly confirmed. The Human Capital Theory and Institutional Theory both proved to have a strong impact in all the countries and across sub-panels. Hence they complement the Debt Overhang Theory.

The findings of the GMM estimation proves that is that there is strong evidence of the debt overhang-resource curse hypothesis in the world. The impact on growth is, however, not isolated. Debt affects growth via various transmission channels explained by other theories. The mixed evidence revealed in sub-panels made a case for country specific analysis. This case study analysis was carried out in Chapter Four and Chapter Five.

Sierra Leone was the selected case study explored in Chapter Four- Debt overhang, Natural Resources and Growth: A Time Series Analysis of Sierra Leone's Experience. This country has characteristics that would render a unique perspective on the debt overhang – resource hypothesis. Sierra Leone is rich in minerals such as diamonds, iron ore, bauxite, rutile and gold, but still a heavily indebted poor country at the bottom of the human development index. It has also experienced a 10 years civil war, the onset of which lay in the dispute about the wealth gained from diamonds, hence its notoriety for 'blood diamonds'. In post-conflict Sierra Leone there has been a surge in investment by foreign companies in the extractive industry. This has driven the recent growth projections made by the IMF, World Bank, the Ministry of Finance and other international organisations. All these characteristics make Sierra Leone an ideal case study for the scope of this thesis' investigation.

The first research question, which Chapter Four of this thesis sought to answer, ‘Does debt-overhang account for the resource curse in Sierra Leone?’ was answered by estimating a SVAR model using time series data for Sierra Leone between 1970 and 2011. The results of the estimation confirmed the debt overhang-resource curse hypothesis for Sierra Leone. It was also revealed that even though resource rents alone have a positive bearing on growth, this gains are displaced by the costs of debt servicing. Some support was also provided for the Quality of Institutions Theory and the Rent Seeking Theory; hence in response to Chapter Four’s second research question, other resource curse theories do apply to Sierra Leone.

The fourth chapter went further than the SVAR estimation to determine whether there are long term relationships between debt, natural resources and growth in Sierra Leone and to investigate the causal relationship between debt and growth and between resources and growth in Sierra Leone. The cointegration analysis showed that long term cointegration relationships exist between natural resources and growth and between growth and debt overhang. Granger causality tests indicated that there is bi-directional causality between natural resources and growth. Uni-directional causality running from growth to debt overhang was also presented.

Even though Chapter Four confirmed the debt overhang- resource curse hypothesis for Sierra Leone, it also demonstrated that the country’s economic growth is intertwined with many aspects of the economy via various transmission mechanisms. When one evaluates these transmission mechanisms, it begs the question: Does growth translate into development? Also given Sierra Leone’s unique characteristics and its position at the bottom of the human development index and multidimensional poverty index, the author of this thesis deemed it necessary to carry out a more in-depth study of the situation in the country within the tenets of development. This provided the inspiration for the third empirical investigation of this thesis.

Chapter Five: Debt Overhang, Natural Resources, and Growth in Sierra Leone: a Perceptions Analysis and Documents Analysis. A mixed method analysis was carried out: triangulation of a quantitative analysis, documentary analysis, interviews and author’s observations. In the quantitative analysis, a perception-based study was carried out by estimating a structural equation model by partial least squares for a sample of 1,339 respondents randomly selected from the communities where the four largest mining companies in Sierra Leone currently operate and a control group selected from the capital city. The conceptual model combined measures of economic variables with underpinning lying in the Human Capital Theory, Institutional Theory, ‘Dutch Disease’ Theory, Conflict Theory and Debt Overhang Theory of the resource curse and measures to capture social dimensions such as health, environment and standard of living.

From the results of the estimation, it was concluded that there is evidence of the resource hypothesis and some evidence of debt overhang resource curse perceptions in Sierra Leone. A significant negative impact of government activities, which include debt servicing on development in Sierra Leone, was revealed. It is, however, worth noting that there is more wide spread awareness of Government corruption and inadequate spending on health, education, water and infrastructure than awareness of the Government's debt repayment obligations.

On the whole, from the model estimated, the activities of the household, firm and the Government explain 84% of the variation in development in Sierra Leone. It is worth noting that, in absolute terms, the impact of the Government on development outweighs the impact of the household on development which in turn outweighs the impact of the firm on development. In addressing the first three research questions, which Chapter Five sought to answer, the conclusion reached is that there is evidence of a natural resource curse in Sierra Leone; support for the debt overhang- recourse curse hypothesis and currently natural resources do not lead to a significantly improved standard of living and reduced inequality in Sierra Leone.

In its entirety, based on citizens' perceptions of the impact of resource wealth on growth and development in Sierra Leone, Debt Overhang Theory, Human Capital Theory, Conflict Theory, International Trade Theory, Welfare Theory, Quality of Institutions Theory, and Rentier State Theory explain, by varying degrees, Sierra Leone's resource related lagging development.

Following the quantitative analysis, the thesis reviewed the mining agreements which each of the four companies had signed with the Government of Sierra Leone. The company reports published by these companies over the years were also analysed. The media reports related to the activities of the companies were also surveyed. The analysis of these documents was done within the pillars of economic and social contributions to Sierra Leone. The findings from the quantitative analysis, document analysis, interviews and author's observations were also triangulated.

The quantitative and qualitative information having been triangulated, the thesis will now give recommendations on how Sierra Leone can better manage its resource wealth. This will provide the answer to the final research question.

6.2 POLICY RECOMMENDATIONS

The quantitative and qualitative results revealed shortfalls in the activities of the Government, the firms and households that have culminated in the less than expected development of the country and high level of poverty and inequality. The past has been diagnosed and the present has been examined. This research now puts forward some recommendations which the author strongly believes can help change the current natural resource- led growth situation and improve on the probability of reduced poverty.

They key is to maximise revenue from natural resource extraction, manage this revenue stream well and diversify investment into other development enhancing sectors. When this is done, the domestic economy would expand and there would be less need for external borrowing. The long run impact would be reduced debt servicing requirements, hence a potential disappearance of the debt overhang- resource curse.

This thesis' main recommendations are: a review of mining agreements between the State and mining companies; implementing mining legislation, monitoring companies and reporting to the public, improve transparency in the extractive industry sector, curb corruption, take up Government shareholding in large mining companies, improve on the infrastructure and the effect of mining on the environment, include some CSR related activities in the mining agreements, improve the local manufacturing industry, enhance human capital, reform the financial sector, plan Government revenue collection and spending, evaluate and choose donors wisely, diversify export activities and promote self-development and realistic expectations of Government and company help. The execution of all these recommendations would in this thesis' opinion, increased domestic revenue, reduced debt servicing requirements, equitable distribution of wealth and eventually accelerated economic growth.

- REVIEW MINING AGREEMENTS:

The analysis of the mining agreements between the Government of Sierra Leone and the four mining companies under review revealed that, in some cases, there are terms that have been agreed that are in violation of applicable law. Some of the terms are not beneficial to the country and the implementation of some of the potential beneficial terms is not adequately monitored. The first point should be that, as in the case of Botswana, the Government should review the ownership structure of companies seeking mining licenses. The Mines and Minerals Act of Sierra Leone requires that no shareholder of these companies should have been convicted of any offence of which dishonesty is an element in or outside Sierra Leone. It is not within the scope of this study to give details of cases which have defaulted in this area, but during the research carried out by the author a few of the large mining companies have, within their ownership structure, individuals who have been convicted of crimes in which dishonesty is an element outside of Sierra Leone.

The individual mining and tax agreements signed by the Government with companies have provided extraordinary concessions that, in some cases, fail to make complete economic sense and the Government's revenues from mining are miniscule. This study, therefore, recommends a review and amendment of the terms of these mining contracts to be in accordance with the applicable regulations and associated laws.

The advocacy for amendments to mining contracts has been ongoing by several civil society groups, such as the National Advocacy Coalition on Extractives (NACE) which wrote ‘Sierra Leone at the crossroads: Seizing the chance to benefit from mining’. According to NACE, of mineral exports of \$179 million in 2006 (of which diamonds accounted for \$125 million), only an estimated \$10 million was paid to the Government in the form of royalties and other taxes. The study suggested that, with significant institutional and capacity reforms, Sierra Leone could export US\$1.2 billion a year in mineral exports by 2020.

In the initial London Mining agreement, corporate income tax rate payable by the company was set at 6%. Although the contract has since been revised to a new tax rate of 25% it is still below the 37.5% level stipulated in Sierra Leone's Mines and Minerals Act. An agreement reached by the Government with Sierra Rutile Ltd in 2003, reduced the company's royalty rate from the required 3% to a minuscule 0.5% until 2014 and cancelled the company's payment of corporate income tax on profits until 2014. NACE reported that this royalty concession would result in an estimated \$92 million loss of revenue for the country. Despite sales of US\$28 million in 2006, NACE revealed that the company may be paying less than \$1 million in annual remittances to the Government.

The Government has given contradictory explanations as to what the President meant when, in his inaugural speech in Parliament in 2007, he said that all existing mining agreements will be reviewed and re-negotiated to benefit the people of Sierra Leone. An unnamed senior Cabinet Minister told Bloomberg News that the mining agreement with African Minerals Ltd was not up for review.

This research recommends that the Government revisit all the mining agreements to ensure all the terms, especially those related to the financials and labour, are in line with applicable legislation with no or minimal exemptions or special concessions allowed. The precedence that individual mining companies can negotiate excessive tax concessions must be reversed. If certain allowances are expected to aid attracting foreign investment to the country, they must be reasonable and applicable on the same terms with all companies. No one company must be allowed a ‘tailor made’ tax package. For example, reduced duty payments on starting up importation of machinery and equipment is, in the author's opinion, sufficient, rather than granting blanket duty free concessions for the duration of the contracts. Commodity prices are volatile. The minerals exported from Sierra Leone are high quality and often attract prices higher than the market average. The Government should consider making a provision for an excess profits tax when commodity prices are significantly higher than a specified level. The clauses that allow companies to offset 100% of their start-up capital expenditure against tax must also be reviewed.

All the contracts that this thesis has reviewed have provisions for the mining companies to apply for a renewal of their mining leases once the current term has expired. The basis on which these applications

for renewal would be granted has not been explicitly specified. This study therefore recommends that, just as in the case of Botswana, prior to granting a renewal, the Government must check that the development of the mining area has proceeded with reasonable diligence and according to the programme of mining operations that the company presented when obtaining the original lease. It must be evaluated to see whether the resources have been used in the most efficient manner. All technical, financial and commercial aspects must be re-evaluated in line with economic changes and applicable law and must be renegotiated. If negotiations do not lead to agreement within six months, the application should fail.

On February 20, 2013, Reuters reported on the official opening of the newly formed National Minerals Agency, charged with enforcing Sierra Leone's mining laws. In an interview, the director, Sahr Wonday, explained that the Agency would review the contracts and would recommend changes to the Government in cases where they felt the terms were not in the best interests of the country. In the interview, when quizzed on the large number of agreements that have not been transparent and not been negotiated in the best interest of the country, Wonday said: "Sometimes the excuse is that we had to do it because we want to attract these investors." Several governments across Africa are renegotiating mining contracts and revising their mining codes to get more revenue from the mining industry, especially, given the global rise in commodity prices. Countries such as Liberia and the Democratic Republic of Congo have reviewed all their contracts, while Guinea is in the process of reviewing its mining deals. Other countries, like Ghana and Ivory Coast, are also considering making changes to mining industry tax and royalty rates. Sierra Leone too should join this band wagon.

- INCLUDING SOME CSR RELATED ACTIVITIES INTO THE MINING AGREEMENTS:

All of the mining companies under review undertake various CSR related activities. These activities often relate to the donation of medicines, books, granting of scholarships for primary and secondary school pupils, renovations of schools and small construction projects. Most of the time these companies make some commitments to making contributions to the community in their own voluntary community development plans. The problem is that such spending is voluntary only. The companies have sometimes reneged on these commitments whilst the local communities affected by mining have retained their original high expectations about the commitments made by the companies.

Sierra Leone's mining legislation does not require companies to provide either social or infrastructural services – such as electricity, water, education or healthcare to local communities affected by mining, yet these communities are overwhelmingly in need of basic amenities such as access to safe water, electricity and good schools. In almost all cases, as per the author's observations, the companies do the minimum, even regarding the standard of construction. For example, when roads are being constructed

or repaired, tarmac is not applied. In the rainy season, they become full of potholes. The roads in all the mining communities are deplorable. When community meeting centres are constructed, for example in the case of SMHL, they are not furnished, not even with benches. Sierra Rutile Ltd has developed a voluntary community development programme, but has so far failed to spend any significant amounts of money.

During the interviews conducted with management level staff of the different companies considered by this thesis, one point became clear: a visible difference between what the companies think is required by legislation and what is voluntary. When questioned on not maintaining progress on environmental and other developmental projects promised and documented, they replied that their companies were not currently making profits. However, there is no section in the documents available that stated that contributions to community and environmental development programs are conditional on the companies recording profits.

The Government instituted the Community Development Fund to help support development through company payments into the fund. However, the fund has been faced with problems linked to poor governance at the local and community levels. There are also hardly any publicly available updates on how the money is being used to fund development; especially much needed roads and social infrastructure.

This research therefore advises that clauses be included in agreements to convey firmer commitments by companies to carry out developmental projects. Given the level of corruption in the country and the difficulties associated with administering funds of both the Community Development Fund and the Environmental Protection Fund, the author is of the opinion that the mining companies be required to contract out the implementation of key projects, especially those related to water supply, the construction of roads and provision of electricity rather than contributing to a fund where misappropriation and non-accountability is likely. Tangible evidence, i.e. such as these constructions works, would also go a long way in fulfilling expectations of the locals and directly improve infrastructure.

-IMPLEMENTATION, MONITORING AND REPORTING:

Amending current mining contracts and mining legislation on its own does not guarantee positive results. The changes need to be implemented. Companies must be monitored to ensure that they abide by the rules and regulations and outcomes must be reported to all the necessary authorities concerned. The different mining companies must also keep accurate records that must be reported to the Government.

The country lacks adequate monitoring mechanisms to ensure that mining companies are operating within the laws of the State. Monitoring in this case encompasses assessing and collecting revenue. It also has

to do with acquiring geological information, especially to determine whether the companies mine only the minerals they are licensed to and, in cases where other mineral deposits have been found, such deposits have been reported.

There are concerns that there are discrepancies between what some companies report to have exported and what the actual export amounts and values are. The volume of diamond exports, for example, is believed to be at least double what is officially declared. The Government should, therefore, outline and implement a strategy to combat smuggling.

There are also wide spread fears in the country that mining companies are underreporting profits or involved in creative accounting. These fears could only be laid to rest if the Government has the capacity to, and actually does, carry out regular audits of some mining companies. In the interview with a member of staff from the Ministry of Mines and Minerals Resources, the interviewee explained that they (that is the Ministry of Mines and Minerals Resources) deal with only the financial reports submitted by the companies. He explained that it difficult to tell whether these companies are making profits. They could inflate costs and the Government does not audit them. Another interviewee from the National Revenue Authority highlighted the possibility of companies bribing mining officials. It is therefore recommended that all large mining companies be subject to an independent audit.

Botswana's Mining Act of 1999 provided for an authorised Government official who can, at reasonable times, inspect mining premises, ascertain whether terms of the act are being complied with, examine financial records and take soil samples. The application of such a monitoring mechanism is needed in Sierra Leone especially amid corruption and low revenues from the mining sector. Reporting losses and making losses are two different things.

- TRANSPARENCY

Monitoring and reporting can contribute to the greater good and improved accountability by all parties when there is transparency. Transparency in this case should not only be between the Ministry of Mineral Resources and the Mining companies, but should also include inter ministry and inter agency communication and also the making of mining information available to the general public. In NACE's report, *Sierra Leone at the Crossroads (2009)*, the Director of the Ministry of Mines and Mining highlighted the lack of proper coordination and information flow between the Ministry of Mineral Resources and the National Revenue Authority, which collects taxes from mining companies. Lack of transparency helps drive corruption within the industry and limits the effectiveness of policies.

In a bid to improve transparency in the extractive sector in Sierra Leone, on January 19, 2012, Sierra Leone launched The Government of Sierra Leone Online Repository System, an online mining database. This database is a joint initiative between the Government, United Nations Development Program

(UNDP), the German Society for International Co-operation (GIZ), the Revenue Development Foundation, the World Bank and other international donors. Before the setting up of the online repository, information relating to transactions between the Government and natural resource extraction companies was kept at the Ministry of Mines as paper documents. These old records were so poorly kept that the new database was only able to include information collected after 2010. At the launch ceremony of the repository, the Minister of Mines and Mineral Resources, Minkailu Mansaray, said: "This system will stamp out all forms of malpractice in terms of licensing, financial management and general information pertaining to the mining sector. The public should be aware of what mining companies pay to the Government and what the Government receives from mining and exploration companies."

The Online Repository System was part of the industry improvements needed to make Sierra Leone compliant with the Extractive Industries Transparency Initiative, which requires the timely publication of payments made by mining companies to governments and revenues generated from the projects. However, on evaluation of Sierra Leone's 2012 Validation report, the Validation Committee of the Extractive Industry Transparency Initiative (EITI) concluded that Sierra Leone had not achieved compliance with all requirements and, as this was the second Validation, the rules of the EITI indicated that the country should be delisted. However, the Board of EITI instead temporarily suspended Sierra Leone on February 26, 2013. According to the EITI, the suspension will be lifted if the country successfully implements the remedial actions recommended by the Board. If suspension is in effect beyond February 25, 2014, the Board will consider delisting Sierra Leone. For a greater scope of transparency, this research recommends that all large companies operating in Sierra Leone's extractive industry should immediately commit themselves to publicly report their basic financial data, annual accounts, remittances to the Government and their community development spending.

Sierra Leone has only recently, on October 29, 2013, enacted its freedom of information law that would guarantee access to government records, such as the original documents regarding mining agreements and transactions. By comparison, in Botswana the Minister of Mines maintains records which are open to inspection by the public as long as the records do not include confidential information. This research therefore recommends that the Government of Sierra Leone must commit to meeting all the criteria needed for full membership of the EITI and also implement the terms of the Mines and Minerals Act completely. Implementing the terms of the Mines and Minerals Act and meeting the criteria of the EITI would result in all the following information being properly collected, validated, recorded and made available to the public: information contained in all mining contracts, information on licensing fees, royalties, taxes and other contributions from the mining sector to the Government, all mining, trading and exporting companies in the minerals sector. This would help ensure that all the companies operating within the country's extractive industry comply with international trading protocols.

Amending Mining Agreements and improving on monitoring and transparency on their own do not guarantee maximum returns from extractive activities. This research is of the opinion that other changes need to be undertaken to improve on the probability of natural resources leading to economic growth and development. The first step to ensuring that the State is at the heart of all mining decisions is that the Government should have shares in all large mining companies. Closely related to the issue of transparency is that of corruption.

- CORRUPTION

The high incidence of corruption in Sierra Leone has played a significant role in negatively affecting the trickling down and widespread benefit of resource rents in the country. Corruption is not specific to the mining industry. It is evident in all sectors in the country. Sierra Leone is ranked 142nd out of 163 countries in Transparency International's Corruptions Perceptions Index. Preliminary reports from the Office of the Millennium Challenge Corporation in Sierra Leone (MCC) revealed that, as at September 2013, Sierra Leone is likely to fail the control corruption criteria for receiving funds from the MCC due to high level of corruption at all levels. This study therefore recommends that corruption be eradicated at all levels of activity in the country. The Director General of the Ministry of Mines and Mineral Resources has stated that 'reducing corruption and rent seeking' is one of the challenges facing the Ministry, which he recognises 'has had a reputation for corruption'.

- GOVERNMENT SHARE HOLDING

Government being a shareholder in large mining companies is nothing new in Sierra Leone. In September 1970, the Government acquired a 51% stake in Sierra Leone Selection Trust (SLST) through the National Diamond Mining Company (NDMC). However, due to corruption, the then Prime Minister, Siaka Stevens, allowed Jamil Said Mohamed, a Lebanese business man, to buy 12% of the Government's share without an open bidding process. As shown in the analysis of the mining agreement between Sierra Rutile Ltd and the Government, the state had a 47% stake in the company, which it eventually gave up in exchange for cash settlements. In comparison, in Botswana, the Government has a 50% equity stake in the country's largest diamond mining company. This research therefore recommends that the Government seeks to ensure equity shares in all large scale mining companies. The Government has the option to acquire equity in large scale mining companies in accordance with Section 162 of the Sierra Leone Mines and Minerals Act of 2009: 'The Government of Sierra Leone shall have the option to acquire on such terms as shall be agreed upon between the holder of a large-scale mining licence and the Government, shareholding interest in any large-scale mining operations'. The Sierra Leone Petroleum Act of 2011 permits establishment of a State-owned Sierra Leone National

Petroleum Company which should have a 10% stake in any oil block in the country. This research therefore recommends that when the Government exercises its equity option in large scale mining companies, its stake should be at least 10%.

The potential gains from resource extraction are highly correlated with the country's absorptive capacity. In the case of Sierra Leone, this study believes that the country's infrastructures all have a role to play in enabling the gains from the extractive industry to trickle down to the masses.

- **INFRASTRUCTURE AND THE ENVIRONMENT**

For the scope of this study, infrastructure encompasses roads, electricity, water supply telecommunications and the provision of health and sanitation services. The International Monetary Fund country report on Sierra Leone in 2011 and 2012 provided a good update on key sectors of the economy. The report revealed that the country needs to develop a 'Rural Electrification Strategy' and work towards ensuring a stable and reliable electricity supply. The installation of solar street lights in Freetown and district headquarter towns is on-going with funding from the ECOWAS Bank for Investment and Development (EBID) and the Government. The Government has also constructed a solar technical college at Konta Line in the Port Loko district. The report also showed that, with funding from the Chinese Government and the European Union, work will also soon commence on the construction of mini hydro-electric dams at Makali, Charlotte, Port Loko (Bankasoka) and Moyamba. The key revelation from the report related to the country's electricity supply is that the relatively good performance in the manufacturing sector occurred at a time when the electricity supply to Freetown improved following the commissioning of Bumbuna in 2009 and the installation of a 10MW thermal power generating machine from the Japanese International Cooperation Agency (JICA). This sheds some light on the importance of good electricity supply for both economic and social purposes.

The IMF country report also reported that trunk roads are being constructed in all cities and district headquarter-towns. This research recommends that more effort be made on feeder road development as these roads are very crucial in improving access by local communities to markets, especially for perishable agricultural products.

Even though Sierra Leone is blessed with lots of rivers, rainfall and underground water resources, there is still a problem of access to clean and safe drinking water. There is also problem with access to water, especially pipe borne water, for daily activities. All the water projects currently undertaken by mining companies have to do with digging new water wells or chlorination of existing wells. There are no mining company projects for pipe borne water, but mining staff are provided with machine-purified drinking water not chlorinated water. Cholera outbreaks are quite common, almost on an annual basis. This paper

therefore recommends that steps be made to improve water supply as it affects not only people's health but also other aspects, for example hygiene promotion, sanitation and construction works.

As is often said, health is wealth. Most of the companies in the extractive industry operate health centres for their staff and their immediate family. They sometimes make donations of general medicines to certain hospitals when it suits or at times of crises. The Ministry of Health is currently implementing the free health program for under five year olds and pregnant women. However, the coverage of access to quality health care is still a problem in the country and life expectancy is still low when compared to other countries. It is therefore recommended that Government expenditure and policy reforms to strengthen the health sector are highly needed and can have large multiplier effects for all sectors of the economy.

Whilst attention is being paid to the infrastructure of the country, the effects of such large scale mining on the environment must not be neglected. The recently incorporated Environmental Protection Agency has the legal authority to monitor Environmental Impact Assessments (EIAs) of mining companies. Since it is newly formed, this research advises that a review of the environmental impacts of the mining companies be undertaken and it is ensured there are mechanisms in place to monitor them. There is a need to also reassess the compensation for damaged land and surface rent currently paid to the local communities.

An improvement in the country's infrastructure does not only improve standard of living and absorptive capacity, it also helps improve the business environment and boost local industries.

- LOCAL MANUFACTURING

The 2011 IMF Country Report on Sierra Leone revealed that output in the manufacturing sector increased, mainly due to an increase in the provision of electricity. Sierra Leone's manufacturing industry base is limited to the production of paint, cement, alcoholic and non-alcoholic beverages, acetylene oxygen, flour, common soap and confectionary. It will be recalled that the mining agreements gave priority to local products to be used by mining companies. From the aforementioned main products manufactured in the country, very few are of significant importance to the mining trade. Therefore, even though the provision is there, unless local manufacturing of relevant products commences, such provisions would only be for show.

Closely related to the issue of local manufacturing, this study also recommends processing plants for the main mineral exports be set up to add value to the produce and help Sierra Leone benefit from the value added product through more trading opportunities. For example, in the case of Sierra Mineral Holdings, it sells its produce to the parent company, Vimetco Alum SA's refinery in Romania, where the bauxite is refined and processed into aluminium. Aluminium has a significantly higher value than the raw material

and Sierra Leone currently does not get a share of this added value. However, if processing plants are set up, the country could benefit from the added value along every step in the value chain.

- EMPLOYMENT AND HUMAN CAPITAL

Sierra Leoneans should be given employment priority in mining companies according to the mining agreements. However, at present, apart for unskilled and semi-skilled labour, only a few Sierra Leoneans make up the professional cadre of these companies. This problem has a twofold approach. The companies need to do more to recruit Sierra Leoneans and Sierra Leoneans need to train in more technical skills aligned to the mining trade. This study acknowledges that the Sierra Leonean labour supply for certain technical mining jobs is low. However, there are qualified Sierra Leoneans to fill positions in other administrative and semi-skilled areas. During the launch of the Joint Initiative between African Minerals, the University of Sierra Leone and the Ministry of Education to help improve training and employment of Sierra Leoneans in the mining industry, the Minister of Education said: “The lack of adequate numbers of personnel with marketable skills needed in the mining industry has been a source of concern and has resulted in the importation of expatriates to function at both middle level and professional cadres.” The key is, therefore, to develop and strengthen human resources in the minerals sector.

This research therefore recommends that training institutions be set up to specifically train individuals in the skills that are marketable to the mining industry. The mining companies must also be monitored so ensure that they ‘transfer knowledge’, so as to guarantee the gradual replacement of expatriates with Sierra Leoneans. During visits to the communities in which the four companies under review operate, the author of this study noticed that women are mostly not included in most technical jobs associated with the mining industry. This thesis therefore recommends that measures be put in place to encourage gender equality and the participation of women in the extractive sector. A high number of school dropouts was also observed. Most of these school dropouts leave to become unskilled workers at the mining sites. If apprentice programmes are developed and run by these companies, such school dropouts would eventually gain more marketable skills.

In the analysis of newspaper articles and the author’s findings, there was a vast difference in wage structure between indigenes and expatriates. Wages are one of the most direct ways in which households can benefit from the impact of natural resources. This paper therefore recommends a revisiting of the minimum wage structure for Sierra Leoneans in all sectors. Adequate human capital significantly improves the absorptive capacity of a nation.

The Government is currently in the process of presenting a draft ‘Local Content’ Policy to Parliament, so it could be enacted. According to the policy, at least 20% of a foreign company’s management must

be Sierra Leonean, at least 50% of intermediate positions must be held by Sierra Leoneans and all junior level staff positions, such as drivers, security personnel, secretaries etc., must be held by Sierra Leoneans.

This is a step in the right direction. This research also suggests that the 'Local Content Policy' be extended to cover the procurement of goods and services from Sierra Leone to strengthen the trickle-down effects from the mining sector. Key services which this study believes should be 100% provided by indigenous Sierra Leonean companies and which these companies have the capacity to provide include, but are not limited to: customs clearance and freight forwarding services; logistics, especially transportation; and supply of fresh foods. For example, there have been clashes with local transport owners and management of the London Mining Company and Bolore African Logistics (a foreign owned company) regarding contracts for haulage of iron ore for LML. This study suggests that such transportation services be provided only by indigenous companies.

Invitations to bid and advertisements for the provision of such services must be advertised in the local media. This research discovered that advertisements for the provision of logistics services are often only advertised in foreign magazines, to which most Sierra Leoneans do not have access, and not in the local newspapers. There have also been incidences where foreigners have successfully bribed corrupt Sierra Leoneans to fraudulently register companies in a Sierra Leonean's name, to pass off as an indigenous company.

The local industry must therefore be empowered and protected at all levels. The sales receipts of the mining exports go to the mining companies. The employment of Sierra Leoneans and use of Sierra Leoneans companies for the provision of services are the main paths through which the returns from mining activities can trickle down to the masses, hence enhancing standard of living, reducing poverty and improving development.

- FINANCIAL SECTOR REFORM AND DEVELOPMENT

Whilst work is undertaken to strengthen the labour market in favour of Sierra Leoneans, this research also recommends that the country's financial sector be strengthened. The capital market has a very significant role in contributing to economic growth by providing access to capital. When the fund raising activities of large mining companies is scrutinised, from the company reports it is clear that all these companies are listed on stock exchanges in foreign countries. Even Koidu Holdings, which is not already listed, is considering listing on the Hong Kong Exchange in a bid to raise \$400 million to boost production (Financial Times, 2012). There is, therefore, a need to reform the financial sector and develop the capital market in Sierra Leone so as to enable mining companies listed on the Sierra Leone Stock Exchange to access capital and raise funds and give Sierra Leoneans the opportunity to invest in these companies. It will also enable investment in trusts and mutual funds and provide investment opportunities for institutional investors.

In 2001, the Sierra Leone Stock Exchange Company was registered under the Companies Act of Sierra Leone as a private company limited by guarantee. The Other Financial Services Act of 2001 was also amended to allow for the establishment of an interim stock trading facility and the licensing of brokers and dealers in securities. The Bank of Sierra Leone is the technical service provider and regulator of the stock market until the establishment of a Securities and Exchange Commission (SEC). Sierra Leone only currently operates an interim stock exchange and there is widespread lack of interest, mainly due to the shortage of listed companies and the lack of knowledge of how capital markets work.

This study advises that steps be taken to reform the financial sector in the country to aid the development of a robust capital market. Some of these steps include strengthening regulations on investment, reviewing bankruptcy laws and laws to protect investors. A well-developed capital market, especially a developed stock market, would give companies access to investment capital outside the banking system and often prove to be cheaper and longer term than bank loans. It also encourages the investment of private savings. A well-developed capital market also promotes corporate accountability, transparency and regulation. It also enables companies to meet their funding needs, invest directly in Sierra Leone and avoid the use of tax havens, and grow and create employment opportunities, helping overall economic growth.

- GOVERNMENT REVENUE, SPENDING AND LENDING

As explained in the theoretical framework of the empirical part of this research, external debt is accumulated to fill the foreign exchange and savings gap in the domestic economy. In Sierra Leone, government expenditure continuously exceeds government revenue, hence the need for external sources of revenue: debt and aid. The 2011 International Monetary Fund country report for Sierra Leone (2011) showed that, as at the end of December 2010, the country's outstanding debt was US\$ 767.9 million compared to the stock of US\$ 692.6 million as at December 2009. Reports from the Ministry of Finance also reveal that the country's outstanding debt continues to increase annually. Multilateral debt accounts for the largest share of Sierra Leone's external debt portfolio, representing 61.9 % at the end of 2010 (Public Debt Management, 2011). This largest proportion of multilateral debt is maintained, despite the HIPC status of the country. Since Sierra Leone reached HIPC Completion Point in December 2006, annual debt service payment obligations have declined by over US\$25 million annually.

This clearly highlights the significance of the main research question of this thesis. Debt overhang has severe implications on the impact of resource rents on development. With such a large value of outstanding debt, debt sustainability will remain a priority in Sierra Leone. Much of the Government

receipts should be spent on debt servicing, deficit financing and spending on donor projects to keep in line with the donor conditionalities attached.

There have been improvements in the country's debt reporting system. A comprehensive national Debt Law and procedures manual has been enacted by Parliament. The Public Debt Unit of the Ministry of Finance, in collaboration with other Government agencies, is working on improving the quality of debt data and reporting in order to better monitor commitments, disbursements and debt service obligations. The Government is also seeking assistance from the World Bank and the IMF to develop a comprehensive Medium-Term Debt Management Strategy (MTDS). The Commonwealth Secretariat Debt Recording and Management System (CS-DRMS) will be electronically linked with the Integrated Financial Management Information System (IFMIS) to further improve on debt management.

Notwithstanding these steps to improve transparency and management in the debt sector of the economy, this research wishes to stress that the first step should be reducing the need for external lending by improving on Government revenue and managing Government spending. There are many loopholes in the country's revenue collection system, both tax and non-tax revenue. Considering the extractive industry alone, the amount of revenue currently being collected from that sector is miles below the potential revenue the sector can generate. The Government must learn to invest in other sectors from which they can earn returns and help reduce the need for external lending.

Closely related to the issue of Government lending is the role that donors play in influencing Government expenditure.

- DONORS AND CREDITORS

The huge budget deficits faced by the Government often constrains it to abide strictly to the conditions attached to donor funds, whether they are in the best interest of the country or not. The two main lenders that severely impact on Government policy in Sierra Leone are the World Bank and the IMF. The potential growth limiting effect of donor conditionalities has been revealed by studies such as Oxfam (1995) and Collier (1997).

In a similar light, in the DanWatch Report it was explained that, in a confidential 2007 document shown to NACE researchers by an official in the World Bank, there are ten policies that the Government must implement (triggers) in order for it to receive a US\$10 million loan from the World Bank. According to the report, one of the policies the Government must implement is 'make changes to the mining tax regime in line with recommendations from the International Monetary Fund (IMF). The report explained that, although some of these recommendations were reasonable some areas in which changes should have

been recommended were left untouched. It reported that the IMF did not recommend any increases in the royalty or other tax rates and asked that the royalty rate for precious metals, currently at 4%, be reduced to 3%. It also recommended that the terms of the mining agreement between Sierra Rutile and the Government in 2003 should be implemented. It will be recalled that this thesis has highlighted the shortfalls of that agreement; especially the Government's relinquishing its shares in the company and the concessionary financial terms. It is therefore worrying that such an institution fails to see the harm in such terms.

Most multilateral donors to Sierra Leone have often stressed on institutional strengthening and capacity building. A large portion of funds are assigned to such activities and often expatriates are paid large sums of money to train Sierra Leoneans. For example, the United Kingdom's Department for International Development (DFID) has provided £2 million over two years to improve the institutional capacity of the Ministry of Mines. This project is implemented by Adam Smith International (ASI), a British consultancy, and the implementation of this project partly involves funding an expatriate in the position of Director General of the Ministry. DFID is also planning to spend £16 million to help reform the National Revenue Authority.

This research welcomes such support as it helps enhance the institutional capacity of various institutions in the country with long term positive effects on the economy. The bone of contention, however, is that some donor conditionalities are counter-productive to the revenue generation and collection capability of the country. It is this research's opinion that donors must recommend and support mining tax reforms that result in greater revenue to the Government. Without adequate internally generated funds, the country will always be in a debt overhang cycle.

Even if the Government of Sierra Leone and the mining companies implement all the above recommendations, the revenue generation process to eventually deliver the country from its debt overhang resource curse dilemma lies within the diversification of export activities.

- DIVERSIFY EXPORT ACTIVITIES

Sierra Leone is highly dependent on primary exports in the mineral and agricultural sector for revenue, apart from what is generated locally through taxes and duties, receipts from external donors and external creditors. If it is assumed that the revenue collection is 100 %, which is not the case, the country still remains highly vulnerable to conditions on volatile international commodity markets.

The Government should therefore continue to pursue strategies to diversify the export base. Sierra Leone should seek to encourage production and export of non-traditional exports and commodities from the secondary or tertiary sector, including manufactured goods, refined primary commodities and services and commercialisation of the agricultural sector. The country should consider developing tourism and

large scale rice and rubber production and fishing activities. In Botswana, the economy was diversified into the production and export of textiles and leather, tourism, business outsourcing and research.

- **SELF DEVELOPMENT AND EXPECTATIONS**

Notwithstanding all the steps and activities the Government are expected to take, the issue of sustainable growth and development does not rest solely with the state. Expectations in the communities affected by mining are high. From the author's observations, mining communities sometimes have unrealistic expectations of what mining firms will or should deliver. Whilst this research has shown that expectations have positive significant impacts on the activities of the Government, it is recommended that communities be involved in self -help and development projects which the Government and development partners can support. Making efforts to achieve at least basic reading and writing skills can help provide the foundation for further training, especially technical training. It is not advisable that the development of every aspect of life in the country be conditional on what the Government can do. Self-help can foster more rational expectations and help drive development at an even faster rate.

The main recommendations therefore cover reviewing all the current mining agreements between mining companies and the Government of Sierra Leone, ensuring transparency in the extractive sector, prudent spending of resource rents, selecting donors and lenders wisely, promoting the local manufacturing industry, improving on infrastructure and human capital, diversifying the investment of resource wealth into other sectors of the economy and revising expectations to include the need for self-development and not complete dependence on the Government and international firms.

6.3 RESEARCH LIMITATIONS

This research has developed a framework and methodology than can be readily applied to any economy in the world. Following this methodology would not only provide empirical solutions but would also go beyond the numbers to give 'behind the scene' coverage of the debt, resource and growth relationship, not only from the standpoint of the Government, but also the firm and the household.

Notwithstanding, the empirical estimation is limited by the availability of data. It is also possible that it suffers from data source bias in the case of the time series data collected. The time period in the GMM estimations is only between 1970 and 2011. Such time series data are updated annually. The world is always evolving; therefore there is always the need for more studies using much more up-to-date data. This is especially true for the qualitative analysis conducted. Most of the companies that have been reviewed have been in full time uninterrupted operation in Sierra Leone for less than ten years. There is

still time for the long term effects of their operations to be felt at all levels of the economy. There is also the possibility for changes in regulations and legislation to be applied. This research believes, therefore, that there is room for further research in this area in years to come.

Markets are imperfect. Most countries are always faced with shortfalls in domestic revenue and savings, hence the need for borrowing. Resources can be depleted, but the expectation of them promoting development and alleviating poverty is ever increasing. The main investigation carried out by this thesis, 'Debt Overhang and Natural Resources: Revisiting the Resource Curse Hypothesis'; will not become obsolete any time soon. It is the author's opinion that the debate will remain relevant until all the countries of the world are developed and poverty is completely eradicated.

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APPENDICES

APPENDIX ONE: LIST OF COUNTRIES

OPEC: Algeria, Angola, Ecuador, Iran, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, Venezuela

Mineral rich Countries: Albania, Algeria, Angola, Argentina, Australia, Austria, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, China, Columbia, Congo DRC, Congo Rep, Cote D'Ivoire, Croatia, Cuba, Djibouti, Dominican Rep, Egypt, Equatorial-Guinea, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guinea, Guinea Bissau, Guyana, Haiti, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Korea Rep, Lesotho, Liberia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Morocco, Mozambique, Namibia, Nepal, Nicaragua, Niger, Peru, Philippines, Portugal, Russia, Rwanda, Saudi Arabia, Sierra Leone, Somalia, South Africa, Spain, Swaziland, Sweden, Tanzania, Turkey, Uganda, Ukraine, Zambia, Zimbabwe

Petroleum Rich Countries: Albania, Algeria, Angola, Bahrain, Bangladesh, Barbados, Belarus, Cameroon, Canada, Central African Republic, Canada, Chad, Colombia, Congo Rep, Cote d'Ivoire, Croatia, Cuba, Djibouti, Ecuador, Egypt, Equatorial Guinea, Gabon, Ghana, Greece, Hungary, India, Indonesia, Iran, Ireland, Italy, Kazakhstan, Kuwait, Libya, Malaysia, Mexico, Mongolia, Netherlands, Nigeria, Norway, Oman, Pakistan, Papua New Guinea, Peru, Philippines, Poland, Qatar , Romania, Russia, Saudi Arabia, Somalia, Sudan, Tajikistan, Trinidad & Tabago, Tunisia, United Kingdom, United States of America, Venezuela, Yemen

HIPC: Benin, Bolivia, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo DRC, Congo Rep, Cote d'Ivoire, Ethiopia, Gambia, Ghana, Guinea, Guinea Bissau, Guyana, Haiti, Honduras, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Nicaragua, Niger, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Uganda, Zambia

LDC: Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Central African Republic, Chad, Comoros , Congo DRC, Djibouti, Equatorial-Guinea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Lao PDR, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Samoa, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Uganda, Yemen, Zambia

OECD: Australia, Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea Rep, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States of America

SSA: Angola, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo DRC, Congo Rep, Cote d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sudan, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe

APPENDIX TWO: SYSTEM RESIDUAL CROSS-CORRELATIONS AT LAG 12

	Growth Equation	Debt Equation	Capital Inflows Equation
WHOLE PANEL			
GDP	-0.009863	0.042396	0.033470
DSV	0.008304	0.016388	0.008663
CAPFLOW	-0.004554	0.002644	-0.000546
OPEC PANEL			
GDP	-0.036029	-0.029492	0.003993
DSV	0.038077	-0.004191	-0.023230
CAPFLOW	0.000529	0.003357	-0.001222
OECD PANEL			
GDP	-0.005880	-0.008245	-0.019751
DSV	0.060041	-0.027601	0.030129
CAPFLOW	0.035828	0.006082	-0.009610
LCD PANEL			
GDP	0.040768	0.028230	-0.000812
DSV	-0.023576	-0.039267	0.000917
CAPFLOW	0.005664	0.016285	-0.020034
HIPC PANEL			
GDP	-0.018925	-0.003895	0.002610
DSV	0.030467	-0.007302	-0.005042
CAPFLOW	0.009874	-0.037944	0.016495
MINERAL RICH PANEL			
GDP	0.001028	-0.003357	-0.001222
DSV	-0.020333	0.002644	0.008738
CAPFLOW	0.037621	0.000184	0.005883
PETROLEUM RICH PANEL			
GDP	-0.006242	-0.031358	-0.026774
DSV	-0.012298	-0.046981	0.027385
CAPFLOW	0.003567	-0.010813	-0.009283
SSA PANEL			
GDP	0.049545	-0.003895	-0.000812
DSV	-0.023576	0.007077	0.002610
CAPFLOW	-0.036443	-0.064493	0.000917
All the correlations are not significantly different from zero at the 5% significance level.			

APPENDIX THREE: SVAR RESIDUAL SERIAL CORRELATION LM TESTS

Lags	LM-Stat	Prob
1	NA	NA
2	NA	NA
3	205.4568	0.0006
Null Hypothesis: no serial correlation at Lag Order h		

APPENDIX FOUR: SAMPLE OF SURVEY QUESTIONNAIRE

QUESTIONNAIRE

1. RESPONDENT'S INFORMATION (Please mark (x) where applicable)

1.1 Occupation:

1.2 Age:years 1.3 Sex: Male [] Female []

1.4 Educational Level: None [] Primary [] Secondary [] Tertiary []

1.5 Marital Status: Married [] Single [] Divorced [] Widowed []

1.6 How long have you lived in this community/village?

Less than 1 year [] 1 to 3 years [] 4 to 6 years [] 7 or more years []

1.7 What is your homeland/background status in this community?

Indigenous [] Settler/Settler descendant [] Migrant []

1.8 If you are a migrant, Why did you move to this community?

.....
.....

1.9 Does your family live with you in this town/village? Yes [] No []

2. COMMUNITY PROFILE

2.1 What are the two principal economic activities for **men** in this community?

(a)..... (b).....

2.2 What are the two principal economic activities for **women** in this community?

(a)..... (b).....

2.3 Approximately how many people of working age are unemployed in the community?

<10% [] 11%-20% [] 21%-40% [] 41%-50% [] >50% []

2.4 In the last three years, availability of employment has:

Improved [] Worsened [] Remained the same []

2.5 Please, give reasons for your answer in 2.4

.....
.....

2.6 In your opinion, the overall standard of living in the community is:

Prosperous [] Good [] Average [] Poor [] Very Poor []

3. THE EFFECT OF MINING ACTIVITIES ON HOUSEHOLDS

3.1 Which mining company is operating in your area?

African Minerals [] London Mining [] Sierra Rutile [] Sierra Mineral Holdings []

3.2 What was your occupation before the commencement of mining operations?

Agriculture [] Civil service [] Mining [] Petty Trading [] Self-employment [] Unemployed []
Private Sector [] Other.....

3.3 What is your current occupation?

Agriculture [] Civil service [] Mining [] Petty Trading [] Self-employment [] Unemployed []
Private Sector [] Other

3.4 Mining activities have benefited my household?

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

3.5 How has mining activities benefited your household?

Employment [] Petty Trading [] Contract with mining company []
Education/Training [] No benefit []

3.6 What was your monthly household income before the commencement of mining activities in your community?

<Le500, 000 [] Le 500,000 – Le 1000, 000 [] Le 1000, 000 – Le 1, 500, 000 []
Le 1, 500, 000 – Le 2, 000, 000 [] Le 2, 000, 000 – le 2, 500, 000 [] > Le 2, 500, 000 []

3.7 What is your household income after the commencement of mining activities in your community?

< Le500, 000 [] Le 500,000 – Le 1000, 000 [] Le 1000, 000 – Le 1, 500, 000 []
Le 1, 500, 000 – Le 2, 000, 000 [] Le 2, 000, 000 – le 2, 500, 000 [] > Le 2, 500, 000 []

3.8 Is the change in your household income influenced by mining activities in your community?

Yes [] No []

If yes in Question 3.8 , Please briefly explain how.

.....
.....

4. THE EFFECT OF MINING ACTIVITIES ON MINING COMMUNITIES

4.1 Mining activities have benefited my community.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.2 How has mining activities benefited your community?

Employment [] Education/training [] Health/ sanitation [] Electricity []
Infrastructure [] Investment [] Business Services []

4.3 Mining activities divert attention away from other activities e.g. farming, manufacturing.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.4 Mining companies are doing enough in promoting health, Agriculture, Education, local business and investment.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.5 Mining companies employ enough Sierra Leoneans

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.6 Expatriates are willing teach and transfer skills to locals.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.7 Locals are willing to learn from Expatriates.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.8 Mining activities have increased corruption in the community.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.9 Mining activities destroy the environment and wild life

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.10 Resources generally lead to development.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.11 Please give a reason for your answer in (4.10)

.....
.....

4.11 The Government Spends money from mining companies on paying Sierra Leone's debt.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.12 Most of the Money the Government gets from mining companies is lost in corrupt activities.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.13 Government spends money from mining companies on health, education and infrastructure.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.14 What do you think the Government spends money from mining companies on?

Salaries [] Infrastructure [] Agriculture [] Paying-off external debts []
Self-enrichment [] National Savings [] Other.....

4.15 What do you think the government should spend money from mining companies on?

Salaries [] Infrastructure [] Agriculture [] Paying off external debts []
Self-enrichment [] National Savings [] Other.....

4.16 What do you think Mining Companies should do for the community?

Employment [] Health projects [] Agriculture projects [] Electricity []
Roads [] Other.....

4.17 If we do not gain sufficiently from the mining activities, we would riot or go to war.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.17 If you and your neighbours are strongly dissatisfied about any activity of mining companies you would:

Demonstrate peacefully [] Write letters of complaint to the local leaders []

Write letters of complaint to contact mining staff [] Riot []

4.19 What should the Government do to increase chances of Sierra Leone benefiting from her natural resources in the long term?

.....
.....
.....
.....

4.20 I expect the Government and Mining companies to do more in helping Sierra Leone develop.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

4.21 I expect myself to do more to help Sierra Leone develop.

Strongly Agree [] Agree [] Neutral [] Disagree [] Strongly Disagree []

APPENDIX FIVE: SELECTED PICTURES FROM FIELD WORK

Picture	Brief Description
	<p>London Mining Ltd's mining site.</p>
	<p>Farming land destroyed as a result of African Minerals Ltd's mining activities</p>



Proof that the rosy pictures of land rehabilitation and agricultural projects reported in Company Reports are exaggerated.



Poor sanitation and poor quality drinking water projects. Supporting this thesis's view that for CSR activities companies do the bare minimum.



Lack of pipe borne water for cooking, drinking and general hygiene in the AML Ltd community.



Flooded and polluted land as a result of London Mining Ltd.'s activities.



Village relocated by London Mining Ltd. Notice the newly built houses, not previous mud houses.



Evidence of companies not applying tarmac on the roads their vehicles use and villagers subjected to high levels of dust inhalation



Off –site view of railway operated by AML Ltd. for the transportation of iron ore



Sierra Rutile Ltd operation site.



Sierra Mineral Holdings Ltd's truck transporting products on poor quality roads



New constructed radio station by Sierra Rutile Ltd.



The most common occupation in the mining areas: commercial bike riders. i.e. using bikes as taxis.



Typical type of mud and thatch housing where locals of SMHL community live.



Market close to AML Ltd operating site where the prices of most items are inflated due to nearby mining activities.



SMHL workers returning home from work. The company provides used school buses from the USA for this purpose.



Typical housing in Sierra Rutile Ltd community. Poor roads, no electricity, no pipe borne water, poor sanitation.



Typical AML Ltd community housing.



Community primary school in Gondama , Sierra Minerals Holding Limited mining community.



Sierra Mineral Holdings Limited mining site.



SMHL casual labour.



Bathing and drinking from the same water source.



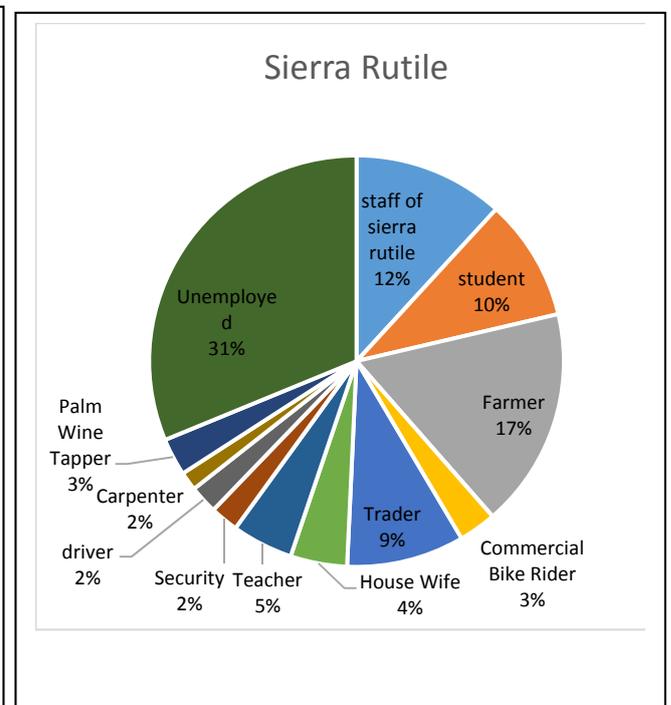
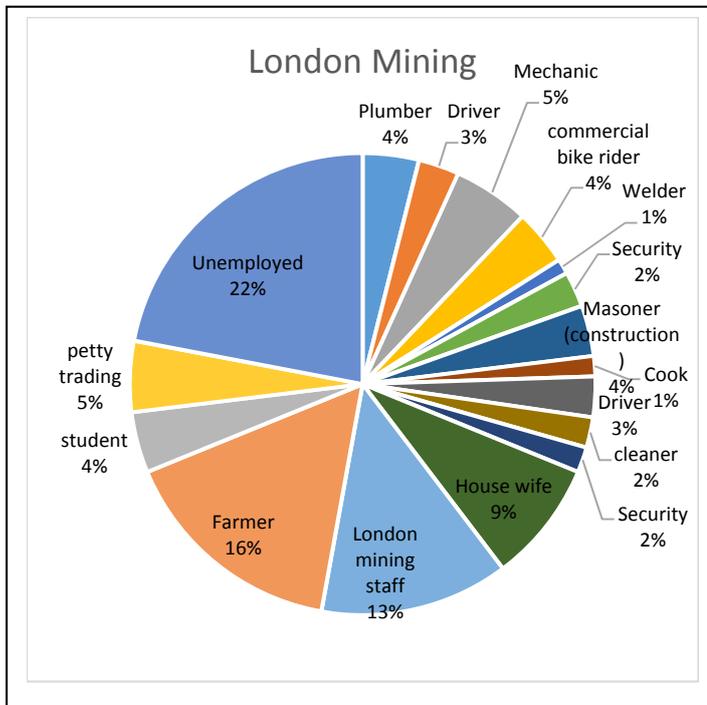
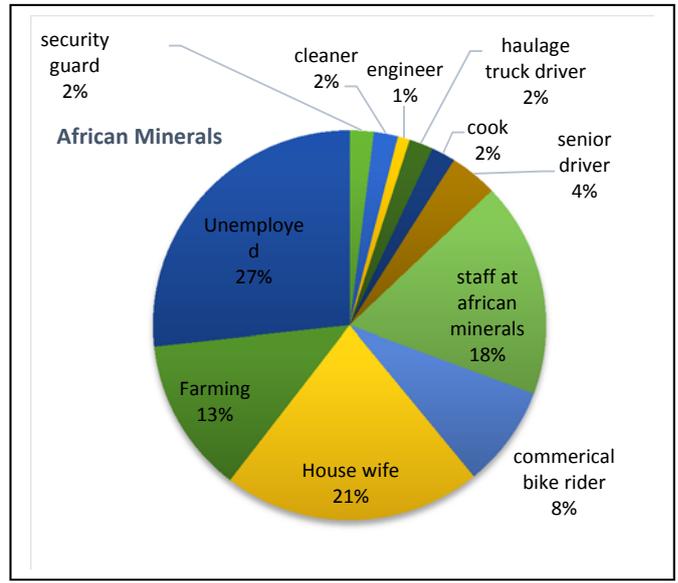
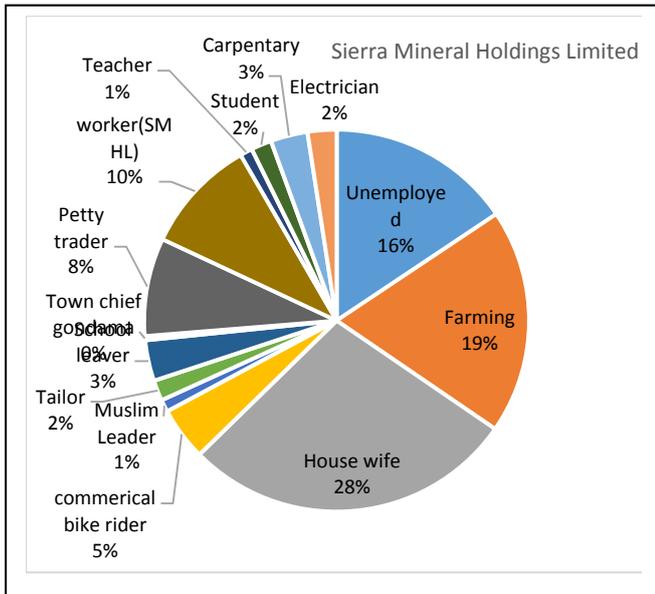
Sierra Rutile
community
football team.



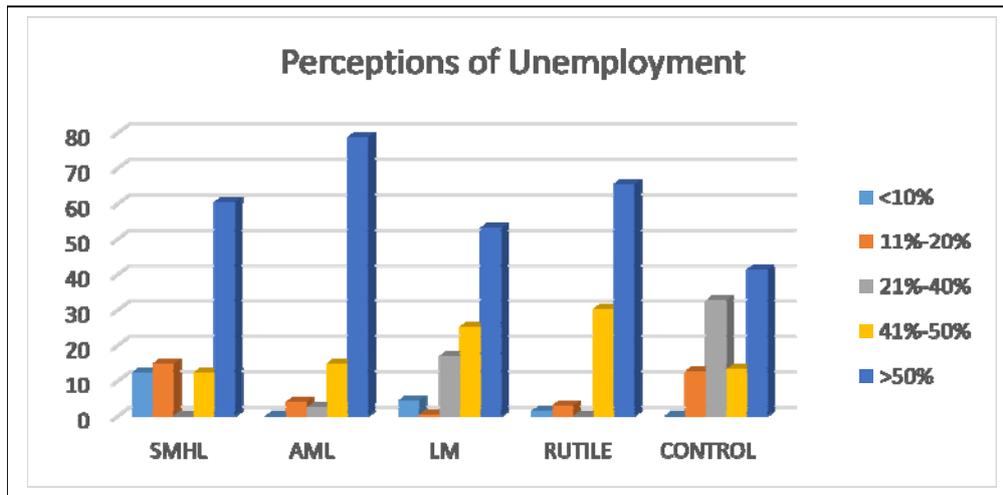
Local
community
leader's house.
Identity
protected so
cannot specify
exactly which
community.

APPENDIX SIX : SUMMARY DATA ANALYSIS OF SURVEY DATA

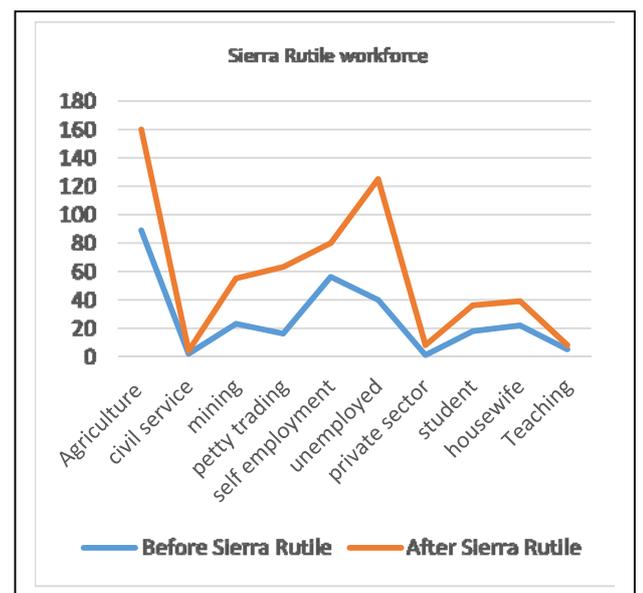
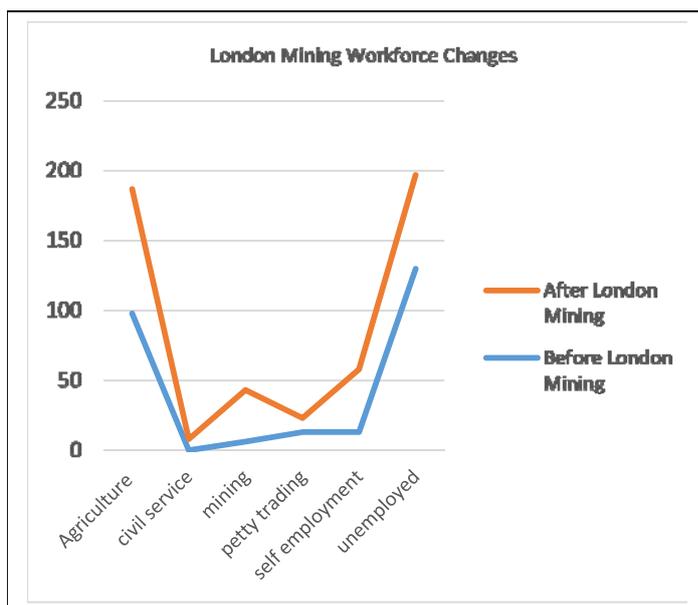
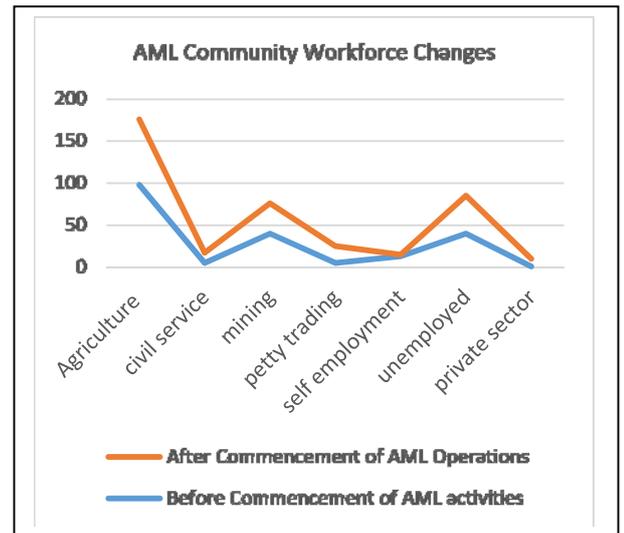
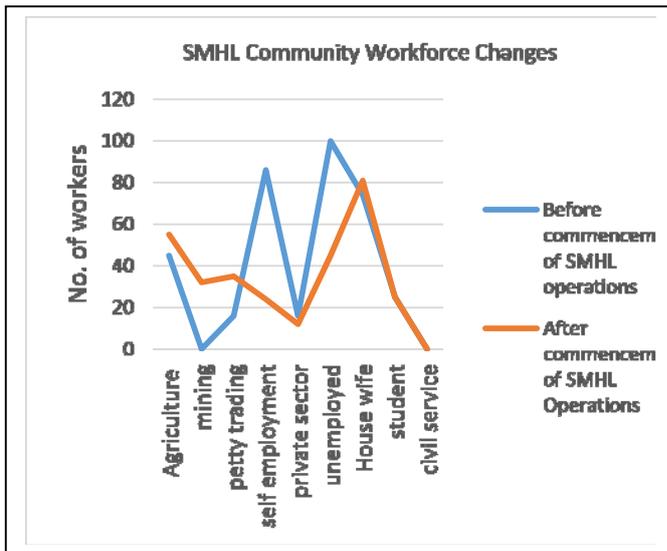
Comparison of Occupational Diversity



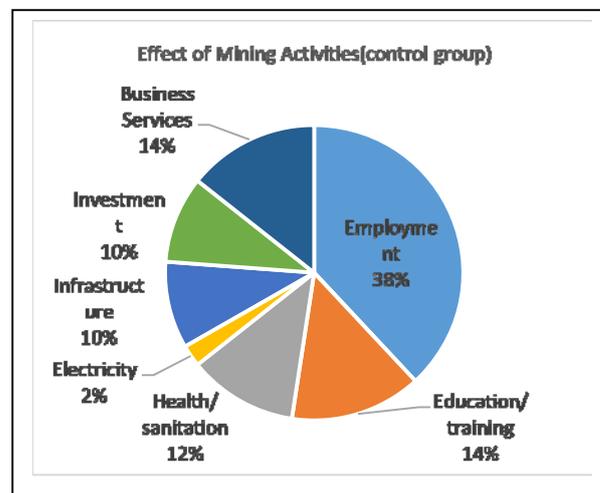
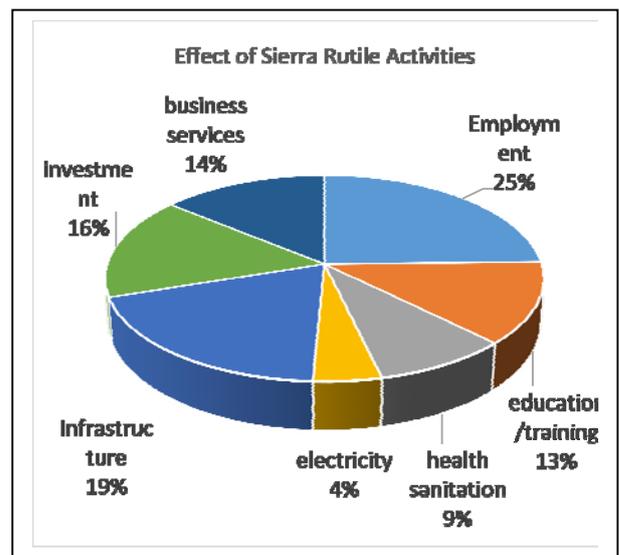
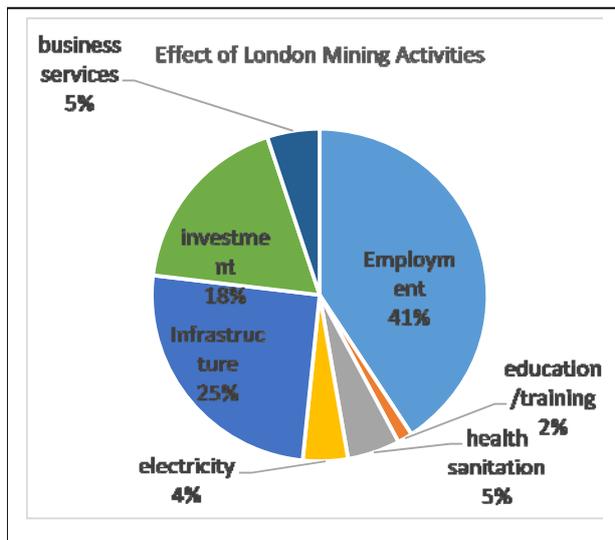
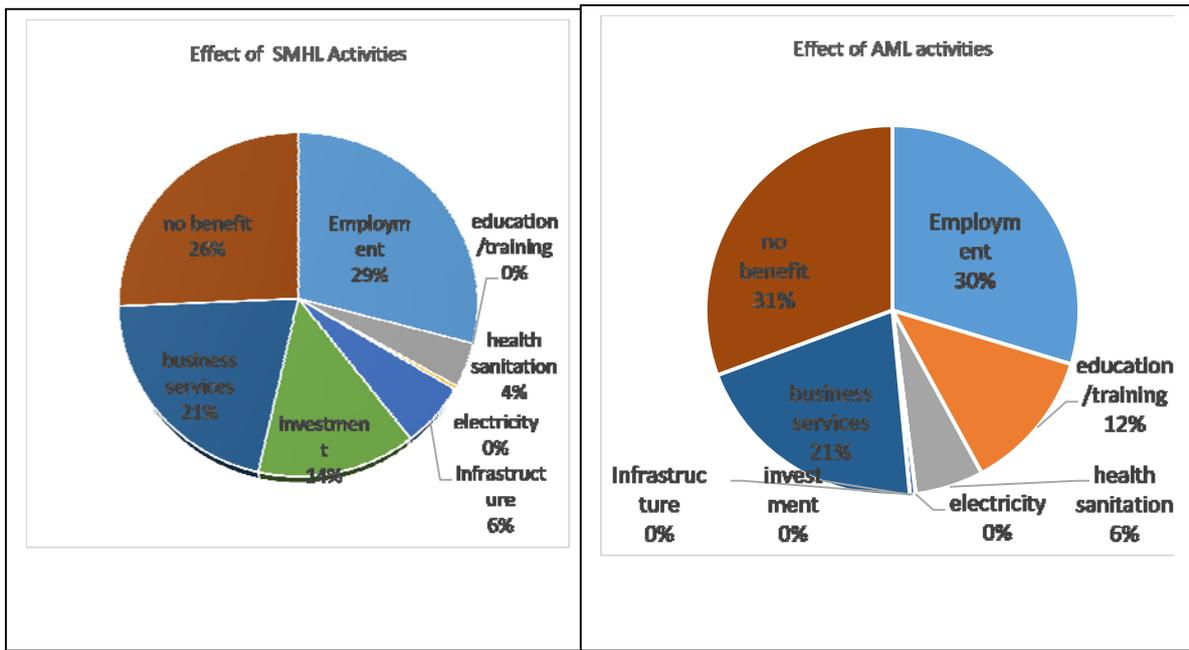
Comparism of Unemployment Perceptions



Comparism of Workforce changes



Comparism of Effects of Mining Activities



Comparison of Education Levels

