A STUDY OF BANK DEVELOPMENT, ECONOMIC GROWTH AND UNEMPLOYMENT IN SUB-SAHARAN AFRICA

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Abstract

This thesis focuses on unemployment, development in the banking sector and growth in Sub-Saharan Africa. It comprises two distinct empirical chapters with specific interests. The first investigates the distinctive unemployment issues that plague African economies and their relationship with economic growth, which has increased slightly in recent years. The second empirical chapter focuses on bank development, market structure and the role of institutions in increasing economic growth which is a topic that has been limited in literature for Sub-Saharan countries as a whole.

In general, the thesis finds support for the argument that increased growth is necessary for reducing unemployment. The first empirical chapter finds evidence that growth in the economy reduces unemployment with greater effect in non-oil producing countries. Also, human capital accumulation significantly reduces unemployment only in non-oil producing countries. Oil producing countries are probably capital intensive and the governments of these countries are not focusing on creating jobs, due to income coming from oil. In this thesis, panel fixed effects and Dynamic Panel Technique (GMM estimation method) were used. Results obtained from the GMM estimation were very similar to those from the fixed effects method. The second empirical chapter shows that development in the banking industry through an efficient channel of transmission of bank services, cause an increase in economic growth. Also, the structure of the banking market, measured by the Herfindahl–Hirschman Index significantly affects economic growth. Specifically, banking market concentration in Sub-Saharan Africa stimulates growth, due possibly to easing firms' access to credit.

Dedication

To my mum, I love you so much

To God Almighty who strengthens both of us, to him be all glory and honour

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My heartfelt appreciation goes to God Almighty for the successful completion of this study. He has been my source of strength and guide throughout this journey.

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CHAPTER 1: INTRODUCTION

1.1 Background of the Study

Economic growth in Africa has long been disappointing and remains below the level required for these countries to meet the target established in the Millennium Development Goals (MDG) of reducing poverty by the year 2015. Despite the recent increase in growth rate, the region still has low per capita income and high poverty levels compared to other developing countries. In recent years, countries in North Africa have done a little better than the rest of the continent.

Africa is comprised of 52 countries and divided into two regions, North Africa and Sub-Saharan Africa. North Africa consists of five countries, namely Algeria, Egypt, Libya, Morocco and Tunisia. All the other countries are in Sub-Saharan Africa[1], also known as SSA. The total population in Sub-Saharan Africa is about 875 million as at 2011, according to a World Bank report published in 2012. The region is also home to the 10 poorest countries. The region ranks high on the nine corruption indexes and low in economic development. Sub-Saharan Africa is also considered to be the riskiest region in the world in which to invest, this explains the low capital inflows into the region (Collier and Gunning, 1999a). The investment rate was not only low but has declined over the last 40years. Investment rates were always below 15%, according to a regional World Bank report. Figure 1 in Appendix-I shows the comparison of investment rate between SSA, OECD and East-Asian economies. Public investment also tends not to be

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[1] Sub-Saharan countries include: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Democratic Republic, Congo Republic, Cote d''Ivorie, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal,, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, and Zimbabwe

productive, as projects are chosen according to political or non-economic preferences. Examples of public investment that had no impact on economic growth are the steel plant in Ajaokuta (Nigeria) and the Akosombo dam on the Volta River in Ghana. These are just two out of many examples of failed giant public investment projects.[2]

The countries in SSA have different resource endowments: there are the resource rich (oil exporting and other minerals, e.g coal) and resource poor ones. The oil exporting countries include Angola, Chad, Congo Republic, Cote d'Ivoire, Equatorial Guinea, Gabon, Ghana, Sudan and Nigeria. These countries also have different legal origins based on their colonial history, with French and English being the common legal origins. Other countries were colonised by Portugal. Likewise, the countries are in different stages of development: most of them are low income, a few are medium-income, while none are in the high-income group (World Bank, 2007). Table 1.1 below provides a short analysis of the structure of SSA economies. The region has lower per capita income, therefore it could benefit from convergence with richer countries; it also has higher aid inflows, so it is expected to benefit from aid-induced growth if good policies are implemented. Despite the slight improvement in its growth - partially due to a reduction in political conflict, promotion of good governance and more efforts at poverty reduction, SSA is still described as the slowest growing region in the world (Bosworth and Collins 2003, World Bank, 2007).

A lot of researchers have attributed the poor economic performance of African economies to lack of openness to international markets (Sachs and Warner 1997). Others, for example Easterly and Levine (1997), suggest that growth rate is associated with political instability, underdeveloped financial systems, distorted foreign exchange

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[2] See Easterly, (2001) for a description of the Akosombo dam failure.

markets, high government deficits, insufficient infrastructure and ethnic fragmentation. Collier and Gunning (1999) and Collier (2007) associate this trend with geographical and political factors, most of which can be categorised as endogenous (policy-induced) or exogenous factors.

The region has very low population density, high costs of transport, and poor market integration, which hamper the use of trade for risk sharing (Collier and Gunning, 1999b). Sub- Saharan Africa has relatively high natural resource endowments. However, these high natural resources may increase loot-seeking (rent) activities and perhaps explain the high corruption profile in the region. This further exacerbates conflict due to ethnic diversity and, as argued by Collier and Hoeffler (1998), dependence on natural resources strongly increases the risk of civil war in the region (Lewis, 2007).

Table 1. 1 Structure of the SSA Economies

Country	GDP Annual Growth % (2005-2010)	GDP per capita (2010)	Life Expectancy at birth as at (2010)	Population (2010)	Legal Origin
Sub-Saharan	5.100	637.368	54.251	853434000	N/A
Angola	13.703	1381.004	50.654	19082000	Portugal
Benin	3.917	377.040	55.586	8850000	France
Botswana	2.789	4189.437	53.110	2007000	Britain
Burkina Faso	5.533	276.200	54.924	16468000	France
Burundi	3.588	115.306	49.877	8382000	France
Cameroon	2.853	713.639	51.063	19599000	France
Cape Verde	6.748	1959.844	73.774	496000	Portugal
Central African Republic	2.817	239.519	47.618	4401000	France
Chad	3.339	275.884	49.195	11227000	France
Comoros	1.808	336.369	60.626	735000	France
Congo, Dem. Rep.	5.667	103.776	48.070	65965000	France
Congo, Rep.	5.690	1253.292	56.960	4043000	France
Cote d'Ivoire	2.124	591.068	54.742	19738000	France
Djibouti	4.774	N\A	57.527	889000	France
Equatorial Guinea	8.233	8654.537	50.841	700000	Portugal
Eritrea	-0.113	131.796	60.994	5254000	Britain
Ethiopia	10.638	220.891	58.715	82950000	Britain
Gabon	2.735	4180.766	62.287	1505000	France
Gambia, The	3.736	354.600	58.160	1729000	Britain
Ghana	6.484	358.980	63.837	24392000	Britain
Guinea-Bissau	3.221	161.317	47.701	1515000	Portugal
Guinea	2.307	411.501	53.639	9982000	France

Country	GDP Annual Growth % (2005-2010)	GDP per capita as at (2010)	Life Expectancy at birth as at (2010)	Population (2010)	Legal Origin
Kenya	4.826	468.696	56.497	40513000	Britain
Lesotho	4.269	495.734	47.365	2171000	Britain
Liberia	6.617	155.033	56.148	3994000	Britain
Madagascar	3.330	242.678	66.467	20714000	France
Malawi	6.567	184.142	53.463	14901000	Britain
Mali	4.947	269.893	50.955	15370000	France
Mauritania	6.156	609.131	58.217	3460000	France
Mauritius	3.963	5182.144	72.967	1281000	France
Mozambique	7.472	389.764	49.697	23390000	Portugal
Namibia	3.896	2667.247	62.070	2283000	Britain
Nigeria	6.625	544.599	51.410	158423000	Britain
Niger	5.001	180.083	54.266	15512000	France
Rwanda	7.800	338.266	55.057	10624000	France
Sao Tome and Principe	5.441	N/A	64.349	165000	Portugal
Senegal	3.823	561.709	58.954	12434000	France
Seychelles	5.178	8614.120	73.034	87000	France
Sierra Leone	5.764	268.332	47.402	5867000	Britain
Somalia	N/A	N/A	50.896	9331000	Britain
South Africa	3.532	3745.650	52.081	49991000	Britain
Sudan	7.172	523.950	61.108	43552000	N\A
Swaziland	2.472	1810.231	48.343	1056000	Britain
Tanzania	6.960	456.386	57.387	44841000	Britain
Togo	2.750	285.224	56.589	6028000	France
Uganda	7.778	377.421	53.615	33424000	Britain
Zambia	6.242	432.226	48.455	12927000	Britain
Zimbabwe	-2.583	320.772	49.861	12571000	Britain

Source: World Bank (2011) *World Bank Development Indicators*

The region has much smaller countries in terms of population than other regions. SSA has a population slightly above half that of India, yet it is divided into 47 nation states. A considerable part of the population lives in countries that are landlocked. However, in contrast, Switzerland, which is also a landlocked area, benefits from good infrastructure and low transport costs, which enables it to direct its trade towards its neighbours. SSA countries direct their trade to Europe due to poor infrastructure and high transport costs[3]. Consequently, neighbouring countries are inaccessible and economically unattractive. The neighbourhood thus turns into an obstacle rather than a market (Collier and Gunning, 1999a).This trend is further strengthened by the loyalty to the colonial legacy or history.

Most SSA countries concentrate on the production of a small number of primary products as exports. The problems of functional distance and poor infrastructure are made worse by political barriers, resulting in many isolated small countries in the region. The existence of numerous states with low levels of income makes countries in Africa have radically smaller and weaker economies than those of other regions. These small countries are often economically disadvantaged, as they cannot benefit from scale economies. They are also less competitive, and are sometimes perceived as more risky (Collier and Dollar 1999). They also usually have a slower rate of technological innovation (Kremer 1993). Gallup and Sachs (1999) as well as Collier and Gunning (1999) observe that since most of the population lives far from the coast, the elasticity of growth to openness is lower and so the incentive for openness is reduced.

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[3] See World Trade Statistics (2007) for detailed information.

1.2 Unemployment and Economic Growth

The unemployment rate is the most widely used indicator of the well-being of the labour market and an important measure of the state of an economy in general. The equilibrium unemployment rate, which is sometimes referred to as structural unemployment or natural rate of unemployment (Calmfors and Holmlund, 2000), can be determined by two broad sets of factors. The first is the functioning of price and wage formation whilst the second is search and matching frictions in the labour market. Generally, in the short run, unemployment is expected to fluctuate around the equilibrium rate. The traditional hypothesis is that fiscal and monetary policies may affect cyclical fluctuations in unemployment but probably not the equilibrium rate. However, there are also arguments that movements in the actual unemployment rate may affect the equilibrium rate.

In popular discussion, a higher rate of economic growth also implies lower unemployment. This is true in the short run as higher employment indicates higher output. A more challenging issue is how unemployment is affected by a change in the long term growth rate of a country. Recent data on the evolution of unemployment is only readily available for South Africa and Mauritius. In South Africa, despite the modest drop in output, the scale of job losses was far greater than for other countries in Sub-Saharan Africa, Mauritius however, increased its job creation as at 2009[4]. It can be speculated that the rest of the region experienced a slight improvement in job creation as a result of growth increase (see Table 1.2).

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[4] See Regional Economic Outlook for Sub-Saharan Africa (2012) for full details

Table 1. 2-Sub-Saharan Africa Macroeconomic Aggregates (2004-2012)

	2004-08	2009	2010	2011	2012
Real GDP Growth *(% change)*	6.6	2.8	4.9	5.5	5.9
Inflation, end of period *(% change)*	8.7	8.3	7	8.1	6.7
Fiscal balance, *(% of GDP)*	0.1	-7.2	-5.6	-3.2	-2.3
Current account balance *(% of GDP)*	0.8	-2.3	-2.2	0.5	0.5
Reserves Coverage (*months of imports*)	4.6	5.0	4.5	5.0	5.5

Source: IMF (2012), *Regional Economic Outlook - Sub-Saharan Africa*

Empirical studies on unemployment and economic growth have applied mainly time series analysis. In examining this relationship very few studies have focused on Sub-Saharan Africa. To the best of my knowledge, the majority of the work done has been concentrated on South Africa. As economic growth influences unemployment through business cycles and creation of more jobs, authors have turned to analysing this relationship by using panel data methods. In Chapter Two, as opposed to using time series analysis, this research uses dynamic panel data analysis. The reason behind this selection is as follows: it is assumed that growth is an endogenous variable; it is therefore robust to use dynamic panel analysis in growth regressions. Also, the GMM estimation is specifically designed to address econometric problems caused by unobserved country-specific effects.

1.3 Banking and Economic Growth in Sub-Saharan Africa

The previous century experienced the upsurge of theoretical and empirical studies that document the importance of finance to economic growth. These exertions started with Schumpeter (1911), Goldsmith (1969) and Shaw (1973), to mention a few. Their findings suggest a positive and significant relationship between financial development and growth. Other empirical works suggest that financial development is a catalyst for economic growth (Levine, 2004; Demetriades and Andrianova, 2004; Ang, 2008).

The increasing role of banks in the economic development of Sub-Saharan African has now been recognised. The recent reforms in the financial system of most of the countries have also put them on the same financial scale as some developed countries in the world. South Africa being Africa's biggest economy, has - since the advent of democracy in the 1990s - embarked upon wide ranging financial reforms both in the banking sector and stock market system. Nigeria and Botswana have also had major financial reforms in which the banking system is considered as sound. Stiglitz (1985) and Singh (1997) tend to support the banks' role in the growth process. Financial markets in the region are heavily regulated, with bank lending often directed to the government, or to priority sectors. There is very limited financial intermediation with little or no competition among banks. Weak economic growth explains a lower saving rate and higher capital flight from Africa (Collier, 2007). This, coupled with high poverty levels and underdeveloped financial systems, makes households use assets for purposes of consumption smoothing rather than investment. Thus, households are trapped in low income, high liquidity equilibria (Dercon, 1997).

Collier (2007) observed that growth has accelerated in the last few years. However, the concern is whether this is a temporary or permanent trend? Demetriades and Law (2006) find that in low-income countries the influence of financial development on growth is weak; they therefore conclude that more finance without sound institutions may not succeed in delivering long-run economic benefits in these countries. To examine the hypothesis of bank development influencing economic growth, this research uses the GMM estimation method. The findings in this paper suggest that Sub-Saharan economies will benefit from sound financial systems which will increase growth. The methodology applied in Chapter Three enables the extraction of biases from the models and allows for accurate results.

1.4 Objectives of the Study

This thesis focuses on Banking Development, Growth, Unemployment and Bank Market Structure in Sub-Saharan Africa. It uses panel data estimation and sets out to contribute to the literature as follows:

(a) By empirically investigating the impact of economic growth and human capital accumulation on unemployment in the region.

(b) By studying the effect of banking sector development and structure in increasing economic growth

1.5 Motivation of the Study

Despite the overwhelming theoretical proposition on the importance of finance to growth, starting with the work of Bagehot (1873), Schumpeter (1911), Gurley and Shaw (1955), Goldsmith (1969) and McKinnon (1973), many economists still differ about the role of the financial sector in economic growth, such that some pioneers of

development economics (Meier and Seers, 1984; Lucas 1988) all dismiss finance as a determinant of growth (Levine 2004). Robinson (1952) argues that where enterprise leads finance follows, suggesting that finance passively responds to demand for economic growth; yet others like Merton (1987) and King and Levine (1993) strongly argue that financial development impacts actively and positively on economic growth.

This thesis focuses on Sub-Saharan Africa, which is a region of the second largest continent in the world. Sub-Saharan African economies are the poorest in the world according to the World Bank report on economic indicators (2012). It is therefore imperative to study how the growth increases in the region over the last decade, albeit moderate have impacted on unemployment and how bank and financial reforms have influenced economic growth. The majority of previous studies in Africa have focused on single economies; this thesis however examines the economies of the countries in Sub-Saharan African.

The World Bank (2007) explains that, although the African financial system is confronted with a lot of challenges, it has been recording accelerating growth over the past years. It shows that the indicators of financial development have steadily increased and the real private sector has been growing at an accelerating rate in the past decades. This is an indication that financial development in Sub-Saharan Africa has the potential for promoting rapid economic growth.

Different empirical studies have reported contrasting conclusions. While some have found statistical evidence of uni-directional causality from financial development to growth, others have reported evidence of reverse causality from economic growth to financial development and also a bi-directional causality. While some studies report positive impacts of financial development on growth (King & Levine 1993), others suggest a negative effect (Calderon & Liu, 2003) and yet some do not find any significant impact. This suggests that the issue is inconclusive in literature and that a study in this regard would further enlighten our understanding of the relationship between the two, enabling policy makers to make better policy decisions and give priority to ensuring a sound financial system.

Reforms in the financial system can also create more jobs in the economy directly and indirectly. In the early 2000s, banks were the major employers of labour in Nigeria: 60% of the labour force was in the banking sector. This was as a result of the government opening up licences for bank operations. An effective and sound financial system would mean there is easier access to credit and good quality of information on prospective borrowers. In other words, lending will be channelled to credible and resourceful investors and this might result in more job creation reducing unemployment and fostering growth.

1.6 Contribution of the Thesis

In growth literatures, three theories are prevalent with different policy implications. First is the neoclassical theory, which emphasizes the role of physical capital and technology. Second, the endogenous theory emphasizes the importance of human capital and lastly the finance theory, which highlights the importance of finance in the development process. This thesis contributes to the literature by analysing the effect of sustained economic growth in reducing unemployment and the impact of human capital accumulation on unemployment. Using a panel dataset of 40 African countries the researcher analyses this relationship, paying particular attention to the resource endowment of the sample countries by grouping the countries into oil producing and non-oil producing countries. Grouping the countries further contributes to the literature by identifying the role and importance of human capital accumulation across differently endowed economies.

In Chapter Three, the thesis contributes to the literature by assessing the importance of bank development and structure of the banking sector market in promoting economic growth in the region. The results from this chapter suggest that African economies will benefit from having banking sector reforms that improve the services and products offered and promote free entry and enhance competition into banking markets. This sound banking system should increase foreign and private investment in the economies, causing growth and subsequently development in the country. It is suggested that the endogenous growth theory and the associated finance theory are the most suitable growth path for countries in Sub-Saharan Africa. The transmission technique for this growth path embraces human capital growth and development in the financial markets, which includes investment in Research & Development.

1.7 Plan of the Thesis

This thesis is a study of the effect of bank development on economic growth and how this growth influences unemployment in some selected countries in SSA. It consists of four chapters: an introductory chapter, two empirical chapters and a concluding chapter. Chapter One focuses on the introduction of the thesis. It comprises the general background of the study and a brief outline of economies in Sub-Saharan Africa. Chapter Two analyses the role of economic growth in reducing unemployment and how human capital accumulation impacts on unemployment in oil and non-oil producing economies in the region. Two methods of estimation are used in this chapter to examine the robustness of the results: the fixed effects panel estimation and the dynamic panel data estimation. Chapter Three provides empirical analysis of bank development increasing economic growth. The motivation of this chapter was to examine if the recent reforms in the financial sector in the region had contributed to the increased growth experienced in the region. The chapter also uses the dynamic panel data estimation technique suggested by Arellano and Bond (1991). Chapter Four presents the summary and discussion of the overall findings of the thesis. It gives policy implications and recommendations and also offers suggestions for future research.

CHAPTER 2: UNEMPLOYMENT AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICA

2.1 Introduction

Economic growth in Sub-Saharan Africa has been reasonably strong over the past decades. From the 1960s to the 70s there was rapid growth; however from the 1970s up until the 90s there was little or no growth. The late 1990s was a period where the majority of the countries in Sub- Saharan Africa (SSA) started a modest recovery but this was still very low compared to other developing countries outside the continent[5]. Whilst many of these countries have experienced notable growth before and after the global and economic crises in 2008 and 2009, however, although the growth rate is still increasing for most countries they might be vulnerable to external shocks**.** The challenge facing African countries is not only to accelerate growth but also to improve the unemployment level[6]. Plausible estimates suggest that, on average, every single year of the current decade, between seven and ten million additional men and women would be looking for work in one of the multiple labour markets (Fluitman, 2001). There are not enough jobs for all the currently unemployed or those newly joining the labour market.

In the last decade, according to the African Union Commission (2010), hereafter referred to as AUC, Sub-Saharan countries reduced unemployment as a whole by a mere 0.8 per cent and the figure for those in paid employment remains below 20 per cent. The livelihood of the population depends on informal sector employment; the region therefore experiences an alarming unemployment rate compared to other

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[5] Report given by the African Union Commission
[6] Committee of Experts - the 3rd Joint Annual Meetings of the AU Conference of Ministers of Economy and Finance

developing nations. Conventional theories of economic growth and unemployment[7] believe neither that neither long run economic growth influences unemployment nor that unemployment has any effect on economic growth. The most important growth drivers needed for sustainable growth are human capital, technology and increased productivity. In models of economic growth[8], human capital in the form of educational attainment or school enrolment has been given a central place in growth theories. In other words, investment in human capital through education stimulates growth through better productivity of resources.

The aim of this chapter is to better understand the interplay between economic growth, human capital development and unemployment in Sub-Saharan Africa. Does increased growth reduce or increase this unemployment level and to what extent is this effect significant? It is of interest to note that African countries have much higher unemployment rates than developed or European nations. Also, this chapter examines if there is any significant difference in the findings if the countries are separated into oil producing and non-oil producing countries. The analysis presented in this chapter is based on the hypothesis that sustained growth in major sectors of the economy can indeed reduce unemployment.

The findings of this chapter show a significant negative effect of growth on unemployment. The result show that both variables that proxy human capital have no significant effect on unemployment in the overall data. The result is slightly different when countries are grouped into oil and non-oil producing. Domestic Credit has a positive significant effect on unemployment. These findings are broadly consistent with

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[7] See Solow (1956) and Layard et.al (1991)

[8] Solow Model with human capital recognising skilled and unskilled labour in different economies and Lucas Model via stock of human capital represented by knowledge which is gained through studying

Zagler (2006), who found a significant negative effect between unemployment and economic growth, and stated that the unemployment experienced during increased growth is structural. The findings are also consistent with Evans and Leighton (1990) who found that unemployment can be positively associated with a greater propensity to start a new firm.

Aghion and Howitt (1994) stated that the cost associated to increase in economic growth is structural unemployment; as structural change cuts jobs in one firm, it creates jobs in another. Firms producing a product in a declining market will lay off workers; workers specializing in a particular mode of production will lose their jobs as new modes of production make their qualifications redundant. Unless these workers re-qualify and are matched to new jobs or matched to a new technology, they will suffer periods of unemployment.

By focusing on Sub-Saharan African countries, the chapter provides recent actual evidence of the effect of growth on unemployment for both oil producing and non-oil producing countries, considering that most countries in this region are plagued with low quality data. This chapter also adopts tertiary enrolment and literacyrate as proxies for human capital. Tertiary enrolment, which gives the number of people enrolled in a tertiary education, is assumed to be a better proxy for human capital than literacy rate because being literate does not necessary mean you have formal education. Tertiary enrolment also has more observations than literacy rate. The remainder of this chapter is organised as follows: Section 2 outlines the review of relevant literature. Section 3 presents the data and estimation technique. The result of the model is given in Section 4, whilst Section 5 presents the conclusion and recommendations.

2.2 Review of Previous Literature Review

2.2.1 Theoretical Review

In many Sub-Saharan countries, not more than 10% of the population are employed. In spite of the increase in growth experienced by a few of these countries (South Africa, Nigeria, and Cameroon) employment opportunities are few and far between as a result of firms' and government organisations' unwillingness to hire new people. Most people therefore end up being self-employed or working for family members, and the majority of the work is being done on a low level productivity. Implementing policies that channel good growth into job creation and ultimately reduce unemployment has always been an issue for African countries; very few countries in the region (Ghana, Botswana, and Mauritius) have been able to get it right. The policies are either not implemented or when they are implemented they do not actually yield much results in terms of job creation (AUC 2010). This has resulted in labour markets in developing countries exhibiting some peculiar characteristics.[9]

With regard to the issue of unemployment reducing economic growth and vice versa, the positive effect that sometimes occurs between these variables has been a major area of research in economics. These two phenomena have been theoretically and empirically tested, but not in much depth. Calmfors and Holmlund (2000) suggested four main aspects to this relationship. The first is that exogenous changes of the rate of growth can affect unemployment; the second, that exogenous changes of the type of

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[9] The first is that many people who would have remained in open unemployment take up low wage jobs or self employment while still hoping to pick up formal sector jobs; second is that the unemployed in the labour market do not enjoy any social benefits or unemployment insurance from the government; third, unemployment rates in most of the countries are usually very low due to disguised employment or underemployment in the informal sector; and fourth, employment or unpaid employment in family enterprises have a disproportionate share in total employment.

growth can affect unemployment; the third is that changes in labour-market institutions can affect the growth rate indirectly via changes in unemployment; and lastly changes in labour-market institutions can affect both unemployment and growth directly, but through different mechanisms[10].

These ideas are useful in better understanding the relationship that exists but no empirical evidence has been provided. Another aspect of the relationship which was not mentioned is the effect of long term growth on unemployment, which is the main question this paper attempts to answer. Although the authors raised a similar question by asking how unemployment will be affected by a change in the long-term growth rate that is, a reduction in the growth rate, the relevance of the issue was only mentioned and not empirically tested. Economic theory of growth suggests that higher productivity - implying an economy producing at a high capacity or investing more in foreign assets and exports rather than imports - could lead to either job creation or job destruction.

Calmfors and Holmlund (2000) however completely disagree with this notion; they believe increase in productivity does not affect unemployment. They argue that there should have been trend-wise increase or decrease in unemployment over very long periods. Their interpretation is that the increase in productivity increases wages due to an upward shift in the wage setting schedule and not unemployment. In supporting this argument, Blanchard (1997) states that long run economic growth has no effect on equilibrium unemployment. Onaran (2008) concluded that increased growth does not necessarily increase employment levels. Out of eight countries examined, only one, Romania, came up with a positive and significant effect of increased growth increasing

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[10] For detailed information please see Calmfors L. and Holmlund B. (2000) 'Unemployment and Economic Growth: A Partial Survey'

employment in the country. His results could be explained by assuming the governments of other countries in his sample have not being able to develop strategies or policies that would yield increase in employment as a result of increase in economic growth. Theoretical studies that have also investigated the long run effect of growth on unemployment have found that a negative relationship exists. Pissarides (1990) shows that growth increases as a result of higher productivity, which also increases the rate of return on job creation. In his model unemployment rate and growth rate are negatively correlated.

Theoretically, a country with high and sustainable growth should experience very low levels of unemployment (the capitalisation effect) but there is also an alternative theory that higher growth could mean fewer jobs thereby increasing unemployment (the creative destruction effect). Aghion and Howitt (1994) suggest that the unique equilibrium unemployment rate can be represented as an inverted U-shaped function of the growth rate whenever the entry cost is positive but sufficiently small. They identified two competing effects of growth on unemployment. On one hand, an increase in growth increases the returns from job creation, which reduces the unemployment rate (the *capitalization effect).* On the other hand, an increase in growth shortens the duration of job matches. Because shorter duration of job matches directly raises the job separation rate and indirectly discourages job creation (the *creative destruction effect),* a higher growth rate could increase the unemployment rate.

Wang et al. (2012) strengthened the argument of having good growth coexisting with high unemployment in developing countries. A North-South trade model was created between a (large) developed country and a (large) developing country, taking into account labour reallocation between rural and urban areas. The trade model consisted of two basic goods: agricultural and manufactured goods. They assumed perfect competitive markets. The two countries have the same international capital rental price and capital moves freely. It is also assumed that the North's total factor productivity (TFP) is higher than the South's. The South produces only one type of agricultural product mainly in the rural area and the North produces only manufactured goods. They proved theoretically that an improvement in the TFP in the manufacturing sector of the South will mean a reduction in the range of commodities manufactured in the North, and therefore a trade deficit. This further implies a reduction in wages and comparative advantage. They also suggested that in equilibrium, the unemployment in urban areas in the South will rise as a result of an improvement in the manufacturing sector, and this they claimed is due to labour reallocation mechanism in the North-South trade set-up[11].

These ideas are interesting because an improvement in TFP in the manufacturing sector should ideally boost employment in urban areas in the South. The authors have justified why they think this is the case but there are many other factors - like more firms springing up, thereby making the wage rate reduce instead of increasing as stated in the theory, and labour demand almost equal supply. If this happens unemployment either reduces back to its natural rate or further reduces. The authors have mainly focused on the Southern trade model even though it is a two sector model. The North trade sector has not been explored as much and there is no tangible reason for high unemployment

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[11] For more details see Wang et al. (2012) 'The coexistence of High Unemployment and Good Economic Performance in Large Open Developing Countries'

in the North aside from the wage decrease, which does not necessarily cause unemployment. It is an interesting paper that needs further research on why the North (large) developed country faces high unemployment.

2.2.2 Growth Models

Solow Growth Model

Solow (1956) presents a neoclassical growth framework based around two equations, a production function and a capital accumulation equation, and also on the assumption that prices are fully adjusted and have three factors determining the output: labour, capital and technology[12]. The production function is assumed to have the Cobb-Douglas form and is given by

$$Y = F(K, AL) = K^{\alpha}(AL)^{1-\alpha} \tag{1}$$

Where K is physical capital, A is the technology variable, and L is labour. I assume that

A is growing at a constant rate, therefore $\dfrac{\dot{A}}{A} = g \leftrightarrow A = A_0 e^{gt}$ where g is a parameter representing the growth rate of technology. As a consequence, output per worker is:

$$y = k^{\alpha} A^{1-\alpha} \tag{2}$$

The equation that describes capital accumulation is given by:

$$\dot{K} = sY - dK \tag{3}$$

Where $\dot{K}$ is the change in capital stock; sY is the amount of gross investment and dK is the depreciation that occurs during the production process. This suggests that when accumulation of capital is sufficiently large, a change in output per worker will lead to a

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[12] An important assumption in this model is that technology is exogenous

change in the ratio of capital per worker. The model assumes a constant return to scale and a positive but diminishing marginal productivity of capital without technological progress. This assumption in the model means the economy can reach a steady state where both output and capital are constant. However, in the short run, an increase in savings rate will have a positive effect on output, but this is only temporary because a new steady state will be reached and output and capital will arrive at a new constant level. However, in the long run after all adjustments has taken place, total saving is used to make capital grow exactly at the same rate as population, implying that both new and existing workers get the same capital: i.e. capital per worker is the same. Thus, saving only affects the level of output and not its growth rate.

Daveri and Tabellini (2000) found that higher employment means higher aggregate income in the economy. With a given savings rate, higher employment therefore means higher saving and that a given capital stock is combined with more labour. This then raises the return on capital and hence the savings rate as well. Higher aggregate income together with a higher savings rate means more capital accumulation and thus higher growth. Arguing against the belief of higher employment leading to higher growth through savings were Calmfors and Holmlund (2000), who suggested that these theories neglect free capital mobility and capital accumulation which does not depend on savings.

Mankiw et al. (1992) evaluated the empirical implications of the Solow model and concluded that it performed very well but needed to be improved. They came up with a model that included human capital; that is, recognizing the fact that labour in different economies may possess different characteristics, e.g. level of education, level of skilled labour. The new model is represented by a Cobb-Douglas production function:

$$Y = K^\alpha (AH)^{1-\alpha} \tag{4}$$

A represents a labour augmenting technology that grows exogenously at rate g, H represents the number of individuals who spend time learning new skills (u) and the amount of raw labour (L) used in the production process. Therefore

$H = e^{\psi u} L$. Where Ψ is a positive constant and if u = 0, it means all labour is unskilled. If u increases by one unit, it effectively increases the units of skilled labour H. Suppose the increase in u is one additional year of schooling and suppose Ψ is 0.10, H will rise by 10 percent. This proportional effect is driven by the exponential e in the equation. The equation above supports the school of thought that finds an additional year of schooling increases the wage earned by an individual. Output per worker then becomes:

$$y = k^\alpha (Ah)^{1-\alpha}. \tag{5}$$

There are further extensions to the Solow model, which are not discussed in this paper. The core of the model suggests that countries that have high economic growth invest in physical capital, high levels of technology and accumulating desired skills ($h = e^{\psi u}$). They also have low population growth rates.

Endogenous Growth Model

The body of literature that challenges the assumption of Solow's (1956) model came to be known as the endogenous growth model. The endogenous growth model assumes that both capital and output can grow indefinitely and the growth rate is not exogenously determined, but rather determined through savings and investments. The model presents a positive relationship between an economy's returns to scale and productivity. This growth in productivity offsets the diminishing returns assumed by the Solow model, thereby making the production function linear, indicating that there is no steady state. The models are often referred to as $Y = AK$ models simply because of the assumed linear relationship between capital per worker and output.

$$Y = AK \tag{6}$$

Where $A > 0$

In the above equation there are no decreasing returns to scale in capital stock. The AK model can be considered to be a reduced form of a more elaborated growth models. K in the model can include knowledge spillovers, learning-by-doing, human capital, and public infrastructure; A represents total productivity.

Capital is accumulated as individuals save and invest some of the output produced in the economy rather than consuming it; it depreciates at a constant proportion rate δ and consequently grows at the following rate:

$$\dot{K} = sY - \delta K \tag{7}$$

The marginal product of each unit of capital is A, which does not depreciate as additional capital is put in place. Diving both sides of equation (7) by K

$$\frac{\dot{K}}{K} = s\frac{Y}{K} - \delta \tag{8}$$

From the production function $\dfrac{Y}{K} = A$

Therefore, $\dfrac{\dot{K}}{K} = sA - \delta$

$$\text{(9)}$$

Taking logs and derivatives of the production function, the growth rate of output and capital equals giving the equation below:

$$g_y = \frac{\dot{Y}}{Y} = sA - \delta \tag{10}$$

The equation above suggests that government policies that increase the investment rate of an economy will in effect permanently increase the growth rate.

The AK model has been further extended by many economists [13] to include labour and physical capital. The main distinguishing factor here from the Solow model is that the effect of labour input is determined by the stock of human capital, which means that a more skilled individual is assumed to be able to produce more output than an unskilled individual. This human capital mainly can be achieved through education, training and experience. Therefore gives equation 11 below:

$$Y = A_t K_t^{\alpha} H_t^{1-\alpha} \tag{11}$$

Where K_t is the physical capital and H_t is human capital; growth is therefore determined by

$$Y_t / Y_t = A_t / A_t + \alpha K_t / K_t + (1-\alpha) H_t / H_t \tag{12}$$

It is assumed that different types of capital accumulates according to

$$K_t = S_k Y - \delta K$$

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[13] The Lucas Model extends the AK model with human capital accumulation. The Romer model extends the AK model by including physical capital, labour and technological progress which is driven by Research and Development.

$$\text{H}_t = S_H Y - \delta H$$

Depreciation is assumed for the two capitals; it therefore means that capital output ratio will be

$$X_k = K / Y \qquad\qquad (13)$$

$$X_H = H / Y \qquad\qquad (14)$$

Growth rate of the two capital inputs as functions of the relevant capital output ratio will now be:

$$\text{K} / K = S_K / X_K - \delta \qquad\qquad (15)$$

$$\text{H} / H = S_H / X_H - \delta \qquad\qquad (16)$$

Reasonably, government investment in human capital accumulation through high levels of education and training systems stimulates growth through better productivity of resources and can reduce unemployment. It can also provide incentives for new entrepreneurs and increasing growth in labour-intensive sectors like manufacturing, agriculture, construction, textile and services. For sustainable growth, technological change and private entrepreneurship are very important. On the other hand, the accumulation of physical capital and infrastructure will not yield good results unless local technological capabilities are upgraded.

Fuente (2007) presented a model similar to the one in the Cobb-Douglas Production Form. The production function given is:

$$Y_{it} = A_{it} K_{it}^{\alpha k} H_{it}^{\alpha h} L_{it}^{\alpha l} \qquad\qquad (17)$$

Where Y_{it} denotes aggregate output of country i at time t, L_{it} is the level of employment, K_{it} is the stock of physical capital, H_{it} is the average stock of human capital per worker and A is an index of technical efficiency or total factor productivity (TPF) which summarises the present state of technology, omitting factors such as climate, endowments of natural resources, geographical location and institutions. This model simply states that growth in the economy is a function of the number of people employed, the stock of human capital, which is the level of schooling, the physical capital available to a country and technical efficiency. He assumes constant returns to scale for all variables except *A;* per capita production function relating to average productivity and stock of capital per worker can be defined. In other words,

if $Q = \dfrac{Y}{L}$

$$(18)$$

that is, output per worker and

$Z = \dfrac{K}{L}$

$$(19)$$

the stock of capital per worker, dividing both sides of equation (17) by total employment, L, equation 20 is obtained

$Q = A Z^{\alpha k} H^{\alpha h}$
$$(20)$$

The equation above explains the growth rate of total factor productivity. By introducing labour and other externalities into the model, Fuente (2007) has been able to show that investing in education has a sizeable effect on growth. He pointed out that weakness in previous schooling data has been the reasons why many researchers do no really agree with human capital (education) influencing economic growth. In his (Fuente 2007)

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schooling data, he corrected for measurement bias because this (measurement errors) always induces a large bias in the human capital coefficients.

Other endogenous growth models include the work of Pissarides (1990) and Postel Vinay (1998); they found that technological progress helped to reduce unemployment due to the capitalization effect. Increase in growth brought about more firms being created therefore more jobs created. It was concluded that growth and technological progress had a significant role in reducing unemployment.

2.2.3 Empirical Review

Much of the empirical literature on the effect of economic growth on unemployment has focused on OECD countries, Europe, and Asia using aggregate time series analysis. African countries tend to exhibit slightly different characteristics with empirical evidence and economies policies on growth and unemployment. Topel (1999) finds time series evidence of a positive association of growth on unemployment within the Solow framework with human capital. In his analysis human capital raises subsequent growth by producing technical change. Aggregate output is produced using physical capital (K) and human capital (H) via:

$$F(K, AH) \tag{21}$$

where A denotes state of labour augmenting technical progress. He assumed constant returns to scale and competitive markets; the rate of change of output for country i at time t is given by the equation;

$$y_{it} = \alpha_{it} k_{it} + (1 - \alpha_{it}) h_{it} + p_{it} \tag{22}$$

where *y, k, h,* and *p* are proportionate rates of change of output, physical capital, human capital and TFP respectively, and α is capital's share of national income. The model is limited with the assumption of constant returns to scale; the countries selected are developed countries that might be experiencing increasing returns.

Economic growth and employment was examined in Sub-Saharan Africa using time series analysis by Yogo (2008); he showed that the positive effect of growth is dependent on how labour markets work, which is similar to the findings of Topel (1999). He concluded that this effect is not very strong and called for reinforcement of growth and the setup of pro investment incentives.

Padalino and Vivarelli (1997) also used time series regression for G7 countries to examine the relationship between employment growth and economic growth in the Post–Fordism era and in the manufacturing sector. The conclusions was that employment increases especially in the long run if there is increased economic growth but, where there is a lag, effects take several quarters to be fully felt. However, growth in the manufacturing sector does not necessarily increase the employment level. The reason for this might be due to increase in physical capital rather than labour. A manufacturing firm can decide to use a more capital intensive approach to production either due to more efficiency or lower cost.

As economic growth may influence unemployment both through the business cycle and through its impact on the creative destruction of jobs, authors have turned attention to panel data methods. Seyfield (2005), in his analysis of economic growth and employment growth, used a state specific and pooled regression method. The ten largest

cities in the US were examined and elasticity of employment with respect to GDP was estimated to be 0.47 using pooled regression and 0.31 to 0.61 for state specific regressions. The relationship between growth and employment was estimated with a simple model:

$$empgrowth = B_0 + B_1 economicgrowth + \varepsilon$$

B_1 is the estimated elasticity which gives the employment intensity of growth. He discovered that increase in economy growth generates jobs and causes an increase in employment but this increase only lasted a few quarters. A comparison of a smaller city or cities to the large ones could give more robust results as this would mean growth could significantly improve unemployment irrespective of the size of the city or economy. In his findings economic growth does have a positive and significant impact on employment growth but after a while employment growth may take on a momentum of its own. This appears to be true of developed countries whose growth rate does not have any bearing on employment rate. It also complements Wang et al.'s (2012) theoretical result of developing countries experiencing increased growth and high unemployment levels[14].

In the analysis of how unemployment and employment respond to wages, output and international factors - international factors being exports, imports and Foreign Direct Investment. Onaran (2008), in his paper[15], used a country specific panel data analysis. His analysis was based on a profit maximising firm with a Cobb- Douglas production function:

$$Q_i = A^{\delta} L_i^a K_i^b \tag{23}$$

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[14] China, South Africa and Libya are examples of countries that have increased growth but still struggle with very high unemployment rates.

[15] "Jobless Growth in the Central and East European countries: country specific panel data analysis of the manufacturing industry.

where Q is real output, L_i is the employment and K_i is capital stock in sector i, a and b represents factor share coefficients and δ allows for factors that change the production process efficiency. Marginal productivity was substituted into the production function where real returns to labour (W/R) equals marginal productivity of labour and returns to capital (C) equals marginal productivity of capital for profit maximising firms. Output was represented with the following expression:

$$Q_i = A^\delta (L_i a/b * WR/C)^a L_i^b \qquad (24)$$

Taking logarithms and rearranging the terms, the industry's derived demand for labour is obtained as

$$InL_i = c_0 - c_1 In(WR/C)_i + c_2 InQ_i \qquad (25)$$

In the model, the cost of capital varies over time for simplicity with the assumption of perfect capital markets. This variation is captured by time dummies. The model was further extended to integrate the effect of FDI on the technical efficiency and labour intensity of production[16].

The following function forms the basis of his estimations:

$$InL_i = f(\beta_i, \alpha_i, InQ_i, InWR_i, FDIQ_i, XQ_i, MQ_i) \qquad (26)$$

His findings indicate that employment does not respond to wages, and that jobless growth occurs in the industry. However, employment responds positively to output mostly in the highly skilled industries. In the medium and low skilled industries employment had no relationship with output. His suggestions are plausible because highly industrialised countries should have low unemployment as a result of more output, because increased output should increase employment opportunities.

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[16] For more detailed explanation see Onaran (2008) "Jobless Growth in Central and East European countries"

A high unemployment rate tends to increase the employment intensity of growth and puts pressure on enterprises to raise employment, especially in low wage areas (Walterskirchen 1999). Walterskirchen's findings are very similar to those of Verdoom (1949). A strong positive correlation between GDP growth and the change in employment and unemployment was reduced due to increased growth. An increase in the growth of output of one percent results in an increase in productivity growth and in employment growth of about half a percentage point each. He further concluded that the relationship between GDP growth and change in unemployment is divided into two components: that is, those changes in employment and unemployment rates governed by economic factors and demographic influences and, secondly, by labour market policies. Walterskirchen's results strengthen the argument that increased growth can be used to tackle unemployment - which is the same argument in this chapter, although it uses a different method of estimation and different sample countries.

Swane and Vistrand (2006) examined the employment growth nexus by measuring employment using total employment and employment-to-population ratio (which measures the extent to which the population is engaged in productive labour market activity)[17]. They found a significant and positive relationship between GDP and employment and proposed useful suggestions for further research on the causal relationship between employment and GDP. Their finding supports the strand of theory suggesting that the positive relationship between GDP and employment is normal and that the jobless growth development is just a temporary deviation because employment will soon pick up. However, the question to be asked is what causes employment to

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[17] it is also known as the proportion of a country's working-age population that are employed

pick up in the long run. Is it still the mechanism of the economy or the government intervention by policies that would increase employment opportunities?

Taking on the challenge of examining the causal relationship between unemployment and economic growth, Hussain et al. (2010) used the Vector Autoregression (VAR) model to estimate the effects of growth on unemployment. They concluded that cointegration exists between variables growth, unemployment, labour capital, trade openness and human capital. Long run causality was also detected with the use of the VECM (vector error correction model). Again, the authors have used time series analysis for a single country. Intuitively, increased growth in an economy is assumed to drive down the unemployment level. This is not always the case for developing economies[18], especially in Africa. Some economies like China, India and South Africa have good and sustainable economic growth but with high unemployment levels. Economic growth in their economies has not been able to generate more jobs. However, Botswana, which is one of the fastest growing nations in Africa, has been able to reduce its unemployment levels. The general objective of this paper is to analyse the effect of growth in the economy on unemployment in SSA countries. Most SSA countries have being able to achieve sustainable economic growth in the past decade.

This chapter examines 40 countries in SSA using the panel data technique and attempts to show the significant effect between economic growth and unemployment. The advantages of panel data over time series is that panel data addresses the research questions based on variations over time and across countries, allowing for heterogeneity across countries. This study also extends the knowledge of employment and economic

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[18] For some developed countries also, high unemployment coexists with good economic growth. The United Kingdom is experiencing a high unemployment level despite it being a developed nation.

growth by looking at the interplay of growth and unemployment. To this end, this chapter addresses the empirical question of whether economic growth can reduce unemployment in African countries. The differences in results are also exploited by grouping countries into oil producing and non-oil producing countries.

The major research questions are:

- Does economic growth have any effect on the unemployment level in these countries

- Is sustainable growth necessary to reduce unemployment?

The first question requires that economic growth be statistically significant in the unemployment equation; this enables the researcher to make the conclusion that economic growth does have an impact on unemployment in the countries in the sample. The second question is whether increased growth is a necessity for a reduction in unemployment levels. It is expected that the results should be significant; so increased growth should reduce unemployment levels.

2.3 Methodology and Data

The research methods of this chapter include the formulation of an empirical real growth model based on economic theory and previous evidence. Economic growth is determined by physical capital, human capital and technological change stimulated by R&D. This section includes other variables of interest in the Solow (1956) neoclassical growth model by incorporating human capital and unemployment as the dependent variable. Human capital has been added to the model because developing human skills either by education or learning on the job can increase growth in output per worker which further causes an increase in overall economic growth, which should in return

cause a reduction in the unemployment level. Similar extension of the Solow growth model has also been developed by Lucas (1988), Schultz (1997), Teal and Soderbom (2003), Oketch (2006), Fuente (2007) and Haldar et al (2010).

Sustained economic growth is said to reduce high unemployment according to most theoretical models of endogenous growth[19] Following Oketch (2006) and Haldar et al (2010), I considered an implicit production function such as:

$$Y_t = Y(K_t H_t N_t \mu) \tag{27}$$

Where, Y is aggregate output, K is the stock of physical capital, H is the stock of human capital, N is labour employed in the country and t = time. μ is external factors or shocks that might affect growth like exports, imports or oil prices. Physical capital is expected to increase growth in the economy. A country that increases its stock of physical capital will also increase its technological base and machinery and inevitably increase growth in the economy. Also, stock of human capital can be used in the production of more goods and services or in R&D which can in turn lead to growth or production of more human capital. The number of people who enter into the labour force and are gainfully employed should also increase the stock of human capital via learning on the job and training. Differentiating equation (1) with respect to time t

$$\frac{\delta Y}{\delta t} = \frac{\delta Y}{\delta K}\frac{\delta K}{\delta t} + \frac{\delta Y}{\delta H}\frac{\delta H}{\delta t} + \frac{\delta Y}{\delta N}\frac{\delta N}{\delta t} + \frac{\delta Y}{\delta \mu}\frac{\delta \mu}{\delta t} \tag{28}$$

and diving through by Y[20] the equation below is arrived at:

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[19] Theoretical model of endogenous growth explains that labour market reforms that reduce unemployment would lead to higher growth. Labour productivity increases over time not only because a larger amount of physical capital per employee becomes available, but also because the stock of knowledge and skills embodied in each employee grows over time. It argues that, the accumulation of human rather than physical capital is the fundamental source of growth in modern economies. See Storesletten and Zilibotti (2000) for more details

[20] Dividing through by Y converts the growth on the left hand side to a percentage rate of change overtime.

$$\frac{1}{Y}\left(\frac{\delta Y}{\delta t}\right) = \frac{1}{Y}\left(\frac{\delta Y}{\delta K}\right)\left(\frac{\delta K}{\delta t}\right) + \frac{1}{Y}\left(\frac{\delta Y}{\delta N}\right)\left(\frac{\delta N}{\delta t}\right) + \frac{1}{Y}\left(\frac{\delta Y}{\delta H}\right)\left(\frac{\delta H}{\delta t}\right) + \frac{1}{Y}\left(\frac{\delta Y}{\delta \mu}\right)\left(\frac{\delta \mu}{\delta t}\right)$$
(29)

The partial derivatives of each type of capital with respect to time, that is, $\frac{\delta K}{\delta t}$ and $\frac{\delta H}{\delta t}$ represent the services yielded by increase to total capital stock in achieving increase in output after they are multiplied by their corresponding marginal productivities. Marginal productivities are the partial derivatives of output with respect to the input. Equation 3 has been further simplified to give:

$$y = MPP_k \cdot \frac{I_k}{Y} + MPP_N \cdot n\frac{N}{Y} + MPP_H \cdot \frac{I_H}{Y} + \alpha_1 \frac{\delta \mu}{\delta t}$$
(30)

The growth in y can be explained by input made by the rate of investment in physical and human capital which is weighted by their respective marginal productivity from equation (4) and also by employment growth of labour weighted by its marginal product.

I_K/Y is comprised of gross domestic investment in physical capital (annual % of GDP) and domestic credit to private companies (annual % of GDP). Domestic Credit has been included in the model because it is expected that if companies are given grants and easy access to credit it would increase production, thereby causing an increase in the number of people unemployed.

I_H/Y consists of education, which is represented by literacy rate and tertiary enrolment. Literacy rate and tertiary enrolment have been used interchangeably to examine any difference in results and also because of lack of robust data for the variable literacy rate in most of the sample countries. $MPP_N \cdot n\frac{N}{Y}$ denotes unemployment level and μ is exports of goods and services as a percentage of GDP. An open economy considers

exports as a variable that augments output and it is determined endogenously through labour productivity. Also, in line with this argument, Romer (1990) developed an "endogenous technical change" through research and development as an externality enabling the communication of knowledge inputs and facilitating designs. Wood (1994) suggested that skill development through education is a key determinant of comparative advantage export performance. Therefore, export induced growth is basically driven by endogenous growth. In Sub-Saharan Africa, the goods exported are mainly Gold, Timber, Rubber, Textiles and Apparel, Leather, Oil, Coal, Iron and Steel. The ratio of exports in our sample countries differs considerably, as some countries are import oriented while others are exports oriented.

Another reason why there is much disparity is because the oil exporting countries prefer to trade with countries outside of Africa. In our data Seychelles has the highest export rate and this is due to the Fishing and Tourism industries in the country. These two industries are extremely developed and the fishing industry alone contributes about 80% of GDP; the main fish product being canned tuna. The lowest export rate was from Equatorial Guinea in 1992. However, exports increased in subsequent years as a result of oil production Equatorial Guinea is the third largest country in Sub-Saharan Africa to export oil after Nigeria and Angola.

The large difference in the range of goods and services exported amongst the Sub-Saharan countries would affect the rate at which the economy grows and unemployment in terms of if high exports encourage job creation. The extent to which exports affect unemployment can also be determined but might be slightly biased due to the large disparity in export figures. More reliable estimates would be to test each country's

export against unemployment. It is possible to group these countries into small exporting countries and large exporting countries to find out these effects, but for simplicity all the countries have been grouped together to show if exports have an effect on reducing unemployment in the selected countries in Sub-Saharan Africa.

Simplifying equation (30) further, we have:

$$y^* = I_K^* + I_H^* + L + \mu \tag{31}$$

I_K^* represents the reduced form of $MPP_k . \dfrac{I_k}{Y}$, same goes for I_H^*, $MPP_N . n \dfrac{N}{Y}$ is reduced as L.

Output, and human capital are treated as endogenous. Rearranging the terms, the following function forms the basis of the estimation:

$$L_{it} = y_{it} - I_K - I_H - \mu \tag{32}$$

$$L_{it} = a_{1it} + a_{2i}GGDP_{it} + a_{4i}GGDI_{it} + a_{5i}DC + a_{6i}HC - a_{3i}EXP_{it} + \varepsilon_{it} \tag{33}$$

$$L_{it} = a_{1it} + a_{2i}GGDP_{it} + a_{4i}GGDI_{it} + a_{5i}DC + a_{6i}HC - a_{3i}EXP_{it} + a_{7i}OPEN_{it} + \varepsilon_{it} \tag{34}$$

a's are coefficients to be estimated. GGDP is growth rate of GDP, GGDI is the growth rate of Gross domestic Investment, DC is domestic credit while HC is human capital[21]. EXP is export as a percentage of GDP added to the model to show its effects on unemployment.

Additional Variable: An extension of the model includes trade openness which is the ratio of exports and imports to GDP. Trade openness is the degree to which a country trades with other countries or economies. The trading activities include import and export, borrowing and lending and foreign direct investment (FDI). The endogenous

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[21] Human capital is represented as Literacyrate and tertiary enrolment. Literacyrate is used only in the first Model as there are fewer observation and it is assumed that tertiary enrolment is a more efficient proxy for human capital

growth literature has provided a wide range of models in which trade restrictions can either decrease or increase growth[22]. Trade openness has been added to this analysis because of its very complex and ambiguous relationship with growth. A wide range of empirical studies have concluded that open economies have higher growth rates than inward-oriented countries. This research therefore assumes that a country open to trade will also increase employment either in the services industry or in the manufacturing industry, thereby reducing unemployment. This assumption is tested in the analysis. Two panel data methods to be used to estimate equations (33) and (34) are fixed effects and two-step GMM. Hausman test based on the difference between fixed and random effects estimators was conducted and the result reveals fixed effects are a better estimator at the 10 per cent interval.

Using annual data for estimation purposes requires that an allowance is made for the possibility that observations may not represent long run values because of slow adjustment to changes in variables. To account for these effects, the generalized method of moments condition (GMM) developed by Arrelano and Bond (1991) for panel data estimations is used. The Arrelano Bond technique is specifically designed to address the econometric problems induced by unobserved group-specific effects and endogeneity of the explanatory variables in lagged dependent variable models such as growth regression (Hasan et al. 2009). The GMM estimator differences the model to get rid of country specific effects or any time invariant country specific variable. It also eliminates the endogeneity that may be due to correlation of these country specific effects and the right hand side regressors. This helps to ensure that all regressors are

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[22] See Grossman and Helpman (1990), Romer (1990) and Matsuyama (1992) for detailed explanation

stationary. Descriptive statistics are shown in Table A.2, and Table A.3 in the Appendix presents the correlation matrix of the variables.

Other equations estimated along with the baseline equation above are:

$$Unemp_{it} = \beta_1 + \beta_2 ggdp_{it} + \beta_3 ggdi_{it} + \beta_4 domcredit_{it} + \beta_5 \exp_{it} \tag{35}$$

$$Unemp_{it} = \eta_1 + \eta_2 ggdp_{it} + \eta_3 ggdi_{it} + \eta_4 domcredit_{it} + \eta_5 \exp_{it} + \eta_6 tetenr_{it} + oild \tag{36}$$

$$Unemp_{it} = a_1 + a_2 ggdp_{it} + a_3 ggdi_{it} + a_4 domcredit_{it} + a_5 \exp_{it} + a_6 tetenr_{it} + noild \tag{37}$$

$$Unemp_{it} = e_1 + e_2 ggdp_{it} + e_3 ggdi_{it} + e_4 domcredit_{it} + e_5 \exp_{it} + oild \tag{38}$$

$$Unemp_{it} = \alpha_1 + \alpha_2 ggdp_{it} + \alpha_3 ggdi_{it} + \alpha_4 domcredit_{it} + \alpha_5 \exp_{it} + noild \tag{39}$$

Oild represents oil dummy for oil producing countries[23] and *noild* is dummy variable for non-oil producing countries

2.3.1 Data Sources

As mentioned earlier this chapter attempts to establish the empirical relationship between unemployment and economic growth in SSA. It employs annual data from 1982 to 2007 for all variables used for 40 countries in Sub-Saharan Africa[24]. All variables are in annual growth as a percentage of GDP, except for human capital and unemployment which are in rates. Annual percentage growth is used because the primary interest is in the relationship between the variables over time in a particular country. Thus, the question is if an increase in growth will lead to a decrease in unemployment controlling for time-invariant country-specific characteristics. Modelling unemployment as a function of the growth of GDP provides a more rigorous

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[23] Oil producing countries in our sample include: Cameroon, Chad, Cote d'Ivoire, Congo Republic, Equatorial Guinea, Ethiopia, Gabon, Ghana, Mauritania, Nigeria and South Africa.
[24] The 40 countries in our sample were chosen because they have data on variables to be analysed.

method of assuring that the results from a panel of countries applies as much as possible to individual countries.

Another advantage of using growth rates of the explanatory variables is that the variables are much more likely to be stationary. Human capital will be measured by level of tertiary school enrolment also used by Barro 1991 and Barro and Lee (1993) and Literacy rate. Tertiary enrolment is assumed to be a more superior measure of skilled human capital as it entails people who have studied up until the university level. The argument is one can be literate and not be educated. Literacy is the ability to read and write, being skilled ensures a significant level of education and training. Tertiary enrolment is therefore used as the more appropriate measure of human capital and it also has more observations than literacy rate. The variable literacy rate for most African countries has little or no data for the years across the sample. Lagged variables of both dependent and independent variables will be added to the model; this is to take into account the dynamic process of growth; and the lagged dependent variables takes into account variables that might have been omitted. Data was sourced from World Bank development indicators and the Africa Development Indicator.

2.4. Estimation Results

This section analyses the results of estimating equation (33 to 39) on 40 countries over 26 years using fixed effects and dynamic GMM estimation. The estimation results are presented in Tables 2.1 to 2.6. The list of countries is shown in Table A.1; Table A.2 presents the Summary Statistics, while Table A.3 shows the Correlation matrix in the Appendix section. These tables gives a general view of the relationship between economic growth represented as annual percentage growth of GDP, unemployment,

Gross Domestic Investment (GGDI), Export and Domestic credit in SSA. GGDI, Export and Domestic credit have a positive but not very strong correlation with unemployment. However, literacyrate a measure of human capital has a 60% correlation with unemployment. GGDP has a negative correlation with unemployment. The highest correlation in the matrix is between literacy rate and unemployment.

2.4.1 Fixed Effects Estimation

Table 2.1 below presents the results from estimation of the equations (33-39) above excluding equation 34. The first Model in the result table reports the baseline regression that is equation (33) which includes all variables of interest with literacy rate as human capital proxy. In the second Model, tertiary enrolment replaces literacy rate as proxy for human capital[25]. In Model 3, human capital proxy is removed to see the effect it will have on GDP and unemployment. Model 4 presents all variables with tertiary enrolment as proxy for human capital for oil producing countries, while model 5 shows the result for non-oil producing countries. Models (6) and (7) reports the regression results of oil producing and non-oil producing countries respectively with no human capital variable.

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[25] Literacy rate is replaced with tertiary enrolment as the number of observations is extremely low and tertiary enrolment is believed to be a better estimate for human capital.

Table 2. 1– Unemployment and Economic Growth in SSA (1982-2007) - *Panel Data Estimation Using Fixed Effects (FE)*

VARIABLES	1	2	3	4	5	6	7
GGDP	-0.291	-0.104**	-0.085***	-0.074***	-0.136**	-0.080***	-0.081***
	(0.213)	(0.0425)	(0.0171)	(0.0118)	(0.0628)	(0.0152)	(0.0242)
GGDI	0.237	-0.0473	-0.052***	0.0154	-0.0687	-0.00402	-0.122***
	(0.231)	(0.0323)	(0.0154)	(0.0103)	(0.0438)	(0.0108)	(0.0296)
CREDIT	0.237	0.0722**	0.0229	0.0324***	0.1000**	0.0455***	0.00925
	(0.152)	(0.0335)	(0.0195)	(0.0101)	(0.0465)	(0.0167)	(0.0285)
EXP	-0.0266	0.0626**	0.0598***	0.0251***	0.0920**	0.0241***	0.116***
	(0.170)	(0.0244)	(0.0127)	(0.00602)	(0.0397)	(0.00894)	(0.0254)
LITRATE	0.119						
	(0.156)						
TENR		-0.103		0.106	-0.148		
		(0.0994)		(0.0702)	(0.121)		
Constant	-2.461	10.08***	10.29***	7.204***	10.21***	9.360***	10.60***
	(7.071)	(1.315)	(0.631)	(0.429)	(1.972)	(0.578)	(1.137)
No of Observations	47	209	562	48	161	155	407
R-squared	0.718	0.099	0.097	0.632	0.119	0.212	0.139

***, ** and * indicate statistical significance at 1%, 5% and 10% respectively

Panel Data estimation using fixed effects (FE)

Table 2. 2- Unemployment and Economic Growth in SSA (1982-2007) - *Panel Data Estimation Using Fixed Effects (FE) Robust Standard Errors*

VARIABLES	1	2	3	4	5	6	7
GGDP	-0.291***	-0.104***	-0.085***	-0.074***	-0.136***	-0.080***	-0.081***
	(0.101)	(0.0269)	(0.0177)	(0.0111)	(0.0484)	(0.00783)	(0.0240)
GGDI	0.237	-0.0473	-0.0517	0.0154**	-0.0687	-0.00402	-0.122
	(0.188)	(0.0677)	(0.0508)	(0.00597)	(0.0873)	(0.00402)	(0.107)
CREDIT	0.237*	0.0722	0.0229	0.0324**	0.1000	0.0455**	0.00925
	(0.132)	(0.0740)	(0.0395)	(0.0126)	(0.109)	(0.0194)	(0.0714)
EXP	-0.0266	0.0626**	0.0598	0.0251**	0.0920**	0.0241*	0.116*
	(0.137)	(0.0286)	(0.0393)	(0.0109)	(0.0418)	(0.0126)	(0.0612)
LITRATE	0.119						
	(0.167)						
TENR		-0.103		0.106	-0.148		
		(0.111)		(0.0977)	(0.135)		
Constant	-2.461	10.08***	10.29***	7.204***	10.21***	9.360***	10.60***
	(5.354)	(2.140)	(0.990)	(0.839)	(3.130)	(0.854)	(2.031)
No of Observations	47	209	562	48	161	155	407
R-squared	0.718	0.099	0.097	0.632	0.119	0.212	0.139

***, ** and * indicate statistical significance at 1%, 5% and 10% respectively
Robust standard errors are in parentheses
Panel Data estimation using fixed effects (FE)

Largely, the results presented are consistent with earlier expectations. GGDP is statistically significant, having a negative effect on unemployment in all equations except for the base line equation where there is no significant effect; this is assumed to be as a result of very few observations in the overall regression caused by literacy rate. From Model 2, tertiary enrolment – the second proxy for human capital - reduces unemployment but with no statistical significance. It is assumed that, as more people are educated, skilled labour develops which in turn increases productivity and then growth. Mischel (2011) stated that education might not be the answer to solving unemployment problems if unemployment is a cyclical and not a structural issue. He stated that if unemployment is cyclical, eventually those unemployed would find work at some point by relying on the skills they have acquired. The effect this has is that there might be a 'brain drain', resulting in skilled workers migrating from their countries to developed countries where they are better paid and have better salary packages. This is a major issue for most Sub-Saharan economies; the highly educated workers, like doctors and lawyers are leaving the country for jobs outside Africa.

The coefficients for literacy rate might be biased due to lack of adequate data for SSA countries. Another regression with growth (GGDP) as the dependent variable was estimated, and it was found that literacy rate does have a significant effect on growth. This in essence could be, if human capital increases growth, this increased growth can lead to lower levels of unemployment. In other words, human capital does affect unemployment indirectly. This supports similar findings of Fuente (2007) and Storesletten et al. (2000) that investing in human capital through education greatly increases growth, thereby reducing unemployment levels. Dropping both literacy rate

and tertiary enrolment increases the number of observation in the estimation as can be seen in model 3 of Table 2.1 and 2.2.

Gross domestic investment appears statistically significant in the overall equation without human capital. The result also shows that Investment in oil producing countries does not statistically affect unemployment rates whereas its effect becomes significant for non-oil producing countries without the human capital variable present in the regression. Another set of regression was carried out which excluded exports and human capital (results not shown) and GGDI became statically significant for both oil and non-oil producing countries; it might be safe to say that GGDI plays an important role in reducing unemployment.

Turning to coefficients for domestic credit, in all Models there is a positive sign and significant effect. Domestic credit is the amount of credit the private sector (firms) gets to finance investment to set up businesses. The results obtained are similar to findings by Evans and Leighton (1990), who found unemployment to be positively associated with a greater propensity to start a new firm. However, Audretsch et al (2001) showed that entrepreneurship can be positively and negatively related to unemployment levels. Their results show there is a positive and negative significant effect. The positive effect is known as "the refuge effect" while the negative effect is the "Schumpeter effect". If the private sector has easier access to credit, this can increase the entrepreneurship level in a country thereby reducing unemployment. In the results above, however, a positive relationship is found. The positive relationship obtained could be due to firms laying off employees and replacing them with physical capital. A private firm that has previously hired, say, about 30 people on getting credit from the government might want to

increase its technology and capital based production, which could result in some of the work force losing their jobs. If this happens in more than 50% of the firms there will be an overall increase in unemployment and this might be the reason why there is a positive relationship. This is a case of increases in technology causing increase in unemployment due to capitalisation.   Exports also enter with a positive significant effect in all models except for the baseline equation, which has a negative but insignificant effect. Increase in exports should spur increase in output, which should generate more jobs in the economy. This is the theoretical view. However, African economies do not necessarily exhibit the same results when theoretical views are tested empirically.

The positive effect of exports on unemployment could be because, as firms increase production, physical capital increases instead of human capital, either due to cost or time efficiency. However, exports have a high positive significant effect on GDP. In ranking the models, Model 3 from the results table seems to be most appropriate for all aggregated countries. For oil producing countries, Model six is a slightly better result than Model four. For non-oil producing countries, Model seven performs better than Model five. It is interesting to note that the models that have performed slightly better do not have human capital variable in them. This could be due to the poor data on human capital in this region or because human capital has not been properly invested in to cause a significant change in unemployment.

The result from the robust estimation in Table 2.2 does not show any significant difference either in size or sign from earlier reported results, except for reporting the robust standard errors. This confirms the appropriateness of the estimation technique and that the model has been specified accurately.

Table 2. 3– Unemployment and Economic Growth in SSA (1982-2007) - *Panel Data Estimation Using Fixed Effects (FE) with Trade Openness*

VARIABLES	1	2	3	4	5	6	7
GGDP	-0.153	-0.106***	-0.085***	-0.074***	-0.139**	-0.083***	-0.096***
	(0.0916)	(0.0407)	(0.0170)	(0.0114)	(0.0590)	(0.0155)	(0.0233)
GGDI	0.412***	-0.00353	-0.0217	0.00784	-0.0131	-0.0155	-0.0571*
	(0.101)	(0.0327)	(0.0185)	(0.0108)	(0.0431)	(0.0155)	(0.0304)
CREDIT	0.186**	0.0528	0.0229	0.0303***	0.0532	0.044***	0.00036
	(0.0639)	(0.0324)	(0.0194)	(0.0099)	(0.0450)	(0.0168)	(0.0274)
EXP	0.152*	0.159***	0.102***	0.00814	0.216***	0.0120	0.262***
	(0.0770)	(0.0332)	(0.0195)	(0.0110)	(0.0470)	(0.0148)	(0.0348)
LITRATE	-0.0346						
	(0.0700)						
TENR		-0.0915		0.0991	-0.105		
		(0.0952)		(0.0680)	(0.114)		
OPEN	-0.230***	-0.073***	-0.032***	0.0124*	-0.097***	0.0106	-0.095***
	(0.0391)	(0.0178)	(0.0112)	(0.00683)	(0.0224)	(0.0103)	(0.0162)
Constant	13.13**	12.00***	10.70***	7.096***	13.42***	9.303***	12.13***
	(3.964)	(1.343)	(0.642)	(0.419)	(1.996)	(0.580)	(1.121)
No of Observations	47	209	562	48	161	155	407
R-squared	0.958	0.180	0.111	0.666	0.229	0.218	0.210

***, ** and * indicate statistical significance at 1%, 5% and 10% respectively
Panel Data estimation using fixed effects (FE)

Table 2. 4 – Unemployment and Economic Growth in SSA (1982-2007) - *Panel Data Estimation Using Fixed Effects (FE) with (Trade Openness)*

VARIABLES	1	2	3	4	5	6	7
GGDP	-0.153***	-0.106***	-0.085***	-0.074***	-0.139**	-0.083***	-0.096***
	(0.0516)	(0.0323)	(0.0175)	(0.00972)	(0.0549)	(0.00979)	(0.0341)
GGDI	0.412***	-0.00353	-0.0217	0.00784	-0.0131	-0.0155	-0.0571
	(0.0455)	(0.0471)	(0.0425)	(0.00515)	(0.0608)	(0.0137)	(0.0803)
CREDIT	0.186***	0.0528	0.0229	0.0303**	0.0532	0.0440**	0.000363
	(0.0474)	(0.0547)	(0.0366)	(0.0122)	(0.0745)	(0.0182)	(0.0528)
EXP	0.152***	0.159*	0.102	0.00814	0.216*	0.0120**	0.262*
	(0.0325)	(0.0881)	(0.0785)	(0.00819)	(0.111)	(0.00473)	(0.136)
LITRATE	-0.0346						
	(0.0478)						
TENR		-0.0915		0.0991	-0.105		
		(0.0850)		(0.106)	(0.0793)		
OPEN	-0.230***	-0.0727	-0.0322	0.0124**	-0.0965	0.0106	-0.0947
	(0.0241)	(0.0530)	(0.0341)	(0.00511)	(0.0676)	(0.00934)	(0.0654)
Constant	13.13***	12.00***	10.70***	7.096***	13.42***	9.303***	12.13***
	(2.055)	(2.079)	(0.840)	(0.892)	(2.892)	(0.885)	(1.871)
No of Observations	47	209	562	48	161	155	407
R-squared	0.958	0.180	0.111	0.666	0.229	0.218	0.210

***, ** and * indicate statistical significance at 1%, 5% and 10% respectively

Robust standard errors are in parentheses

Panel Data estimation using fixed effects (FE)

Turning to the estimation results with trade openness, the results are reported in Tables 2.3 and 2.4 above. Trade openness in any country should boost economic growth according to existing growth literature[26]. When this happens the growth can be channelled to reducing unemployment. However, the relationship that exists between these two variables is still unclear as some researchers find a negative significant effect. Trade openness is measured as the ratio of export and import to GDP. The variable shows a negative and significant effect in the Models 1 to 3 for all sample countries. Interestingly, trade openness has a positive sign for oil producing countries and is significant with the presence of human capital. This could be as a direct result of the oil production and export, therefore limiting the impact of trade openness, or that the policies in these countries do not favour trade liberalization. It can be assumed that for these countries trade openness does not reduce unemployment. This could be as a result of various reasons, some mentioned earlier, which have not been explored empirically as a result of time limitations.

Literacy rate enters with a negative sign in the base line equation with trade openness but is still not significant. Exports still remain positive and significant in all models, except for oil producing countries where the coefficients remain positive but insignificant. GGDP remains statistically significant with a negative relationship to unemployment with a slight difference in size of the coefficients. With the presence of trade openness, gross domestic investment (GGDI) also does not change very much. Domestic credit to private sector increases unemployment in the base line model and in oil producing countries.

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[26] See for example Harrison (1996), Clemens and Williamson (2001) and Irwin (2002)

2.4.2 GMM Estimation of Unemployment and Economic Growth

The dynamic GMM estimation of unemployment, economic growth and the other explanatory variables, GGDI, domestic credit, exports and tertiary enrolment is reported in Table 2.5 below. The results are not that far off from the fixed effects estimation method. Some, however, show a negative impact. Tertiary enrolment enters with a significant negative relationship. For non-oil countries, human capital development should be increased, as it is seen to reduce unemployment. Export still retains the positive relationship in all countries. Domestic Credit is shown not to predict unemployment except in oil producing countries. GGDP is negatively related to unemployment for all models. Again, the results obtained support the hypothesis that increased economic growth reduces unemployment. Countries in Sub-Saharan Africa should therefore encourage growth in the major sectors of the economy in order to generate more jobs and reduce the unemployment with which the region is plagued. All models satisfy all diagnostic tests. The absence of second order correlation is not rejected in all models. The lagged dependent variable is positive and significant and the Hansen test is also passed for all estimations. The GMM estimator is therefore appropriate and can be relied upon.

Turning attention to the GMM estimation with trade openness in Table 2.6 below, trade openness has a positive effect on unemployment in the estimations with all sample countries. Both oil and non-oil producing countries have growth reducing unemployment with the inclusion of trade openness. The values are very small but significant. The lagged dependent variable is statistically significant and positive. The effect of all other variables is not too different using the GMM estimator.

In summary, the findings in this chapter suggest that economic growth does indeed reduce unemployment in both estimations. The result for Gross Domestic Investment in oil producing countries should be interpreted with caution, as the variable is seen to increase unemployment. The number of observations for Model 4 is very small and can be said not to be robust, since a large number of observations is needed for reliable predictability when using dynamic panel methods. Domestic credit, exports and human capital all affect unemployment in different ways and for oil and non-oil producing countries. Although, these variables increase economic growth, their effects could be combined to cause further increase in growth; the effect of this growth on unemployment perhaps might be larger than what is reported in this chapter.

Table 2. 5-GMM Estimation

				Oil Producing		Non-Oil	
Producing							
VARIABLES	1	2	3	4	5	6	7
L.UNEMP	0.857***	0.563***	0.778***	0.750***	0.658***	0.835***	0.771***
	(0.0323)	(0.110)	(0.0722)	(0.0792)	(0.0862)	(0.0380)	(0.0705)
GGDP	-0.084***	-0.120***	-0.090***	-0.062***	-0.080***	-0.094***	-0.078***
	(0.0146)	(0.0138)	(0.0228)	(0.00667)	(0.0111)	(0.0171)	(0.0158)
GGDI	0.0227	-0.00967	0.0616*	0.0107**	-0.00254	0.0483	0.0505
	(0.0233)	(0.00783)	(0.0343)	(0.00489)	(0.00722)	(0.0356)	(0.0407)
CREDIT	0.0152	0.0478	0.0306	0.0357***	0.0260***	-0.00517	0.0432
	(0.0101)	(0.0391)	(0.0198)	(0.00845)	(0.00656)	(0.0155)	(0.0269)
TENR	-0.0347*		-0.0603**	0.0692		-0.0416**	
	(0.0210)		(0.0237)	(0.0719)		(0.0210)	
EXP	0.0239**	0.0293*		0.0209***	0.0219**	0.0358***	0.0424**
	(0.0100)	(0.0159)		(0.00784)	(0.0111)	(0.0118)	(0.0198)
Constant	0.613		1.254	0.729	2.528**	0.536	0.0137
	(0.374)		(0.799)	(0.625)	(1.022)	(0.487)	(0.734)
AR (1) P-value	0.021	0.065	0.23	0.867	0.103	0.072	0.049
AR (2) P-value	0.788	0.232	0.861	0.387	0.264	0.363	0.273
Hansen Test (P-value)	0.751	0.193	0.192	0.417	0.654	0.552	0.441
No of Observations	186	489	186	42	146	144	383

***, ** and * indicate statistical significance at 1%, 5% and 10% respectively
Standard errors and p-values are in parentheses
Panel Data estimation using GMM (Arellano-Bond Estimator)

Table 2. 6- GMM Estimation with *Trade Openness*

VARIABLES	1	2	3	Oil Producing 4	5	Non-Oil 6	7
L.UNEMP	0.477***	0.566***	0.770***	0.762***	0.655***	0.895***	0.831***
	(0.0491)	(0.110)	(0.0352)	(0.107)	(0.0778)	(0.0273)	(0.0900)
GGDP	-0.063***	-0.119***	-0.080***	-0.062***	-0.077***	-0.082***	-0.101**
	(0.00948)	(0.0138)	(0.0135)	(0.00692)	(0.00868)	(0.0142)	(0.0417)
GGDI	-0.0119	-0.00833	-0.0489	0.0112**	0.00360	0.0146	-0.0115
	(0.00912)	(0.00923)	(0.0458)	(0.00535)	(0.0113)	(0.0127)	(0.0480)
CREDIT	0.0286*	0.0490	0.0138	0.0342***	0.0472***	0.00123	0.00752
	(0.0160)	(0.0395)	(0.0128)	(0.0115)	(0.0114)	(0.0138)	(0.0261)
TENR	-0.0404		-0.0479*	0.0605		-0.0234*	
	(0.0361)		(0.0251)	(0.0837)		(0.0128)	
EXP	-0.0161	0.0349		0.0229*	0.0304*	0.0243*	0.00701
	(0.0120)	(0.0214)		(0.0119)	(0.0158)	(0.0135)	(0.0407)
OPEN	0.0116*	-0.00324	0.0300***	-0.00162	-0.00401	-0.00241	0.0171
	(0.00604)	(0.00814)	(0.0104)	(0.00739)	(0.00985)	(0.00745)	(0.0347)
Constant			1.719**	0.724	2.036***	0.731**	0.786
			(0.721)	(0.641)	(0.639)	(0.364)	(0.620)
AR (1) P-value	0.018	0.066	0.022	0.804	0.112	0.011	0.068
AR (2) P-value	0.338	0.235	0.991	0.504	0.256	0.848	0.264
Hansen Test (P-value)	0.654	0.16	0.844	0.421	0.542	0.476	0.272
No of Observations	140	489	186	42	146	144	383

Producing

***, ** and * indicate statistical significance at 1%, 5% and 10% respectively

Standard errors and p-values are in parentheses

Panel Data estimation using GMM (Arellano-Bond Estimator)

2.5 Conclusion

It has been suggested that the high unemployment experienced in most developing countries is a result of lack of economic growth. The increase in economic growth in most African countries in recent years has resulted in this study conducting an empirical exploration of whether there has been a reduction in unemployment. It has been found that continuous growth in the economy will result in reduction of the unemployment rate. That is, an inverse relationship exists between these two variables. Findings also suggest that Sub-Saharan countries can benefit from opening up their trade to boost employment opportunities. This finding should be taken with caution, as trade openness becomes statistically insignificant in the GMM estimation. Results also show that for non-oil producing countries there is a greater effect of economic growth reducing unemployment; these countries should therefore come up with economic policies that will create more jobs.

Also interesting in the result is the finding that gross domestic investment is significant in reducing unemployment in non-oil producing countries. This study finds that human capital accumulation can significantly reduce unemployment in SSA countries but its effect is much greater if combined with sustainable growth. As a whole, the panel study of 40 African countries over 26 years also suggests that increased growth can reduce unemployment. Unemployment needs to be tackled through growth, sound employment strategies, and appropriate macroeconomic policies. Also, labour intensive policies must be adopted to reduce unemployment in both urban and rural areas. There is also the need to further promote growth in African countries through sound policies, investment in private sector development, opening up trade, encouraging manufacturing of quality products that can increase exports and reduce the high influx of imported

goods faced by most countries, investing in public infrastructures, and discouraging brain drain.

CHAPTER 3: BANK DEVELOPMENT, ECONOMIC GROWTH AND UNEMPLOYMENT – A CASE STUDY OF SUB-SAHARAN AFRICA

3.1 Introduction

A substantial body of research has tried to explain the relationship between economic growth and growth in the banking industry. Most empirical studies have focused on explanatory variables selected on the basis of their relevance to policy makers or theoretical predictions.[27] While most of these studies focused more on economic growth and determinants and non-determinants of growth, extensive study of the relationship between banks' development and growth is still somewhat limited. Koivu (2002) examined the relationship between the banking sector and economic growth; he concluded that, although there have been numerous empirical studies on the determinants of growth in transition economies, very few concentrate on the relationship between financial markets and economic growth, most especially in Africa.[28] The study, however, has some shortfalls: financial sector reforms and banking sector reforms are assumed to be the same; it uses balanced panel data from 25 transition countries, as variables were not always available or were unavailable for identical periods; and it ignores structural differences in the countries.

Banks play an essential role in the development of an economy, most especially in Africa where alternative sources of finance are limited or non-existent. With banks providing essential finance to firms and private individuals, productive investment opportunities are feasible. Schumpeter (1934) stressed the role of the banking sector as

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[27] See Barro (1991), and Levine and Renelt (1992).
[28] Among the few are Drakos (2002) paper on Banking sector structure on economic growth and Caporale et al.'s (2009) paper on Financial Development and Economic growth: Evidence from Ten EU countries

a financier of productive investments and thus an accelerator of economic growth. Levine (2004) also suggests that the development of a banking system goes hand in hand with economic development. This chapter tries to assess the impact of bank development, the structure and regulations of the industry on economic growth. It examine whether the market structure of the banking sector has any empirical relevance for economic growth.

In Africa, very few studies have been done on the relationship between economic growth and banking sector development. The majority of the empirical work that has been done concentrated on South Africa and North Africa. Ncube (2009) studied the efficiency of the banking sector and economic growth in South Africa. Demetriades and Fielding (2011) also suggested the relationship between institutions and banking sector development in French-speaking West African countries. In English-speaking West African countries, the only empirical paper to the researcher's knowledge is by Balogun (2007), who examined the relationship between banking sector reforms and the Nigerian economy. The paper, however, has come under criticism for its use of certain parameters in its model specification. For example, its use of number of bank branches as a determinant of economic growth is very unreliable.

Also, the paper uses lending rates, saving rates and exchange rates as explanatory variables. However, Fadare (2010) suggested that, rather than using lending rates or savings rates as explanatory variables, net interest rate margin is a better estimator for efficiency in the banking sector, as it describes transaction costs within the sector. As a result of this there is a gap in the economic literature regarding investigation into

whether recent banking sector reforms in the majority of Sub-Saharan economies has led to development of the sector and subsequently increased growth in the economy.

Using a panel data comprised of banks in 46 countries and spanning 1997-2010, this chapter explores the empirical linkage between the banking system and growth of an economy. The relationship is investigated using a regression analysis in which annual growth of GDP is the dependent variable and return on asset, profit before tax and domestic credit to private sector are explanatory variables. The effects of bank concentration and bank regulations on economic growth are also examined. A further analysis was carried out to determine if development in the banking sector has generated more or fewer jobs in the economy.

The research attempts to follow Collender and Shaffer (2009), who examined the empirical relationship between employment growth, banking structure and economic growth in metropolitan areas in the United States of America. Seeing that the US economy is very different from Africa or any other economy, the model and estimation are tailored to how the African economies operate. This research also controls for macroeconomic stability and institutional variables that may affect the structure of the banking industry and economic growth. The findings of this chapter support the theory that a well-developed banking sector together with sound regulatory environment and low corruption can accelerate economic growth and can increase employment in Sub-Saharan African countries. Economic resources need to be channelled appropriately. The chapter contributes significantly to the existing literature by deepening our understanding of the relationship between banking sector development and economic growth in Sub-Saharan Africa. These findings are broadly consistent with Caporale et

al. (2009), who show that credit to the private sector is less likely to have an effect on economic growth as a result of bank crises and non-performing loans. The results are also constituent with Kablan (2010), who found that inflation negatively influences credit issued to the private sector, thereby reducing economic growth. The rest of the chapter is organised as follows: Section 2 presents background about the banking sector in Sub-Saharan Africa; recent theoretical and empirical research work is discussed in Section 3. Section 4 describes the data and methodology. Section 5 summarizes the empirical results while Section 6 provides the conclusion.

3.2. The Banking Sector in Sub-Saharan Africa

The banking system in Africa consists mainly of Central Banks and deposit-taking institutions also known as commercial banks. The Central Banks are technically independent of government control, but in practice they work closely with the Ministries of Finance of their states and help formulate and implement macroeconomic policies of the various governments. The deposit-taking institutions are made up of local banks and branches or subsidiaries of foreign banks[29]. Foreign banks have played an important role in banking development in Africa; their share of total African banking has increased significantly, as shown in Table B.2 in the Appendix. This increase can be attributed to the financial sector reforms that SSA countries have embarked upon, which in turn have led to the opening up of the markets in Africa and the entry of foreign banks.

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[29] Foreign banks are banks within and outside the continent. Some Nigerian-owned banks have branches in other countries; these banks are considered foreign even though they are owned by another African country.

Most banks in SSA are either dominated by state-owned banks or by a few large, sometimes foreign banks. Another common feature of the banking system in Africa is that a large number of banks invest in government securities, mainly treasury bills. This can be detrimental to the growth of the industry since it is reflective of a highly dysfunctional banking intermediation that ignores provision of private credit in favour of safer government securities. The sector is however, undergoing reforms focusing on restructuring state-owned banks with a view of improving the quality of services and property rights. The initial development experienced as a result of the reforms still cannot be compared to other regions in the world. Having said that, countries like Nigeria and the Southern African countries of Malawi, Botswana and South Africa can boast of a sound banking system with well capitalised, dynamic and innovative banking practices. Seychelles also has a highly sophisticated banking system, which is similar to that found in most developed countries (Allen et al. 2011). The next section briefly gives background information on the banking industry of each region.

3.2.1 West Africa Banking Industry

The West African region is made up of two distinct linguistic zones, the French-speaking and English-speaking. The French-speaking countries are comprises of Niger, Benin, Cote d' Ivoire, Mali, Senegal, Togo, Burkina Faso, Chad and Gabon. These countries have a common central bank, namely the Central Bank of West African States (BCEAO), which is located in Dakar, Senegal. The Central Bank is the only entity authorized to issue currency throughout the WAEMU[30] member States. This region has

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[30] West African Economic and Monetary Union (WAEMU) – the aim of this union is to promote economic integration among the member countries. Member countries are Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal, and Togo.

about 90 credit institutions, 70 banks and 20 financial institutions, with Cote d'Ivoire having the largest number of banks (16) followed by Senegal (10). The WAEMU banking system is concentrated, with 19 large banks holding the major market share of 62.7%; 24 are of medium size and hold 27.6% market share; while the remaining 9.7% market share is held by 27 small banks. The WEAMU allows for banks to operate in other member countries. Banks that have been granted a licence to operate in one of the countries can operate in any of the other countries without further administrative formalities. Cross-border borrowing and lending is therefore enhanced. Also, companies can seek financing in any of the eight countries but most firms tend to stay in their home countries where they typically have a comparative advantage.

English-speaking West Africa-The English-speaking countries in West Africa consist of Sierra Leone, Gambia, Ghana, Liberia and Nigeria. Unlike the French-speaking countries in West Africa, the English-speaking countries do not have a single monetary union. The central bank of each country regulates and supervises the activities of commercial banks and other financial institutions to ensure that there is a sound financial system. However, it should be mentioned that Sierra Leone, Gambia, Ghana, Guinea and Nigeria are part of the West African Monetary Zone (WAMZ), which plans to introduce a common currency, 'the Eco' by 2015. Detailed banking system structures on a few of these countries are given below.

Ghana- As at 2009, the banking sector in Ghana has 25 registered banks[31] and is split into three distinct areas: commercial banks, rural and universal banks, and community banks. The influx of foreign banks - mainly from Nigeria - has also helped Ghana's banking system.   In the past, banking in Ghana was practically non-existent as there were only three major banks: Barclays Bank, Standard Chartered bank and Ghana commercial bank. These three banks had the largest market share and only served the elite people in the society.   The past six to seven years have seen the banking sector become vibrant and buoyant with modern services and technology. The bank branches have increased by 11.3 percent, from 309 in 2002 to 344 in 2004 and to 639 in 2008 (Financial Institution Centre, 2009); this has led to increases in deposits.   The majority of the banks now employ cutting edge technology and well trained staff. The very fierce competition in the banking sector has also increased efficiency in product delivery and services, with many more banks offering Saturday services for busy workers who are unable to access banks during the week. The industry experienced an increase in net interest income by 123% in five years and net profits also increased by 120% approximately over the same period. The accounting ratios return on Equity and Return on Assets both decreased, which is indicative of the competitive nature of the industry. The continuous growth in the industry was driven by credit expansion and growth in the number of banks.

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[31] Source: Africa Financial Institutions (2009)

Nigeria **-** Banks have been active in the economy since the late 1800s when the first bank in Nigeria - the African Banking Corporation - was established. Nigeria is the largest economy in West Africa and has an advanced banking system. Nigerian banks make up five of the top twenty banks in Sub-Saharan Africa[32]. The banking system witnessed rapid development and systemic crisis with the economic reforms in 1986 (Nnanna, 2002). From 26 banks comprising 13 commercial banks and 13 merchant banks in 1986, the number of banks grew rapidly to 120 in 1992 and then declined to 89 in 2002. The banking crisis in the mid to late 1990s saw 32 banks liquidated in 1996 alone (Nnannna, 2002). The 21st century paved the way for substantial growth in the banking sector due to more reforms and restructuring. Employment rose considerably as banks appeared to be the only firms hiring substantially in the country. Every available job was in the banking sector.

In 2004, the Central Bank transformed the banking industry through a recapitalisation programme, which reduced the number of banks from 89 to 24, thereby deepening branch penetration; and growth in the industry's balance sheet increased four-fold over 5 years (2004-2008)[33] . Of these 24 banks, 21 are trading publicly on the stock exchange market. Ownership of banks is widely based, with government ownership not more than 10%. However, there are very few foreign banks operating in Nigeria. As at 2007, the performance of the industry showed significant increase in all financial performance metrics from the previous year. Net interest income and profit before tax rose by 202% and 288% respectively, showing the resulting effects of the banking reforms as consolidated banks were able to make use of their larger balance sheets. The last two to three years have seen banks maintain development in the sector, although it

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[32] Source: African Financial Systems: A review (Allen et al. 2010)
[33] Source is by Wharton University- Africa's Financial Institutions

was rocked with systemic crisis from late 2010 to mid-2011 due to corruption at the management level and fraudulent buying and selling of foreign exchange.

Sierra Leone **-** The banking sector consists of eight commercial banks, four community banks, two discount houses and 51 foreign exchange bureaux all of which are supervised by the central bank. The minimum capital required for licensed institutions has been increased to ensure a safer and more stable financial system[34]. The minimum paid up capital for banks increased from SLL 800million to SLL 15billion on a gradual basis. The banking industry in Sierra Leone is not as developed compared to Ghana and Nigeria, but the government has opened up the market for foreign banks to enter. Out of the eight commercial banks in Sierra Leone, six of them are foreign banks owned by Nigerians. The sector has also suffered due to the crisis the nation has faced in terms of economic growth. It is believed that as the economy slowly emerges from civil war and shows signs of a successful transition, investors' confidence will rise and growth will be inevitable.

Gambia **-** Gambia's financial system is dominated by commercial banking. There are currently 10 commercial banks, and almost all of them are mainly owned by foreign financial institutions. The largest commercial bank is a locally incorporated subsidiary of the UK-based Standard Chartered Bank and is 25% Gambian-owned. Gambia's commercial banks offer a variety of banking services, including trade finance and credit, dealings in foreign exchange, equity participation and deposits. The Banking Office is responsible for providing banking services to the government and commercial banks. It is also responsible for managing the payment and settlement system for the

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[34] Source: Africa's Financial Institutions (Wharton University Publication)

country. Currently, it plays an important role in the development of a cross-border payment system for the West African Monetary Zone.

3.2.2 East and Central Africa Banking Industry[35]

The countries in this region include Eritrea, Republic of the Congo, Central African Republic, Kenya, Congo Democratic, Mozambique, Malawi, Tanzania, Uganda, Rwanda, Ethiopia, and Cameroon. Each country in the region created a central bank shortly after independence in order to have full control over their financial markets. The Central Banks of these countries are all different and unique in their own ways, although their mission statements are very similar – in order to maintain price stability. Most of the countries suffer from high inflation, so maintaining stability in the money supply and currency is the number one priority of the central banks. The main sources of funds for banks are deposits from consumers. Depositing of funds is not a common trend in this particular region; the banks are therefore running at a low rate. Loans issued out to the private sector and funding of government expenditure are some sources of investment for banks in this region. This has led to privatisation of banks with the support of the IMF and World Bank. Countries like Kenya, Tanzania, Uganda, Rwanda and Cameroon mostly have privatised banks. Interest rate spreads range from 3.34% to 17.5%. The high bank spreads are indicative of the instability in the macroeconomic environment and the weak financial system. Interest spread is where the bank makes its money and covers the risk it takes on by lending money. The wider spread reflects the risk a bank is taking or the monopolistic nature of the banking sector in the region.

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[35] The central banks and commercial banking industries in this region have not been expansiated on, as majority suffer from underdeveloped banking industry

3.2.3 Southern Africa Banking Industry

Countries in Southern Africa are made up of Botswana, Comoros, Namibia, Sao Tome Principe, Seychelles, South Africa, Swaziland, Zambia and Zimbabwe. Countries in this region do not have a single Monetary Union governing all of them, unlike the West African countries. Each country operates differently and has its own characteristics and attributes. Botswana has one of the most elaborate banking systems in Africa. In controlling inflation, the bank uses interest rates and open market operations to influence aggregate demand[36].

Comoros - The financial system of Comoros is small and has a high banking concentration. It comprises the Bank des Comoros (the central bank), one commercial bank (Bank pour l'Industrie et le Commerce des Comores), and one development bank (Bank de Dévelopement des Comores). It is the government's intention to increase competition in the banking sector and it has granted license to the Bank de la Reunion to operate in the country. Access to credit for entrepreneurial activities in Comoros is hindered by the small and underdeveloped financial sector. Overall, the financial system lacks an effective regulatory framework that can facilitate dynamic business investment.

Namibia - Namibia's financial sector is robust and well-developed compared to most of its neighbours', but it is closely aligned with the state. Commercial banks, on average, are well capitalized at 15% of risk weighted assets[37]; the sector also benefits from a high savings rate, relative to other emerging economies.

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[36] Central Bank: Bank of Botswana (http://www.bankofbotswana.bw/index.php? section=402)
[37] As defined by the Basel Core Principles internationally recognized standard.

Seychelles - The banking sector in Seychelles has changed significantly as institutions have responded to the rapid development of the economy. Seychelles is served by six commercial banks. All the commercial banks are regulated by the Central Bank and are required to renew their licences annually. Barclays was the first bank to open a branch in Seychelles in the late 1950s. Prior to that time, banking was effectively handled by the local trading company Temoljees. Under the Savings Bank Act, the bank's lending activity was limited to small amounts for individuals but, under the Financial Institutions Act, it is free to provide working capital for corporate clients. Seychelles has a highly sophisticated banking system similar to that found in most developed countries, with most Seychellois having access to their own bank account, automatic teller machines, and credit/debit cards. All types of account are available including current, fixed deposits, call deposits, savings schemes and loan accounts; and all major credit cards are represented.

South Africa - The South African Banking system comprises the South Africa Reserve Bank; 55 locally controlled banks; five mutual banks; 12 foreign-controlled banks; and nine branches and 60 representative offices of foreign banks. South Africa's "Big Four" local banks, namely Absa, First National Bank (a division of First Rand National Bank), Standard Bank and Nedbank, provide retail and investment banking services in competition with a wide range of niche commercial banks. Notably, South African banks have been excluded from corporate banking due to more aggressive pricing at European, Malaysian and US banks operating in South Africa. In recent years, credit rating agencies such as Fitch and Standard & Poor's, concerned about South Africa's growth potential and macroeconomic stability, have downgraded the country's external credit rating outlook from 'stable' to 'negative'.

Swaziland - Swaziland's banking system has become shallower. Private sector lending, money supply, and bank deposits as a percentage of GDP have all declined since 1995. There are four authorized commercial banks in the country. The commercial banking system has largely concentrated on export financing while under serving a large portion of the adult population. This limited access to financing has reduced the amount of growth-enhancing investment projects in the country. As an added strain on the banking system, the nonbank financial institutions (NBFIs) that developed to fill the financial need have been inadequately regulated and supervised. The growth of the NBFIs in Swaziland has been affected by a combination of a relatively small financial sector and the high costs associated with using formal banking services. Access to banking services is generally not available to certain segments of the population such as those living in rural areas or those without steady incomes.

Zambia - The central aim of the Bank of Zambia (BoZ) is to formulate and implement monetary policies to ensure price and financial stability. Zambia's financial sector is relatively small and is dominated by banks. The sector, however, has one of the most liberal banking regimes in Southern Africa. The sector has experienced significant privatizations in recent years. As of December 2006, Zambia's banking sector consisted of 12 operational commercial banks, including several foreign-controlled banks. Concentration is high, with the five largest banks controlling the bulk of the assets. The Zambia National Commercial Bank, the only state bank and the country's largest domestic bank, which was privatized in 2006, controls 24% of the retail banking market. There is no formal deposit insurance system in Zambia.

Zimbabwe - In Zimbabwe, the Reserve Bank has, as its primary goal, the maintenance of the internal and external value of the Zimbabwean currency. The Bank is therefore responsible for the formulation and implementation of monetary policy, directed at ensuring low and stable inflation levels. The political problems facing Zimbabwe have affected every fabric of the society. As of January 2009 the banking sector consisted of 28 banking institutions, which are supervised by the Reserve Bank of Zimbabwe (RBZ).

3.3. Theoretical Literature Review

3.3.1 Financial Development and Economic Growth

Following the pioneering contributions of Schumpeter (1911), Gurley and Shaw (1955), Goldsmith (1969) and McKinnon (1973), the relationship between financial development and economic growth has remained an issue of debate over the years. A lot of studies have dealt with different aspects of this relationship, both at the theoretical and empirical level. Some studies[38] have attempted to establish whether financial development leads to increased growth and how strong the influence of financial markets are in influencing growth in the economy; while other studies have focused on identifying the channels of transmission through which financial intermediation affects growth. The broad consensus of these studies is that there is a strong positive relationship between financial development and economic growth. However, the relationship received a new source of inspiration with the "endogenous growth" literature, which suggested that financial markets can affect growth in the long run. A

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[38]See King and Levine (1993), Guidotti and Gregorio (1995), Rajan and Zingales (1998), Levine (2004), Demetriades and Andrianova (2005) and Luintel et al (2008).

more detailed literature on the endogenous growth will be discussed in a later sub-section.

First, this section will look at how the neo-classical growth model explains the interaction between financial system and economic growth. Growth is believed to depend largely on capital accumulation; that is, increasing the stock of capital goods to expand productive capacity. Another channel illustrated in the model is to increase net investment and the need for sufficient savings to finance investment through financial deepening (Solow 1956).

In the same vein, endogenous growth theory suggests that government policy to increase capital or foster the right kinds of investment in physical capital can permanently raise economic growth (Romer, 1986; Lucas, 1988). It also argues that a higher savings rate leads to higher economic growth. Financial development and economic growth received a strong theoretical foundation with regards to endogenous growth models with the work of Pagano (1993). A simple endogenous growth model, the "AK" model, was formulated, where aggregate output is a linear function of aggregate capital stock.

$$Y_t = AK_t \tag{1}$$

The production function above is a reduced form that can be derived from two underlying assumptions, the first one being capital K_t comprises physical and human capital as in Lucas (1988) or alternatively, a competitive economy where each firm faces a technology with a constant return to scale but a productivity with increasing function of the aggregate capital stock K_t. If the population is assumed to be stationary and the economy produces a single good that can be saved (invested) or consumed and

the invested good depreciates at the rate of δ per period, the gross investment at time t in the economy is:

$$I_t = K_{t+1} - (1-\delta)K_t \tag{2}$$

Assuming a closed economy with no government, capital market equilibrium requires that savings should equal investment.

$$S_t = I_t \tag{3}$$

However, considering that a proportion of the savings $1-\phi$ might be loss due to financial intermediation

$$\phi S_t = I_t \tag{4}$$

From equation (1), the growth rate at time $t+1$ then becomes: $g_{t+1} = \dfrac{Y_{t+1}}{Y_t} - 1 = \dfrac{K_{t+1}}{K_t} - 1$

Following from equation (2) and dropping the time indices, the steady-state growth rate can be represented as follows:

$$g = A\frac{I}{Y} - \delta = A\phi s - \delta \tag{5}$$

Where s is the gross saving rate S/Y Equation (5) illustrates how financial development can affect economic growth. The proportion of savings ϕ channelled to investment can be increased. A (the social marginal productivity of capital) can be influenced positively and lastly, s can also be increased; that is, the private saving rate of individuals.   In other words, financial development relates to economic growth through different channels[39].

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[39] Other channels through which financial development impacts on economic growth are increase in savings rate, effective allocation of resources, risk-bearing on highly risky profitable investments.

Greenwood and Jovanovic (1990), support the argument that financial development increases growth through efficient allocation of resources. In their model, capital may be invested in a safe, low-yield technology or a risky, high-yield one. The primary function of financial intermediaries (banks) is to channel funds to the most appropriate and profitable investments by using information gathered and analysed. They also enable investors to share risks involved in an investment. This allows individuals to share the uninsurable risk of idiosyncratic shocks such as liquidity shocks and the diversifiable risk resulting from the volatility of asset returns.

Similarly, Tsuru (2000) suggested that development of a financial sector affects the savings rate in three ways: financial markets can reduce idiosyncratic risks and thus lower the level of precautionary saving by households and slow down growth; secondly, a reduction in rate-of-return risks by portfolio diversification has ambiguous effects on saving; and thirdly, lowering liquidity constraints in the financial sector may lower the savings rate.

A contrary argument to financial development influencing growth positively is that some researchers believe economic growth facilitates financial development or the possibility of a two-way causal relationship. Greenwood and Jovanovic (1990) suggested that on one hand, growth process stimulates a greater participation in financial markets, thereby creating new financial institutions and expanding old ones. On the other hand, by gathering and analysing information from potential investors, financial institutions can utilise this effectively by allowing efficient investment projects and therefore stimulate investment and growth.

Blackburn and Hung (1996) also, identified a two-way causal relationship between growth and financial development. In their model, the lack of a financial sector means that every investor must individually monitor projects, so that the costs of monitoring are excessive. Within a well-developed financial sector, monitoring tasks are delegated to intermediaries. Transaction costs are reduced and more savings can be allotted to investments that produce new technology. Ultimately, this promotes economic growth.

3.3.2. The Banking Sector and Economic Growth

A well-developed financial system should have also exhibit a sound banking system. Banks can help firms with essential finance by taking up productive investment opportunities which may not materialize if the finance was not available. Also, adequate screening of loan applicants helps channel funds into the appropriate use. Free entry into the industry as long as the requirements are met ensures competitiveness, which improves the quality of bank services. Harrison et al (1999) constructed a model in which there is a two-way causal effect between economic growth and financial sector development.

The banking sector was their main focus: they argue that economic growth increases banking activity and profits, which promotes the entry of more banks. The greater availability of banking services reduces the non-physical and physical distance between banks and clients, which, in turn, lowers transaction costs. They argue that, in effect, this will create regional specialisation. However, the negative effect of increased output will be an increase in the cost of financial intermediation. This is because increase in output will raise wages and this will increase the cost of financial intermediation. They

further explained the effect of specialization and wage increase, which has significant influence on growth.

The cost of financial intermediation reflects how the financial sector affects other sectors in the economy. The variable should therefore be monitored in order to maximise its positive influence on economic growth. Along similar lines, Pagano (1993), Bencivenga (1991), and Guidotti and Gregorio (1995), amongst others, arrived at similar conclusions regarding how financial systems using banks as their main focus can influence economic growth. Following Pagano (1993), Kessy (2008) added two more possible areas in which financial systems can positively affect growth. The five transmission channels increase capital productivity and accumulation which increases growth. They are: *(a). Mobilise savings* - the provision of saving facilities enables households to store their money in a secure place until it is needed. The money can be then be utilised productively by lending it to individuals or enterprises to finance projects or investments.

(b). Allocate resources - Anderson (2003) suggested that economic growth can be accelerated by allocating resources effectively. That is, resources should be allocated to higher return projects. Individuals are unlikely to have the time or capacity to collect, process and compare information on many different enterprises, managers or market conditions before choosing to invest. They will also be less likely to invest in activities about which they have little or no information. Therefore high information cost may prevent capital flow. Financial intermediaries that specialise in acquiring and evaluating information on potential investment projects enable small investors to locate higher

return investments, for a small fee. This improved allocation of savings among investment projects should accelerate growth.

(c). Exert corporate control – the right to exercises controls over management of resources. The ability of banks to monitor the performance of enterprises on behalf of many investors who would not otherwise do so themselves and to exercise corporate control (e.g. lenders holding meetings with borrowers to discuss business strategy) helps to reduce mismanagement of resources and ensures investors receive proper returns on their investment. Financial arrangements that improve corporate control tend to promote faster capital accumulation and growth by improving the allocation of capital (Bencivenga and Smith, 1991).

(d). Facilitate risk management - Banks can be specially positioned to mediate across maturities; they facilitate the ease of managing risks. Many enterprises require a medium to long term commitment of capital, whereas most individual savers prefer the option to draw on their savings as and when the need arises. In other words, they prefer their savings to be "liquid". Banks accept funds from investors who desire to lend for the short term and in turn lend to borrowers who desire long term maturities. Therefore, borrowers and lenders with different preferred maturities are not compelled to agree on a common maturity. This is possible because banks can combine different household savings and it is expected or assumed that not all households will withdraw their money at the same time. Also, banks bear the risk of borrowing at volatile short term rates and lending at stable long term rates. By doing this, they ensure capital is allocated to the best projects, even if they require a long term financial commitment (Kessy, 2008).

(e). Simplify trading of goods & services - banks serve as middleman for importers and exporters, and also as agent for goods transaction amongst countries. Payments made into bank accounts encourage transparent and legal transactions. Also, foreign exchange services encourage the ease of international trade. Financial systems (banks) reduce market frictions[40] and reduce costs arising from the conclusion of contracts and the need to enforce them.

Another area through which a banking sector promotes growth is Research & Development and human capital accumulation. A growing sector is assumed to need more human capital; especially with banks, more labour input will be needed to monitor investments and information gathering. With the ease of getting loans and less credit constraints, new firms or young firms can expand their production demands for more labour. However, a country with a vibrant banking sector can still have stunted growth if firms are not managed properly or the rule of law is weak.

3.3.3. Banks- Market Structure and Economic Growth

A new area of research to which researchers are paying detailed attention is the structure of the financial market and the regulatory environment in which banks operate. Financial market structure is a broad concept reflecting a specific organization of the financial system. The structure is shaped by institutions (such as supervisory or regulatory authorities), the financial technology (such as the payment system), the rules of the game that define how financial activity is organized (such as investor protection regulations), and the degree to which banks are concentrated. The complexity of the

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[40]Market frictions, which increase trading costs, are the outcome of asymmetric information between investors and savers.

structure of financial markets has made researchers focus on selected aspects. For instance, La Porta et al. (1997) focused on investor protection regulations. They argued that countries with poorer investor protection and poorer law enforcement have less developed financial systems. They provided evidence that financial systems are better developed in countries with a higher degree of investor protection (depositors can also be regarded as investors).

Deidda and Fattouh (2002) analysed the market structure of banks in terms of concentration in the banking industry. They found that concentration negatively influences growth in low income countries but has a positive effect in high income countries. These findings suggest that banking concentration and growth are dependent on the level of economic development. Concentration occurs as a result of an institutional environment shaped by large players or technological innovation. Large banks may have an influence on bank regulation, taxes, foreign bank entry or the transparency and accuracy of the accounting standard. A highly concentrated banking sector may affect growth negatively because a purely monopolistic market tends to impose welfare losses, compared with the benchmark of a competitive market.

As Pagano (1993) shows, market power allows banks to charge higher loan rates and offer savers lower deposit rates. An increased net interest rate margin reduces the equilibrium quantity of funds available for credit and therefore also the rate at which an economy can grow[41]. Another channel through which a monopolistic banking market negatively affects economic growth was shown by Guzman (2000). Within a general equilibrium framework he concluded that large banks tend to depress capital

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[41] Hence the allocation of the competitive banking market would be Pareto preferred to the monopolistic banking market. Banks of course would make a lower (zero) profit in the competitive environment. However, the comparative loss banks suffer could be compensated by the gain debtors make.

accumulation via either credit rationing and/or excessive monitoring, as relatively high loan rates induce entrepreneurs to undertake riskier projects. A concentrated banking industry reduces competition. According to Clasessens et al. (2004), the degree of competition in the financial sector can affect the access of firms and households to financial services, which in turn influences the overall economic growth. In other words, competition in the financial sector lowers the cost of intermediation. Besanko and Thakor (1992) argued that a more competitive banking system leads to higher growth rates.

Recent evidence, however, has shown that concentration can have a positive influence on economic growth. Mayer (2000) reports in his paper that the small local banks which made a substantial contribution to the development of British manufacturing in the first half of the 19th century suffered a major setback in the period between 1809 and 1830, during which time 311 banks went bankrupt (more than one third of British banks at that time). Triggered by the crisis, depositor protection was enhanced at the expense of competition, concentration increased and the geographic distribution of banks' operations widened considerably. Hence, regulation that promoted depositor protection led not only to increased financial stability but also fuelled concentration in the banking sector.

At the same time, a highly concentrated banking sector may enhance growth due to its stronger resistance to financial crises, as larger banks tend to spread their activities geographically. Furthermore, Shaffer (1998) shows that more fragmented banking markets may have a pool of less qualitative borrowers compared to a banking sector with few large banks, as rejected fund seekers can take advantage of imperfect

screening technologies and continue to apply to other banks so that "lemons", i.e. credit seekers with a relatively inferior creditworthiness, remain in the market.

Also, concentrated banking sectors may take advantage of economies of scale in the production of banking services (cost savings due to consolidating the output of different banks). As a consequence, potential cost savings may lead to banks with a higher market share and a superior cost structure[42]. Another feature of the positive growth impact of large banks was shown by Petersen and Rajan (1995). Monopolistic banks may have an incentive to pursue profitable projects that are only successful in the longer term, whereas in a competitive banking market such investments would have a lower probability of getting funded. The rationale for this is that, in a market with many banks, project returns are not necessarily earned by those who initially subsidize the firms. Hence, in a fragmented market there are diminished incentives to initially subsidize risky long term projects, as firms may be forced out by competitor banks. Consequently, young and unknown firms with no track record with profitable but risky long term projects have a higher chance of getting funded in a concentrated banking market.

Another area by which market structure is measured is by bank ownership, entry into the market and government regulation. La Porta et al. (2002) provide evidence that higher government ownership of banks is associated with slower subsequent financial development and lower growth of real GDP per capita. Demirguc-Kunt et al. (2003) provide evidence that regulations on bank entry, restrictions on bank activities, and regulations that restrain the freedom of banks to conduct their business boost banks' net

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[42] However, investigations on the country-specific cost curves of the banking sector (for the USA. as well as Europe) could not find empirical evidence for a robust relationship between concentration and banking sector efficiency (see for instance Demirgu‹c_-Kunt et al., 2003).

interest margins. In turn, the function of the financial system to transfer available resources to the most efficient means is hampered.

With regards to the influence of government regulation of the banking sector on economic growth there are two conflicting views. The development view emphasizes positive effects on real GDP growth while the political economy view does not. Hellmann et al. (1996) argue that for developing countries with a poor institutional structure, governments may promote the stability of the financial system through a set of financial policies (deposit rate controls, lending rate controls, reserve requirements, capital base, and restrictions on entry). Such financial policies are set to create rent opportunities for the private sector and enhance the soundness of the financial system. Yet, good intentions of governments do not always materialize.

Against this background, a lot of countries in SSA have had reforms that brought about mergers and acquisitions. For example, Nigeria had banking sector reform in 2005 that saw the banks in the country reduced from 89 to 24. The present study is one of very few examining the effect of banking sector concentration on economic growth from a cross- country perspective. Most of the studies on the growth impact of banking sector concentration are country-specific (e.g. Petersen and Rajan, 1995). At the cross-country level, Cetorelli and Gambera (2001) provide evidence that concentration has a depressing impact on all industry sectors, and hence also economy wide. This chapter tries to contribute to understanding of the impact of financial market structure on economic growth by examining the effect of regulatory environment proxy by rule of law (also known as investor protection rights) and regulatory quality on growth, and

also by investigating if a highly concentrated bank positively or negatively influences economic growth.

3.4 Empirical Literature Review

Empirical evidence on the influence of financial institutions on economic growth for most developed countries is largely inconsistent. Also, very little work has been done on emerging markets, especially African economies. Some contemporary empirical work such as King and Levine (1993), Demirguce-Kunt and Maksimovic (1998), Levine, Loayza and Beck (2002), and Ahmad and Malik (2009), showed that broader, deeper financial markets are strongly associated with economic growth. King and Levine (1993), one of the most influential studies in financial development and economic growth, found a strong and statistically significant link between financial liquidity measures and growth, and argued for a causal relationship that runs from financial development to growth and not vice versa.

They measured financial sector development with four indicators: the amount of liquid liabilities divided by GDP, the importance of commercial banks in relation to the central bank when allocating credit, the ratio of credit allocated to private enterprises to total domestic credit, and credit to private sector divided by GDP, after controlling for other factors affecting economic growth. This however, contradicts the findings of Greenwood and Jovanovic (1990): they reported a two-way causal effect of financial development and economic growth. Rajan and Zingales (1998) also strongly criticised some of the variables used for measuring financial sector development in King and Levine (1993). They argue that growth of the financial sector and economic growth can be driven by a common variable such as the savings rate, and the amount of credit and

size of the stock market may predict economic growth. With the exception of causality issues, the King and Levine proposition appears to be a generally accepted opinion[43]. Studies using cross-country analysis always tend to find causality running from financial development to economic growth (Koivu 2002). However, the direction of causality still remains inconclusive, as different authors find causality running from both directions. Apart from determining causality, cross-country regressions have been heavily criticised for ignoring large differences between countries (Aretis & Demetriades 1997; Neusser & Kugler 1998) and it has been suggested that results are not reliable due to volatility of the long time series used (Quah 1993). Rousseau and Watchel (2000) also criticised the ability of cross-country regression to explain the direction of causality. They argued that often the mechanism of measuring financial sector developments remains correlated with other contemporary measures. In other words, when banks foresee higher economic growth, they may allocate more credit.

In recent years, panel data analysis and time series have dominated the economic research analysing the relationship between growth and financial development. There have been mixed conclusions, although the majority of the results reported conclude that financial development does increase economic growth. Empirical studies have also shown that results differ from low income countries to high income countries. High-income countries tend to have larger and more efficient banking systems than the low-income or middle-income countries. Deidda and Fattouh (2002) suggested that in low income countries there is no significant relationship between financial development and growth, whereas in high income countries they find this relationship positive and

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[43] See Rajan and Zingales (1998) and King and Levine (1993) for detailed reviews.

strongly significant. It therefore means that financial development is not linked to higher growth rates at all levels of economic development.

Using GMM dynamic panel estimation for 74 countries for a period of 35 years, Rioja and Valev (2004) expressed similar views to those of Deidda and Fattouh (2002). The countries in the data were divided into three groups based on the development of the financial sector: the low region, the middle region and the high region. Their findings indicate that, in the countries with low financial development, additional development in the sector did not have an obvious effect on economic growth, depending on the financial indicator used. The results were either positive (if ratio of commercial banks' assets to commercial banks and central was used) or nonexistent (if share of credit to private sector to GDP was used as an indicator). In countries where financial development was considered mid-region, the effect of financial development shows a strong positive effect on economic growth. In the high-region, growth of the financial sector has little or no effect. This might be because, at a certain point, the effect of growth in the financial sector on economic growth declines when it reaches a certain threshold. It therefore implies that countries with low financial development benefit from having an increase in economic growth as a result of development in the financial sector.

The issue of time period has also been significant in studying the relationship between financial sector and growth. Loazya and Ranciere (2005) distinguished between short and long run effects of financial deepening to growth. They found that in the long run financial development supports and promotes economic growth. However, bank crises, cycles of booms and bust and volatility of the financial sector can harm economic

growth in the short run. A strong financial system leads to increased growth and a weak one has negative consequences on economic growth. Similarly, Rousseau and Wachtel (2007) suggested that the relationship between growth and financial development weakens over time; recent data with a smaller time period (1990-2003)[44] was used; the results obtained indicated that the effect of financial development on growth was no longer significant. This, they believed, was due to the bank crisis in the 1990s. The overall findings suggested a thin line between financial deepening that comes from the increase in financial activity and one that is a consequence of a credit boom. It was concluded that to better understand the relationship between finance and growth, a systemic study of the financial development experience of individual countries was essential.

3.4.1 Banks- Market Structure and Economic Growth

Evidence suggest that banks in highly concentrated local markets have larger overhead expenditures, charge higher rates on loans, pay lower rates on deposits and are slower to reduce rates in response to Federal reserve reductions in interest rates than banks in less concentrated markets[45]. Contrary to this view are the studies of Graddy and Kyle (1979) and Smirlock (1985). They find that interest rate spreads are narrower in a concentrated banking system; while Keeley and Zimmerman (1985) reported more mixed results. Berger, Saunders, Scalise and Udell (1998) found that the best performing banks are generally not located in highly concentrated markets; and Rajan and Peterson (1995) found that firms are less credit constrained in more concentrated banking markets. Over the years mergers and acquisitions have been known to increase bank concentration. To

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[44] Previous studies used time period 1960 to 1989.
[45] See Berger and Hannan (1989, 1998) and Neumark and Sharpe (1992)

the researcher's knowledge there is no unambiguous evidence that mergers and acquisitions that increase bank concentration steadily lower deposit rates and increase bank profitability[46]. A highly concentrated banking sector reduces competition.

With similar views to Rajan and Peterson (1995), Claessens and Laeven (2005) reported empirical evidence suggesting that bank competition[47] fosters industrial growth and helps particularly in financing private and small firms that are perceived to be engines of economic growth (Cetorelli and Strahan, 2006; Giannetti and Ongena, 2005). According to Champonnois (2007), an economy experiences a vicious circle in which the numbers of firms and banks eventually increase and converge to equilibrium with high aggregate investment and high welfare. In some cases, however, when the initial numbers of firms and banks is very low, the economy experiences a vicious circle in which banks and firms exit and aggregate investment eventually decreases. It has been shown theoretically that the degree of competition in the financial sector can affect the access of firms to external financing (Vives, 2011). In addition, Champonnois (2007) suggests that if the number of banks increases, there is more bank competition and the profit of entrepreneurs' increases.

Claessens and Laeven (2005) suggest that less competitive systems may lead to easier access to external financing because, with more market power, banks are more inclined to invest in information acquisition and relationships with borrowers. However, when banking systems are less competitive (that is, a concentrated banking sector) hold-up problems[48] may lead borrowers to be less willing to enter such relationships, thereby reducing the effective demand for external financing. Also, less competitive banking

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[46] See Peterson and Rajan (1994), Simons and Stavins (1998) and Prager and Hannan (1999).

[47] A highly concentrated sector means there is little or no competition. Concentration and competition will be used interchangeably; it therefore implies that a competitive market is not a concentrated one.

[48] The degree of hold-up problems in the system may vary with the availability of financing options outside of the banking system, such as from capital markets.

systems can exhibit low quality of services, thereby a negative effect on demand for external financing and this causes reduced growth. These effects may vary according to the degree of competition in the country's overall financial sector. In effect, Claessens and Laeven (2003) and Cetorelli and Strahan (2006) have argued that the theoretical prediction of the effects of bank competition on growth is unclear; although there is a relationship between bank competition and economic growth, the direction of this relationship, however, is unclear, hence the need for further investigation.

3.4.2. Institutional Variables, Financial Markets and Economic Growth

Institutions and finance are separately emerging as essential determinants of economic growth in recent literature. Institutions are the rules of the game in a society by which the members of a society interact and shape the economic behaviour of agents. They may be treated as 'social technologies' in the operation of productive economic activities (Nelson and Sampat, 2001). When the rules change repeatedly or are not respected and corruption is widespread, or when property rights are not well defined or enforced, markets - especially financial markets - will not function well, uncertainty will be high, and, as a result, the allocation of resources will be adversely affected. A number of recent papers provide empirical evidence that confirms the importance of institutional quality for economic performance. Mauro (1995) demonstrated that the countries that have a higher corruption index tend to have persistently lower growth. Levine (1997) examined how the legal environment affects financial development and consequently growth. His results are consistent with the theory that the legal and regulatory environments materially affect financial intermediary development; while Pistor et al. (1998) highlighted the role of law and legal systems in promoting Asian economic growth.

Also, Aghion et al. (2005) found strong evidence suggesting a strong legal system facilitates private credit, thereby increasing investment and growth. A poor regulatory environment, which can occur as a result of a weak legal system, can adversely affect economic growth. An inefficient legal system will lead to increases in soft budget constraints and a seemingly larger or more developed banking system through granting of large amounts of bank credit to refinance inefficient projects, which may limit the contribution of banking sector development to economic growth. An inefficient legal system can also lead to poor legal protection for investors and weak legal enforcement, which usually leads to costly and time-consuming liquidation procedures. If liquidation procedures are expected to be too costly, banks may prefer to refinance bad projects rather than liquidate them.

Liang (2007) reported a negative effect of banking sector development on economic growth in China as a result of a deficient legal system; a sizeable amount of loans allocated to the public sector were inefficient and therefore limited the contribution of banks to economic growth. Demetriades and Law (2006) found that financial development has larger effects on economic development when the financial system is integrated within a sound institutional framework. This finding was mostly true for poor countries where more finance may or may not bring significant benefits. They concluded that for poor countries, improvements in institutional quality would mean larger direct effects on economic growth than having finance on its own.

3.4.3. Banking Sector Development, Economic Growth and Unemployment

There is little historical link between banking development and unemployment. The significance of more banks and branches opening should mean more jobs are being created in theory. The literature linked to analysing this phenomenon is by Collender and Shaffer (2002). They analysed the impact of firm size to job growth in United States' metropolitan areas. They found that smaller firms had created more jobs than the larger ones and that this was due to the banking structure of the economy. However, jobs in the smaller firms were less permanent than those at the larger firms because of the higher failure rates of smaller firms (ibid Rob, 1995). They further suggested that reduced lending to smaller firms could impair job growth and thereby restrict economic growth overall. Consequently, even if there is a restructuring of the banking industry lending from smaller firms to larger ones the overall, macroeconomic impact on employment and growth would remain an open empirical question.

However, Shaffer (2006) provides evidence that employment has grown faster in countries with smaller firm sizes. This chapter follows this theory by analysing if the recent development in the SSA banking industry has had any effect in creating more jobs in the economy. Another angle to this research - which is outside the scope of this chapter - is to examine the effect of financial deepening on firms in terms of increased investment and if this effect has directly or indirectly caused firms to increase the number of people employed in their organisations. The chapter also explores how the degree of regulatory restrictions affects the empirical relationship between banking market power and economic growth.

The review of the theoretical and empirical evidence presented in this section thus far points to the interesting interactions between banking sector development, bank concentration, unemployment and economic growth. It is worth emphasising that taking all interactions into account, empirical evidence is limited for developing countries, most especially African ones.

3.5 Research Hypotheses

Based on the theoretical predictions and the evidence discussed in Section 3 as well as the background information highlighted in Section 2, a number of testable hypotheses are formulated. The relationship between banking sector development and economic growth emphasized by Barro (1991) and King and Levine (1993) concludes that development in financial markets leads to economic growth. This is also supported by Odedokun (1996) and Christopoulos and Tsionas (2004). Financial deepening propels economic growth through both a rapid capital accumulation and productivity growth, with the latter channel being the strongest. The recent reforms in financial institutions in Sub-Saharan countries - banks in particular - has enabled the region to boast of some banks having sophisticated services and even to open branches in Europe, enabling financial deepening. Thus, banking sector development is expected to yield a positive effect on growth. This expectation leads to the first hypothesis:

H1: Banking sector development will have a significant positive effect on economic growth.

The relationship between market structure and growth offers mixed evidence. Petersen and Rajan (1995) and Bonaccorsi and Dell'Ariccia (2004) offer evidence that firms face less credit constraint if the banking sector is concentrated. However, Cetorelli and Gambera (2001) find that although some firms and industries may benefit from banking concentration, the overall effect on economic growth is negative. Also, Black and Stranhan (2002) find less concentration leads to more firms being created. Deidda and Fattouh (2002) reported a negative impact of concentration for low income countries but no significant effect for high-income countries. Given that banks in SSA are relatively competitive - although some countries have high banking concentration - hence, the second hypothesis is:

H2: Economic growth increases with less concentration or vice versa, in effect, a competitive banking sector should yield faster growth.

Finally, the regulatory environment in which banks operate determines the allocation of loans and financing of state-owned budgets. Levine et al (2002) offers evidence on how the regulatory environment can influence credit given out by banks and the soundness of the legal system. A seemingly large bank might be offering low quality services as a result of the legal system. The last hypothesis tested is thus:

H3: A sound legal system and restrictive regulatory environment strengthens financial development which in effect promotes growth

3.6 Methodology and Data

To capture the potential effects of bank development on growth, this chapter adopts the Cobb-Douglas production function, and closely follows the specification of Pagano (1993) and Jacek (2006). Consider that an economy produces a final goods output according to the following production function:

$$Y = AL^{1-\alpha}K^{\alpha} \tag{6}$$

with A being the overall efficiency factor, including not only level of technology, but also representing quality of government management of the economy and institutional factors.

L in equation (6) denotes labour and K represents physical capital formed as composite of G - intermediate goods and quality adjusted goods. Using the Spence-Dixit-Stiglitz structure, physical capital K is written as:

$$K = \left\{ \sum_{n=1}^{G} X_{n,k_n}^{\alpha} \right\}^{1/\alpha} = \left\{ \sum_{n=1}^{G} (\eta^{kn} X_{n,k_n})^{\alpha} \right\}^{1/\alpha} \tag{7}$$

Each intermediate good has a quality ladder along which improvements can occur. This model assumes that quality grades of each type of intermediate are perfect substitutes. It allows for creative destruction as new types drive out old ones. These improvements build on new technology, new information and ideas, and the standard learning-by-doing externality. This increases the productivity level by the factor η. Therefore k_n illustrates improvements in quality in sector n. According to Barro and Sala-i-martin (1995), an innovation which increases productivity in the economy is assumed to arrive randomly with a Poisson arrival rate $a_n k_n$.

Following Jacek (2006), increase in productivity which consequently increases growth in the economy depends primarily on resource allocation to research and development in sector n. In our model, new ideas, increased level of technology and learning-by-doing are embedded in the term Research and Development; this improves the quality of products provided by sector n.

The ability to come up with new innovation and ideas that improve product services and efficiency might involve a cost. It is assumed that invention costs something, ψ, but if technology is non-rival and non-excludible, once invented, technology can be used by all producers without cost. The probability of success in the innovation process determines how long the monopolist[49] enjoys the stream of profit. The expected present value of the profit from $k_n th$ innovation in sector n is given by:

$$E(V_{n,k_n}) = \frac{\pi_{n,k_n}}{r + a_{n,k_n}} \tag{8}$$

The equation above illustrates the expected reward from inventing a new idea or product in sector n. This value weighed against the cost of R&D allows the investor to make a choice of whether to go ahead and invest. If $V > \psi$, there will be infinite R&D, $V < \psi$ implies zero R&D and $V = \psi$, gives a positive finite R&D which implies free entry condition.

This approach is extended to allow for market imperfections and financial systems. It is assumed that firms in sector n will engage in R&D activity if expected profits are at least higher than the cost of improving the existing intermediate good n. In this model for simplicity, it is assumed that all firms cannot finance R&D activities internally;

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[49] The monopolist here is the inventor of the new idea or new quality product and how along he enjoys profit before competition sets in.

hence, the need for external finance - this is assumed to be costlier than internal funding due to asymmetry information between lenders and borrowers. Jensen and Meckling (1976) suggest that external funds are generally costlier because lenders have less control over the borrower's action. Myers and Majluf (1984) also stress the problem of moral hazard and highlight that lenders know less about what the borrowers will do with the funds; the price of capital is therefore higher to compensate for the risk involved to the lenders. The difference between the costs of internal and external funding can also be from agency and monitoring costs.

Development in the banking sector is assumed to reduce the cost associated with external funding, especially for firms highly dependent on external funding to survive, thereby increasing the chances of more investment, which enhances growth. It is assumed that at some point in time a firm will need external finance to invest into new innovation and ideas, irrespective of the sector in which it operates. This is plausible for firms in developing countries[50]. Supporting this argument, Deidda and Fattouh (2002) reported firms in low income countries rely more on external finance. This is different from the assumption of Jacek (2006), who believed that external financing is dependent on the sector in which the firm operates. External dependence therefore takes the form:

$$B_{n,k_n}^* = B_{n,k_n} \cdot \left(1 + \beta_n\right) \tag{9}$$

Where B_{n,k_n} denotes expenditure effectively employed in research processes and β_n is the parameter of the external finance dependence. The higher β_n is, the more resources must be applied to keep efficient expenses constant across sectors. No assumption is given to the functional form of β_n but some time-varying precise amount is allocated to

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[50] In a developed country, the extent of reliance on external funding might depend on the sector as sectors like computing & IT would want to invest more in R&D than sectors like Leather & Tobacco. This assumption therefore can only be true for developing countries.

cover the cost of external funding. Bank development is expected to reduce the difference in cost between external and internal funding, thereby increasing investment and ultimately growth. The expected reward per unit of time for pursuing a new idea or $(k_n + 1)th$ innovation is $a_n k_n . E(V_{n,k_{n+1}})$. Therefore, the likely flow of profit from investment in sector n at quality step k_n is:

$$\prod_{n,k_n} = a_{n,k_n} * E(V_{n,k_n+1}) - B_{n,k_n}^* \tag{10}$$

In a free-entry condition, equilibrium is attained where expected profit equals the cost of investment; there is no extra profit from inventing a higher quality product, in this case profit will be zero ($\prod_{n,k_n} = 0$). That is:

$$B_{n,k_n} * \left\{ \theta(k_n) * E(V_{n,k_n+1}) - (1 + \beta_n) \right\} = 0 \tag{11}$$

Using the above equation, it therefore implies that the probability of a successful investment or innovation must be greater than the cost of innovation per unit of time and it is given by the following equation:

$$p_n = \theta(k_n)\pi_{n,k_n} . (1 + \beta_n)^{-1} - r \tag{12}$$

In equilibrium, it is assumed that population growth is zero and labour is constant as well. Growth in Y is dependent on overall growth in the innovations, that is, new ideas and innovations that causes firms to invest. The steady state equilibrium function is given as follows:

$$y = \frac{\lambda(\mu \sum_{n=1}^{M} \varphi(n)(1 + \beta_n)^{-1} - \rho}{\phi\lambda + 1} \tag{13}$$

λ and μ are functions of the parameters and constants in the model while φ represents different industries in the economy. The above equation ends the derivation of the theoretical model. From equation (12), changes in β_n will influence changes in the growth rate of the economy, implying that cost associated with external finance

negatively influences economic growth. The model developed is to be considered as an extension of the standard "creative destruction" approach. The extension allows us to introduce financial markets (Banks) and to explain the relationship between finance and growth in a simple system.

The model also takes into consideration how concentration of the banking sector affects the changes in B_n: a highly concentrated banking industry will exercise some monopoly power which might in effect make external finance more costly for firms. Banks with monopoly power would determine, with respect to perfect competition, equilibrium with higher loan rates and a smaller quantity of loanable funds. This would clearly reduce growth in the economy. Petersen and Rajan (1995) developed a model contrary to this argument, stating that a bank can establish lending relationships with young firms with no record of performance, therefore bearing the information cost if it can share in their future streams of profits, should they turn out to be successful.

Ceterolli and Gambera (1999) also show that banking sector concentration promotes economic growth in industries highly dependent on external finance by facilitating credit access to firms, especially to the younger ones. The model developed in this section acknowledges a developed financial system and the structure of the market plays a vital role in reducing the cost associated with external financing. This study uses banks as a particular reference; the better the quality of financial institutions, the lower the cost of acquiring some additional finance and, hence, the faster the growth of the economy.

3.6.1 Data

The study uses panel dataset for 46 countries from the period 1997-2010. The sample selection was guided by the availability of data, and period length is also restricted because the main data source for bank-level variables is from BankScope.

A. Banking Sector Variables

Development in the banking sector is difficult to measure in terms of what proxies to use; this research therefore measures the efficiency of this sector as an indicator of the development. *Profit before tax*, *domestic credit to private sector* and *Return on Asset* are used as efficiency indicators. The *Return on Asset* is defined as the ratio of net interest income to total assets. It measures the profit per dollar of assets. It reflects how well bank management use a bank's investment resources to generate profits. *ROA*, being an accounting measure of performance has been criticized because it suffers from the effect of other accounting standards. However, other measures of market performance are not without limitations. Demsetz and Lehn (1985) suggest that *ROA* better reflects current business conditions as growth is positively linked to investment and higher profits would result in higher investment and therefore promote growth. This variable is also linked to Naceur (2003) and San et al. (2011).

Domestic credit to private sector which is the amount of credit allocated to the private sector that is, loans made by banks to private firms and households. The variable is expected to be positively associated to economic growth because lending behaviour of the banks is market-oriented and profit based.

B. Concentration

Bank concentration equals the sum of squared market share of each bank in the industry. That is:

$$HHI_{mt} = \sum_{i=1}^{Nj}(totalassets_{imt} / \sum_{i=1}^{Nj} totalbankingassets_{imt})^2$$

Where HHI_{mt} (Herfindahl-Hirschman Index) is the HHI for country m at time t; assets$_{imt}$ represent total assets by bank i in country m at time t. Higher values of HHI indicate more concentration and less competitive markets. Concentration can also be measured using the fraction of bank assets held by the five largest commercial banks in the country and averages over 2002-2010. Bank concentration is computed using the bank-level data from the BankScope database. Concentration might have either a positive or negative effect on economic growth. Nicolo et al. (2004) find that highly concentrated banking sectors exhibited levels of systemic risk potentially higher than less concentrated systems during the period 1993-2000. In contrast, Beck et al. (2005) indicate that crises are less likely in a more concentrated banking sector. As this section proceeds in the description of empirical results, additional variables will be introduced for robustness tests.

C. Regulatory and Institutional Variables

The first regulatory variable to be examined is *Rule of Law*, which is always difficult to measure. A dimension of the rule of law that has been shown to affect economic growth is the awareness and respect of property rights, particularly intellectual property (Hansen et al., 2009). This variable is measured as property rights and rule based governance with -2.5 as the lowest and 2.5 as the highest. Gould and Gruben (1996), utilising a cross country data on patent protection, trade regime and country specific characteristics, provide evidence suggesting that property protection is a significant determinant of economic growth. Park and Ginarte (1997) reported that property rights affect economic growth indirectly by stimulating R&D and the accumulation of physical capital.

Regulatory Quality can have different interpretations, depending on the institutional and administrative context in which it is used (Radaelli and De Francesco, 2007). In this chapter, regulatory quality is explained as the perception of the ability of government to formulate and execute sound policies and regulations that permit and promote private sector development. The world average for the variable is zero (0); a country with a value above the average is said to be doing really well in terms of regulatory quality, while a country below zero is doing very badly. Most African countries have a value below the world average.

Government Effectiveness reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

Government Expenditure includes government purchases on goods and services, national security and defence, and compensation to employees. Increasing government expenditure will have an adverse effect of the overall growth of the economy. This variable is added as a factor variable that can influence growth negatively; increasing government expenditure can also influence banks: if the government borrows from banks, repayment might be an issue and causes soft budget constraints.

D. Macroeconomic and Control Variables

This study uses growth rate of real GDP to measure economic growth. Positive growth in the banking sector which is extended to firms by issuing of loans and investing in profitable business should consequently influence growth rate positively.

Inflation is mostly used as a measure of macroeconomic stability. Boyd, Levine and Smith (2001) show that countries with high inflation tend to have underdeveloped financial systems and banks. Huybens and Smith (1999) developed a theoretical model

in which interest rate margins rise in the presence of inflation. Thus, the researcher controlled for inflation and its effect on banking sector variables. It is expected that high inflation tends to reduce growth due to high price levels and low real income. De Melo et al (1996), Berg et al (1999), and Grogan and Moers (2001) all found significant negative effects of inflation on economic growth.

Trade is the ratio of import and export as a percentage of GDP. The variable is expected to have a positive link with economic growth

Net Interest Revenue, O*verheads*, *Equity* and *Ratio of Equity to total assets* are bank specific control variables. Ratio of equity to total assets is sometimes used as leverage for the banking sector; a high leverage signifies that banks are growing rapidly or giving out too many loans which may have an adverse effect in the industry and the economy in general. Banks are required to keep a minimum level of equity in relation to total assets.

3.6.2. Regression Specification

This study uses five different regression specifications to study the link between economic growth and the development of the banking industry. Following, Bayraktar and Wang (2008), Caporale et al. (2009), and Collender and Shaffer (2009), the basic regression equation is as follows:

$$y_{it} = \alpha + \beta_0 EFI_{it} + \beta_1 CON_{it} + \beta_2 RV_{it} + \beta_3 CV_{it} + \mu_i + \varepsilon_{it} \qquad (14)$$

In this model, y_{it} is the growth rate of real GDP in country i at time t; $EFI_{it,}$ is the efficiency indicator for banking development which consist of Return on Asset, profit before tax and domestic credit to the private sector. CON_{it}, is the measure of concentration using the HHI index. $RV_{it,}$ are regulatory or institutional variables that

regulate the banks and the economy as a whole. In this study we limit the regulatory variables to Rule of law and Reserve requirement. We also use government consumption expenditure as an external variable that can have an impact on the growth of the economy.

CV_{it}, consists of macroeconomic and banking sector control variables; overheads, deposit and short term borrowing, ratio of equity to total asset, inflation and trade balance. μ_i, represents unobservable country-specific effect, ε_{it}, is the error term and α is the constant term. An important issue concerning the relationship between banking development and economic growth is the difficulty of identifying proxies to measure the development in the industry. In our analysis, we consider the efficiency of the banking sector as a measure of the development in the sector; hence, the need for efficiency indicators. The estimated model is as follows:

$$GDP_{it} = \alpha + \beta_0 gdp_{i,t-1} + \beta_1 dctps_{i,t} + \beta_2 roa_{i,t} + \beta_3 hhi_{i,t} + \beta_4 \inf_{i,t} + \beta_5 RV_{i,t} + \mu_i + \varepsilon_{i,t}$$

(15)

Where gdp = real GDP growth rate; $dctps$ = domestic credit to private sector; roa = return on asset HHI= hhi index, inf = inflation and RV consists of rule of law; regulatory quality, government effectiveness and government expenditure

The generalized Method of Moments (GMM) methodology proposed by Arellano and Bond (1991) and later further developed by Blundell and Bond (1998) is used here to control for endogeneity in the growth regression. The GMM estimator is also used to control for country-specific effects, which cannot be done with country specific dummies due to the dynamic structure of the regression equation. Also, the estimates for β_0 (banking variables) can be biased due to various reasons: they may exhibit

measurement error, omitted variable bias or reverse causation. A suitable estimation method is therefore needed to obtain unbiased, efficient and consistent estimates.

Arellano and Bover's (1995) System GMM method makes it possible to take into account simultaneity bias and inverse causality by using the lagged dependant variables as instruments. The original GMM estimator (Arellano and Bond, 1991) yields inefficient estimates because lagged levels are poor instruments for first–difference equations. In contrast, the system GMM estimator eliminates this problem by using the lagged levels as instruments for first difference equations and the lagged first differences as instruments for level equations. More specifically, the two-step GMM is used instead of the one-step because the two-step is asymptotically more efficient.

The following regression equations are estimated to investigate the relationship between banking development and unemployment[51]:

$$uemp_i = \alpha + \beta_0 y_{it} + \beta_1 EFI_{it} + \beta_2 CV_{it} + \mu_i + \varepsilon_{it} \tag{16}$$

Estimated equation is given as follows:

$$uemp_i = \alpha + \beta_0 uemp_{i,t-1} + \beta_1 gdp_{i,t} + \beta_2 hhi_{i,t} + \beta_3 dctps_{i,t} + \beta_4 roa_{i,t} + \beta_5 \inf_{i,t} + \beta_6 RV_{i,t} + \mu_i + \varepsilon_{it}$$
(17)

Where $uemp_{it}$ is the unemployment in country i at time t. It is measured as the ratio of total unemployed to total labour force in each country. $EFI_{it,}$ is the efficiency indicators and CV_{it} are control variables also used in equation (15).

For this estimation the researcher employs the system GMM estimator developed by Arellano and Bower (1995), which combines a regression in differences with one in levels. Blundell and Bond (1998) stated evidence from a study in Monte Carlo that the inclusion of the level regression in the estimation reduces the potential bias in finite

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[51] Unemployment estimation ranges from 2002-2010. It has been limited to this number of years to obtain statistically satisfactory results, which explains why there are fewer number of observations

samples and the asymptotic inaccuracy associated with the difference estimator. The consistency of the GMM estimators depends on the validity of the instruments and the assumption that the error term is not serially correlated. The first test is the autoregressive test (AR) test, which examines the hypothesis that the error term is not serially correlated in both the difference regression and the system difference-level regression. The second test is either the Sargan or Hansen test of over-identifying restrictions which tests the overall validity of instruments by analysing the sample analog of the moment conditions used in the estimation process[52].To check the validity of instruments used in the estimation of the equations above, the researcher performed the Hansen test of over-identifying restrictions introduced by Arellano and Bond (1991) and Arellano and Bover (1995).

3.7 Estimation Results

3.7.1 Bank Development, Market Structure and Economic Growth

Table 3.1 presents the estimation results of equation (14). Models 1 to 6 are alternative specifications in which different control variables are used. In the first column, the banking level variables and market structure variable are reported and, subsequently, other macro and institutional variables are added to access any changes or improvements in the results. It is expected that there is a positive relationship between ROA and economic growth. If banks utilize their resources effectively and more investment opportunities are created, growth is supposed to increase. ROA is statically significant with a positive relationship as predicted. The variable DCTPS (domestic credit to private sector) also bears the expected sign in all regression and is statistically

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[52] The Hansen test is presented in these results because the Sargan test is not robust to heteroskedasticity or autocorrelation while the Hansen test, which is the minimized value of two-step GMM, is more robust.

significant. This suggests that an increase in banking credits to the private sector will effectively stimulate economic growth in Sub-Saharan Africa. Previous empirical studies have also shown that credit to the private sector is important for economic growth. See for example studies by Bencivenga, Smith and Starr (1996), Levine and Zervos (1998), and Beck and Levine (2001).

Bank concentration variable HHI enters with a positive sign for all models and is statistically significant. A highly concentrated banking sector may enhance growth due to its stronger resistance to financial crises, as larger banks tend to spread their activities geographically. High bank concentration can also take advantage of economies of scale in production of banking services (cost savings as a result of consolidating output of different banks).

Regarding other explanatory variables, INF (Inflation) has a negative and significant impact on economic growth. This is consistent with theoretical and empirical studies (see Barro, 1995 and Andres and Hernando, 1997). Trade is also introduced as a macroeconomic variable that can influence growth. It is negative and insignificant to economic growth. This finding contradicts earlier findings by Kessy (2008), who found a positive and significant link. The negative sign in the estimation could be as a result of most SSA countries importing more than they export, thereby reducing GDP growth. The majority of African economies are largely based on imported goods; this seriously impedes growth and therefore directly and indirectly eliminates incentives for manufacturers to grow their own local brands.

Rule of law, regulatory quality and government effectiveness appear to have no significant effect on economic growth. Rule of law proxies the extent to which investors are protected. If rule of law is efficient then banks will be willing to lend, and firms do not engage in agency problems or default in paying back loans taken if they know they can be forced into liquidation. In most African countries, rule of law is very weak with the maximum value being 1 against the national average of 2.5, according to World Bank Development Indicators. Estimating rule of law against bank efficiency variable ROA, this study finds a significant negative effect, indicating that the standard of a country's legal system substantially explains the level of financial development.

Lenders[53] should be able to have confidence that the legal system can quickly and transparently enforce their claims against a borrower, and outside investors should have easy access to quality, comprehensive and comparable information about firms. La Porta et al (1997) provide empirical evidence that financial systems are better developed in countries with a higher degree of investor protection. The estimated coefficient of Government Consumption is negative and statistically significant; this was expected, as high Government Consumption would affect the growth of the economy negatively.

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[53] Lenders can either be banks, finance houses or private individuals who would want to invest in properties or businesses.

Table 3. 1-Bank Efficiency, Market Structure and Economic Growth in SSA
- Dependent Variable - Annual Growth rate of GDP (1997-2010)

Variables	1	2	3	4	5	6
L.GGDP	0.440*	0.291*	0.329**	0.293***	0.252**	0.264**
	(0.244)	(0.162)	(0.164)	(0.103)	(0.116)	(0.107)
DCTPS	0.00588	0.0457	0.143*	0.280*	0.201*	0.172**
	(0.0480)	(0.0546)	(0.0852)	(0.145)	(0.118)	(0.0724)
ROA	0.0317***	0.0254***	0.0117*	0.0193**	0.0231**	0.0115
	(0.0121)	(0.00581)	(0.00687)	(0.00813)	(0.00987)	(0.00888)
HHI	2.291**	2.555**	2.778**	4.120*	4.263**	3.560***
	(1.009)	(1.020)	(1.172)	(2.288)	(2.013)	(1.332)
INF		-0.012***	-0.0099***	-0.0203**	-0.0189**	-0.00365
		(0.00358)	(0.00242)	(0.00826)	(0.00867)	(0.0148)
TRADE			-0.00726	-0.0112	-0.00789	0.00522
			(0.0143)	(0.0128)	(0.0118)	(0.0188)
RQ				-3.898	-1.584	
				(4.813)	(4.895)	
GE				-0.867	-0.968	
				(3.329)	(3.590)	
GOVT					-0.0770	-0.182*
					(0.109)	(0.0973)
Constant	0.941	0.953	0.246	-5.096	-1.653	1.231
	(1.626)	(1.353)	(1.951)	(4.498)	(3.749)	(1.660)
AR (1) P-value	0.078	0.078	0.036	0.024	0.059	0.046
AR (2) P-value	0.514	0.376	0.41	0.274	0.312	0.374
Hansen Test (P-value)	0.145	0.384	0.581	0.941	0.741	0.547
No of Observations	422	422	456	384	354	422

***, ** and * indicate statistical significance at 1%, 5% and 10%
Standard Errors are in parenthesis

Table 3.2 below shows similar results to estimations in Table 3.1. Spread[54] is included
in order to measure market power, which can also determine the level of
competition/concentration in the sector. High market power means concentration is
high and banks are less competitive. Spread is positive and significant in explaining
growth in the economy. This also supports the concentration variable HHI since the two
variables can be used interchangeably. Graddy and Kyle (1979) and Smirlock (1985)

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[54] The difference between the lending and the borrowing rate can also be used as efficiency indicator.
Koivu (2008), argues that spread is a good estimator for banking sector efficiency as it describes
transaction costs within the sector. If the margin reduces due to a decline in transaction costs, the share of
savings going to investment increases and as growth is positively linked to investment a decrease in the
transaction cost increases economic growth.

find that interest rate spreads are narrower in a concentrated banking system. Rajan and Peterson (1995) also find that firms are less credit constrained in more concentrated banking markets. In Table 3.3, HHI is excluded from the estimation in order to analyse any significant changes. All variables still enter with expected signs; Trade becomes significant indicating that international trade for Sub-Saharan countries is mainly dominated by imported goods. Government Consumption also negatively influences economic growth.

Table 3. 2- Bank Efficiency, Market Structure and Economic Growth in SSA
Estimation with Spread - Dependent Variable - Annual Growth rate of GDP (1997-2010)

VARIABLES	1	2	3	4	5	6
L.GGDP	0.503***	0.504***	0.221**	0.300***	0.243***	0.432***
	(0.0688)	(0.178)	(0.0937)	(0.102)	(0.0936)	(0.135)
DCTPS	0.108	0.137	0.127	0.336	0.310*	0.365*
	(0.0782)	(0.102)	(0.104)	(0.209)	(0.163)	(0.198)
ROA	0.0113**	0.0171	0.0158**	0.0227**	0.0272**	0.0140*
	(0.00512)	(0.0110)	(0.00650)	(0.00962)	(0.0126)	(0.00826)
HHI	1.489*	2.238**	2.375*	5.142	3.861	8.512**
	(0.800)	(1.012)	(1.364)	(3.710)	(3.199)	(4.197)
SPREAD	-0.00582	0.101***	0.0764**	0.0759*	0.0594	0.118
	(0.0110)	(0.0361)	(0.0362)	(0.0431)	(0.0449)	(0.0859)
INF		-0.035***	-0.031***	-0.043***	-0.040***	-0.0484*
		(0.00860)	(0.00920)	(0.0142)	(0.0133)	(0.0264)
TRADE			0.00852	-0.00444	-0.0130	0.0181
			(0.0167)	(0.0124)	(0.0173)	(0.0172)
RQ				-1.508	-4.839	11.25***
				(2.109)	(5.973)	(4.227)
RL				-4.280		-13.5***
				(3.101)		(5.153)
GE					-2.302	
					(5.622)	
GOVT						-0.00358
						(0.137)
Constant	0.0530	-1.958	-0.710	-8.212	-6.820	-11.32
	(1.427)	(2.767)	(2.780)	(7.080)	(6.121)	(7.715)
AR (1) P-value	0.087	0.108	0.039	0.038	0.037	0.080
AR (2) P-value	0.224	0.306	0.337	0.244	0.231	0.455
Hansen Test (P-value)	0.377	0.251	0.946	0.929	0.933	0.697
No of Observation	356	333	319	270	270	248

***, ** and * indicate statistical significance at 1%, 5% and 10%
Standard Errors are in parenthesis

Table 3. 3-Bank Efficiency, Market Structure and Economic Growth in SSA
- Dependent Variable - Annual Growth rate of GDP (HHI excluded) (1997-2010)

VARIABLES	1	2	3	4	5	6
L.GGDP	0.523***	0.522***	0.189**	0.205***	0.213***	0.118*
	(0.0751)	(0.175)	(0.0921)	(0.0732)	(0.0750)	(0.0667)
DCTPS	0.105	0.127	0.0993	0.234***	0.252***	0.0235
	(0.0679)	(0.0965)	(0.103)	(0.0832)	(0.0907)	(0.100)
ROA	0.00926*	0.0169**	0.0140**	0.0263***	0.0253***	0.0210***
	(0.00513)	(0.00813)	(0.00686)	(0.00430)	(0.00458)	(0.00635)
SPREAD	-0.00261	0.103***	0.0673**	0.0101	0.0114	0.0160
	(0.00991)	(0.0345)	(0.0342)	(0.0310)	(0.0308)	(0.0422)
INF		-0.035***	-0.027***	-0.0224**	-0.0230**	-0.0169
		(0.00816)	(0.00878)	(0.00881)	(0.0101)	(0.0128)
TRADE			0.01000	-0.0211*	-0.0180*	
			(0.0174)	(0.0124)	(0.0109)	
RL					-1.835	
					(1.779)	
RQ				-3.577*	-2.247	
				(2.095)	(1.671)	
GOVT				-0.0744	-0.0466	-0.160**
				(0.0837)	(0.0949)	(0.0776)
Constant	0.549	-0.970	0.921	0.545	-0.810	6.298***
	(1.225)	(2.451)	(2.290)	(2.306)	(3.100)	(2.324)
AR (1) P-value	0.806	0.104	0.027	0.042	0.042	0.054
AR (2) P-value	0.22	0.294	0.336	0.301	0.301	0.287
Hansen Test (P-value)	0.403	0.408	0.843	0.44	0.572	0.879
No of Observations	356	333	319	248	248	293

***, ** and * indicate statistical significance at 1%, 5% and 10%
Standard Errors are in parenthesis

Table 3. 4-Bank Efficiency, Market Structure and Economic Growth in SSA
*With Interaction term (HHI*DCTPS) Dependent Variable - Annual Growth rate of GDP (1997-2010)*

VARIABLES	1	2	3	4	5	6
L.GGDP	0.499**	0.376***	0.382***	0.306***	0.307***	0.308**
	(0.226)	(0.128)	(0.136)	(0.107)	(0.110)	(0.154)
DCTPS	0.196	0.318***	0.257**	0.325**	0.316**	0.183**
	(0.121)	(0.106)	(0.127)	(0.141)	(0.143)	(0.0722)
ROA	0.0203*	0.0174**	0.0151**	0.0240**	0.0232**	0.0161*
	(0.0107)	(0.00871)	(0.00637)	(0.0101)	(0.0116)	(0.00893)
HHI	7.733**	10.30***	9.808**	9.348	9.284	7.070**
	(3.250)	(3.975)	(3.876)	(6.085)	(6.045)	(3.051)
INF		-0.0067*	-0.00476	-0.0234	-0.0260	0.00189
		(0.00355)	(0.00630)	(0.0144)	(0.0164)	(0.00963)
TRADE		-0.00521	-0.00130	-0.0112	-0.0102	-0.01000
		(0.00796)	(0.00900)	(0.00808)	(0.00953)	(0.0166)
GE		-1.412	-2.175	-1.373		
		(1.120)	(3.274)	(2.136)		
RQ			1.359	-1.930	-2.041	
			(3.970)	(1.444)	(1.529)	
SPREAD				0.0477	0.0562	
				(0.0506)	(0.0559)	
RL					-0.961	
					(1.707)	
GOVT						-0.0323
						(0.0919)
HHI*DCTPS	-0.375	-0.41***	-0.377*	-0.383*	-0.378*	-0.285*
	(0.232)	(0.155)	(0.204)	(0.211)	(0.217)	(0.169)
Constant	-2.268	-4.854	-3.812	-5.216	-4.934	-0.0427
	(3.023)	(3.188)	(3.408)	(4.860)	(4.759)	(2.304)
AR (1) P-value	0.043	0.026	0.037	0.047	0.050	0.057
AR (2) P-value	0.58	0.281	0.256	0.218	0.225	0.422
Hansen Test (P-value)	0.473	0.53	0.409	0.348	0.339	0.235
No of Observations	422	384	384	270	270	422

***, ** and * indicate statistical significance at 1%, 5% and 10%
Standard Errors are in parenthesis

Table 3. 5-Bank Efficiency, Market Structure and Economic Growth in SSA
with Interaction term HROA - Dependent Variable - Annual Growth rate of GDP
(1997-2010)

VARIABLES	1	2	3	4	5
L.GGDP	0.433**	0.209**	0.205**	0.209***	0.235*
	(0.193)	(0.0874)	(0.0912)	(0.0685)	(0.135)
DCTPS	0.129*	0.207**	0.192**	0.185*	0.313**
	(0.0745)	(0.0928)	(0.0903)	(0.100)	(0.155)
ROA	0.00163	-0.00981	-0.00761	-0.00207	0.0158
	(0.00979)	(0.0149)	(0.0144)	(0.0117)	(0.0192)
HHI	1.825*	1.590	0.723	2.481	4.863**
	(1.040)	(2.831)	(2.843)	(2.458)	(2.374)
INF	-0.035***	-0.028**	-0.025**	-0.036***	-0.026***
	(0.00895)	(0.0135)	(0.0118)	(0.0115)	(0.00741)
SPREAD	0.0940***	0.0292	0.0220	0.0665	
	(0.0365)	(0.0449)	(0.0418)	(0.0412)	
TRADE		-0.00342	-0.0100	-0.00189	-0.0127
		(0.0126)	(0.0117)	(0.0102)	(0.0122)
RL		-3.957*	-1.946		-1.595
		(2.343)	(2.243)		(2.039)
RQ			-1.524	-1.061	-2.370
			(1.913)	(1.488)	(1.454)
GE				-2.984	
				(2.923)	
GOVT					-0.0988
					(0.103)
HHI*ROA	0.0327***	0.0512**	0.0481**	0.0458**	0.0185
	(0.0120)	(0.0238)	(0.0227)	(0.0206)	(0.0303)
Constant	-1.115	-2.482	-0.807	-2.996	-3.636
	(2.194)	(3.878)	(3.516)	(4.011)	(4.318)
AR (1) P-value	0.113	0.049	0.051	0.047	0.066
AR (2) P-value	0.337	0.186	0.199	0.175	0.339
Hansen Test (P-value)	0.272	0.303	0.235	0.617	0.682
No of Observations	333	270	270	270	354

***, ** and * indicate statistical significance at 1%, 5% and 10%
Standard Errors are in parenthesis

Table 3.4 above includes interaction terms (i.e. DCTPS*HHI) in order to examine the impact on economic growth[55]. The interaction between HHI and DCTPS is negative and significant. In other words development in the banking sector through increase in credit is good for growth but has less effect if it's combined with a high banking market concentration. The coefficient of HHI*ROA in Table 3.5 is positive and significant for all estimations except for Model 5, where the positive sign still remains but is insignificant. The result indicates that bank concentration coupled with efficiency in the banking sector improves economic growth. However, countries with high market concentration and a high ratio of investment going to the private sector will experience a decrease in growth. This may be due to high loan defaults or unprofitable investments by private individuals and firms. Both interaction terms are then added, results reported in Table 3.6 below, the results remain unchanged when both interaction terms are jointly controlled for; HHI*DCTPS and HHI*ROA retains their signs and significance.

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[55] Interaction terms between institutional variables and bank development were also tested but results were insignificant; therefore only the terms that are significant reported.

Table 3. 6 - Bank Efficiency, Market Structure and Economic Growth in SSA
Estimation with both Interaction terms - Dependent Variable - Annual Growth rate of GDP (1997-2010)

VARIABLES	1	2	3	4	5	6	7
L.GGDP	0.602***	0.121*	0.286**	0.464***	0.189*	0.244**	0.269***
	(0.188)	(0.0661)	(0.118)	(0.177)	(0.104)	(0.0972)	(0.0891)
DCTPS	0.108	0.201**	0.302***	0.224*	0.212*	0.276**	0.298**
	(0.0844)	(0.0978)	(0.0956)	(0.118)	(0.110)	(0.112)	(0.146)
ROA	0.101**	-0.00987	-0.00353	-0.00189	-0.0117	-0.0118	-0.0110
	(0.0433)	(0.0110)	(0.0112)	(0.00883)	(0.0101)	(0.0133)	(0.0113)
HHI	5.981**	6.286**	9.884**	6.935*	5.900	7.913	9.278*
	(2.665)	(3.002)	(4.062)	(3.753)	(3.730)	(6.045)	(5.383)
INF		-0.0069*	-0.010**	-0.03***	-0.024***	-0.0262*	-0.035***
		(0.00369)	(0.0046)	(0.00906)	(0.00815)	(0.0157)	(0.0131)
TRADE		0.00931	-0.00804		0.000197	-0.00920	-0.00339
		(0.0175)	(0.0085)		(0.0147)	(0.00917)	(0.00860)
RQ			-2.070			-2.061	-2.041*
			(1.322)			(1.388)	(1.147)
GE							-1.741
							(2.214)
RL						-1.181	
						(1.671)	
SPREAD				0.101***	0.0614**	0.0422	0.0778*
				(0.0370)	(0.0289)	(0.0487)	(0.0430)
HHI*DCTPS	-0.157	-0.363*	-0.44***	-0.302	-0.306	-0.330*	-0.376*
	(0.189)	(0.199)	(0.172)	(0.193)	(0.201)	(0.193)	(0.206)
HHI*ROA	-0.133*	0.045***	0.043**	0.043***	0.0544***	0.0638***	0.0689***
	(0.0755)	(0.0154)	(0.0187)	(0.0100)	(0.0142)	(0.0247)	(0.0199)
Constant	-2.301	-0.167	-3.691	-3.261	-0.449	-3.407	-5.402
	(1.957)	(2.078)	(2.903)	(2.989)	(2.762)	(4.106)	(4.642)
AR (1) P-value	0.024	0.015	0.038	0.126	0.050	0.057	0.051
AR (2) P-value	0.616	0.270	0.226	0.352	0.302	0.178	0.188
Hansen Test (P-value)	0.175	0.524	0.713	0.478	0.567	0.499	0.902
No of Observations	422	456	384	333	319	270	270

***, ** and * indicate statistical significance at 1%, 5% and 10%
Standard Errors are in parenthesis

3.7.2 Banking Sector Development and Unemployment

The effect of banking sector development on unemployment is reported in Table 3.6 below. Real GDP, which is annual growth rate, reduces unemployment. The sign is expected, as increased growth should mean more employment opportunities and job creation. Profit before Tax enters with both a positive and negative sign meaning higher profits in bank could lead either to increased unemployment or reduced unemployment. If higher profits cause increased growth, then unemployment is expected to reduce.

However, if higher profits have a negative effect on growth, it is also expected that this will affect unemployment adversely. Profit before tax is therefore an indirect link to unemployment rates. ROA is statistically significant, in these results, indicating a reduction in unemployment. The coefficient of Domestic Credit to private sector also shows a negative relationship with unemployment but is only significant in the last model. More loans issued out to the private sector can bring about job creation. Bank efficiency variables can affect the number of people either the banks or private firms employ.

Bank concentration variable exhibits a positive link to unemployment. It was expected that a high concentration would lead to more manpower being needed. The positive link may be as a result of a more capital-based approach to banking and less need for job creation. Also, mergers and acquisitions of banks can cause increased unemployment as workers are laid off. In Table 3.8, HHI was dropped and replaced with spread to test the robustness of bank concentration and unemployment. Spread enters with a positive relationship for all models except for model 5 and 6. Model 6 is the only statistically

significant relationship with unemployment. This result differs from what was obtained in Table 3.7. Spread which measures market power and also been used as measure of efficiency by some researchers shows a weak effect on reducing unemployment. The coefficient of spread in model 6 is very small. It is therefore assumed that HHI is a better measure of bank concentration and in Sub-Saharan Africa, high bank concentration increases unemployment.

Rule of Law and Regulatory Quality are both positive and insignificant. A weak system (rule of law) means banks' proxies are weak, which can cause mismanagement and misappropriation of resources. When this happens, both the banks and the private sector will not employ and can even lay off workers because of instability of the economy. Also, regulatory quality increases unemployment; therefore, a poor perception or ability of a government to provide for or promote the private sector will definitely impede job, growth causing more job losses in the system.

All the above results indicate that a developed financial system improves growth in the economy. The results also support this study's theory in Section 5: new innovations and ideas substitutes for old ones, thereby increasing efficiency of services in the industry. In effect, they lower cost of transactions and increase investment, which promotes growth. The P-values of Hansen Test, P-value of AR(1) and P-value of AR(2) tests are reported. In all instances, the P-values of Hansen test and AR(2) test are larger than 0.05, which indicates failure to reject the null hypothesis of over-identification and second order serial correlation of error terms; in other words, the specification tests support the validity of the instruments.

Table 3. 7-Bank Efficiency, Market Structure and Economic Growth in SSA
- Dependent Variable – Unemployment (1997-2010)

VARIABLES	1	2	3	4	5	6
L.UEMP	0.836***	0.991***	1.000***	1.004***	1.024***	0.895***
	(0.121)	(0.0412)	(0.0458)	(0.0356)	(0.0308)	(0.115)
GDP	-0.00059*	-0.000382	-0.000367	-0.000504	-0.00043*	-0.00064***
	(0.000304)	(0.000321)	(0.000319)	(0.000350)	(0.000242)	(0.000198)
DCTPS	-0.000047	-0.000035	-0.000032	-0.000040	-0.000055	-0.000084*
	(0.000045)	(0.000034)	(0.000034)	(0.000039)	(0.000052)	(0.000043)
ROA	-0.0265	-0.0639*	-0.0627*	-0.080***	-0.0937**	-0.0154
	(0.0683)	(0.0348)	(0.0364)	(0.0242)	(0.0370)	(0.00952)
PBT	0.000372	-0.000667	-0.000719	-0.000825		
	(0.00114)	(0.000638)	(0.000617)	(0.000687)		
HHI	0.00706*	0.00343	0.00412**	0.00388	0.00470**	0.00987***
	(0.00412)	(0.00215)	(0.00201)	(0.00312)	(0.00224)	(0.00288)
RQ	0.0171	0.00112	0.00245	0.00103		0.0155
	(0.0112)	(0.00399)	(0.00399)	(0.00252)		(0.0132)
RL	-0.00277	0.00211		0.00207		
	(0.00386)	(0.00190)		(0.00216)		
Trade	0.000099*	0.0000030	0.000029			0.000084
	(0.000052)	(0.000030)	(0.000034)			(0.000059)
Govt	0.000630					
	(0.000465)					
Spread						0.0000059
						(0.000034)
Constant	0.00866	0.0115*	0.0100	0.0148**	0.00146	0.0170
	(0.00902)	(0.00653)	(0.00728)	(0.00640)	(0.00257)	(0.0157)
AR (1) P-value	0.108	0.125	0.124	0.123	0.069	0.122
AR (2) P-value	0.590	0.574	0.579	0.571	0.568	0.694
Hansen Test (P-value)	0.891	0.620	0.549	0.650	0.370	0.956
No of Observations	187	187	187	187	210	147

***, ** and * indicate statistical significance at 1%, 5% and 10%
Standard Errors are in parenthesis

Table 3. 8-Bank Efficiency, Market Structure and Economic Growth in SSA
- *Dependent Variable – Unemployment (HHI not included)*

VARIABLES	1	2	3	4	5	6
L.UEMP	0.810***	0.993***	1.003***	1.011***	0.985***	0.921***
	(0.143)	(0.0438)	(0.0253)	(0.0368)	(0.0178)	(0.0313)
GDP	-0.0007***	-0.000590	-0.000493	-0.00067*	-0.000448	-0.00059**
	(0.000203)	(0.000368)	(0.000376)	(0.000332)	(0.000266)	(0.000223)
DCTPS	-0.000013	-0.000047	-0.000049	-0.000030	-0.000066**	0.000065*
	(0.000072)	(0.000038)	(0.000042)	(0.000041)	(0.000027)	(0.000038)
ROA	0.0572	-0.0591	-0.0640**	-0.0589**	-0.00823	
	(0.0869)	(0.0566)	(0.0304)	(0.0247)	(0.00948)	
PBT	-0.00105	-0.00148*	-0.00136*	-0.00109		-0.000584
	(0.000969)	(0.000814)	(0.000748)	(0.000700)		(0.000810)
RL	-0.00563	-0.000535			0.00378**	
	(0.00477)	(0.00478)			(0.00170)	
RQ	0.0237*	0.00618	0.00492	0.00235		
	(0.0125)	(0.00976)	(0.00335)	(0.00291)		
Spread	0.000019	0.0000074	0.0000094		-0.0000016	-0.00008***
	(0.000046)	(0.000032)	(0.000023)		(0.000010)	(0.000026)
Trade	0.00010	0.000016				0.000067*
	(0.000074)	(0.000055)				(0.000039)
Govt	0.000862					
	(0.000617)					
Constant	0.0256***	0.0247**	0.0228**	0.0178**	0.00920***	0.0140*
	(0.00865)	(0.0105)	(0.00988)	(0.00790)	(0.00167)	(0.00757)
AR (1) P-value	0.102	0.127	0.128	0.117	0.131	0.125
AR (2) P-value	0.564	0.601	0.591	0.574	0.618	0.607
Hansen Test (P-value)	0.972	0.618	0.61	0.442	0.748	0.964
No of Observations	130	130	130	187	135	148

***, ** and * indicate statistical significance at 1%, 5% and 10%
Standard Errors are in parenthesis

3.8 Conclusion

This study has explored the empirical linkages using a more advanced econometric technique- dynamic panel data estimation. The importance of this methodology is that it tries to solve the problem caused by unobserved country-specific effects and endogeneity of independent variables in lagged-dependent variable models. This chapter has had to contend with low quality data that is presently unavoidable in most developing countries especially Sub-Saharan Africa. Nonetheless, notwithstanding this limitation, it is hoped that the chapter has shed some light on a number of macroeconomic policy issues. The empirical findings provide some useful steps in understanding the link between banking sector efficiency, market structure and economic growth. In particular, the findings show that banking sector efficiency plays an independent role in promoting economic growth in Sub-Saharan Africa, supporting theoretical models that indicate qualitative financial sector development accelerates economic growth.

Another important finding of this study is that the structure of the sector can impact on growth positively. The governments of SSA countries can regulate how high or low they want the concentration of banks in order to get the maximum benefits of concentration positively affecting growth. Also, banks with strong market power seem to drive the economy positively. The implication of this is that governments should try and regulate the market power to achieve the best possible results. A low spread indicates efficiency which in turn promotes economic growth.

More reforms in the banking sector, especially in East and Central Africa, are needed to ensure quality of products and services is transmitted into increased growth. This should also be backed up with a strong legal environment. A strong rule of law means that banks are more inclined to invest, and private firms and individuals are confident about investing because they can get justice if one party defaults on the terms of agreement of the investment. Efficiency in the banking industry can also be improved by reinforcing technology, such as comprehensive computerization of the banking systems. This can help banks deliver products and services in larger volumes at competitive cost with better risk management practices.

In future research, it would be interesting to explore the direction of causality of bank development and economic growth in Sub-Saharan Africa. The direction in which causality runs has been somewhat unclear in past years. While some economists believe financial development leads to growth economic growth (see McKinnon, 1973; King and Levine, 1993; Neusser and Kugler, 1998; and Levine et al. 2000), some others believe economic growth leads to financial development (Gurley and Shaw, 1967; Goldsmith, 1969; and Jung, 1986). There are also economists who have suggested a bidirectional relationship due to country specific variables and use of data (see Arestis and Demetriades, 1997; and Demetriades and Hussein, 1996). It would also be interesting to test the effect of bank concentration and quality of institutions on economic growth, in particular if bank concentration and institutional quality matter for economic growth and if quality of institutions has an influence in shaping the relationship between bank concentration and economic growth.

CHAPTER 4: CONCLUSION

4.1 Introduction

This thesis presented a study in bank development, unemployment and economic growth using dynamic panel regression technique. The second chapter of the thesis focused on unemployment and economic growth in Sub-Saharan Africa, with particular reference to human capital accumulation for oil producing and non-oil producing countries in the region. The third chapter empirically examined the relationship between bank sector development and economic growth. Each of these empirical chapters has an embedded literature review and theoretical framework.   Although these areas are extensively researched, this thesis is the first to the researcher's knowledge to investigate the relationship using dynamic panel regression technique and by grouping the countries into oil and non-oil producing in Sub-Saharan Africa.

4.2 Overview and Findings

Economic growth is a major source of minimizing unemployment. The first empirical chapter tests this theory by using panel fixed effects and dynamic panel estimation technique. The result is that economic growth in the region can reduce unemployment. Also, human capital accumulation can significantly reduce unemployment but with greater effect on countries that are not oil exporters. Trade openness is also found to significantly reduce unemployment.   Domestic Credit issued is found to have no significant impact in reducing unemployment and Gross Investment's effect on unemployment is dependent on the state of the economy. However, using the dynamic panel technique, Domestic Credit increases unemployment in oil producing countries. This can be attributed to inefficient allocation of resources or loan default, or it could be

increase in physical capital for firms thereby reducing the need for human capital. Economic growth is found to reduce unemployment across all models. The key to reducing unemployment in Sub-Saharan Africa might be policies geared towards economic development and greater trade openness. The findings in this study are consistent with Hussain et al. (2010). They reported that sustained economic growth is the fundamental requirement to reduce unemployment and macroeconomic stability; investment oriented policies and political stability will be sources in which growth can increase.

The second chapter explores the effect of bank development and market structure on economic growth. The study utilises two main bank development indicators: Domestic Credit issued to the private sector (DCTPS), and Return on Assets (ROA).The study finds evidence in support of financial development enhancing growth in the region. This finding is consistent with Bencivenga (1991), Guidotti and Gregorio (1995) and Anderson (2003) where they find that bank development stimulates economic growth through efficient services in allocating resources. This further lends credence to the endogenous financial growth theory (Ang 2008). The findings of this study also suggest that concentration in the banking industry fuels economic growth in the region. As has been stated earlier, market concentration could either have a negative or positive impact on economic growth. Researchers have found different effects of concentration on the growth of an economy based on either the level of development, legal origin, or the particular sector of the economy.

4.3 Policy Implications

Sub-Saharan economies have inadequate economic policies and high corruption levels, which have caused the region great harm in terms of stagnant growth, underdevelopment of infrastructures, and high poverty rates. This thesis accesses the endogenous growth theory associated with the finance-led theory with the intention of analysing which theory best explains growth in the region. The region is working to bring together its economic policies, and also to establish institutions that serve all member countries. The West African Union, the French-speaking union and the African Union are few examples. The establishment of one currency for the whole of West Africa is also aimed at integrating the economies in order to foster growth.

This study highlights a regional framework that offers policy makers the opportunity of making an appropriate policy mix that can enhance financial development and economic growth. This study finds support for export oriented policies and the need to establish industrial zones not only in surrounding cities but also in remote areas, in order to reduce unemployment. Labour intensive policies must be adopted to reduce unemployment in rural and urban areas, more especially in rural areas. More efforts are also needed to improve human capital and develop infrastructure for rapid growth and to minimize unemployment.

Another basic finding in this study is that financial development increases growth. This study therefore suggests that human capital accumulation and financial sector development should be of great importance, as they are growth enhancing. Concentration in the markets increases growth; this can be improved by increasing the quality of information to which banks have access. The positive effect of concentration

could be as a result of easier access to information gathering, which helps banks to allocate credit to profitable projects.

Although this thesis suggests the importance of human capital and banking sector development in enhancing growth and reducing unemployment, it also recommends that appropriate attention should be given to institutional development and infrastructural development. Rule of Law and Regulatory Quality must also improve in order for banks to play their role effectively. Macroeconomic stability, credible political structures and removal of barriers to trade and finance must be in place if the region wants to compete within the global market.

4.4 Limitations and Suggestions for Further Research

The analysis in this thesis has been carried out using low quality data, as most African countries have little or no data for some economic indicators. The study adopts the panel data approach, which has been identified as having potential problems. These include the fact that the panel approach masks important cross-country differences and sometimes suffers from measurement statistical conceptual problems (Levine and Zervos, 1996). It is also suggested that it does not accurately account for country-specific issues, and that generalisations based on panel results may give incorrect inferences for several countries (Luintel et al., 2008). Therefore, it may be a useful exercise to carry out a country-specific study, in terms of unemployment and economic growth, and bank development and its effect on growth.

There are different aspects to the relationship between unemployment and economic growth. This thesis has focused on the direct relationship between the two. Other areas of research could explore the other aspects of this relationship. That is, how the exogenous changes of the type of growth can affect unemployment; how changes in labour marker institutions can affect the growth rate indirectly via changes in unemployment; and how changes in labour market institutions can affect both unemployment and growth directly but through different mechanisms.

This study has also only focused on banks in measuring financial development; further study could incorporate stock market development in enhancing growth, or stock market and banks in increasing economic growth in the region. Sub-Saharan economies are also characterised by informal financial sectors, such that the two sectors (Formal and Informal financial markets) are completely different in terms of regulations and development and their impact on growth. Further research could analyse the role of informal sectors in influencing growth in the region. The syndrome of "one size fits all" (Rioja 2004) does not apply for SSA countries, as their economies exhibit special characteristics. A further area of research may analyse the environmental factors, such as culture, value system, legal origin and political stability.
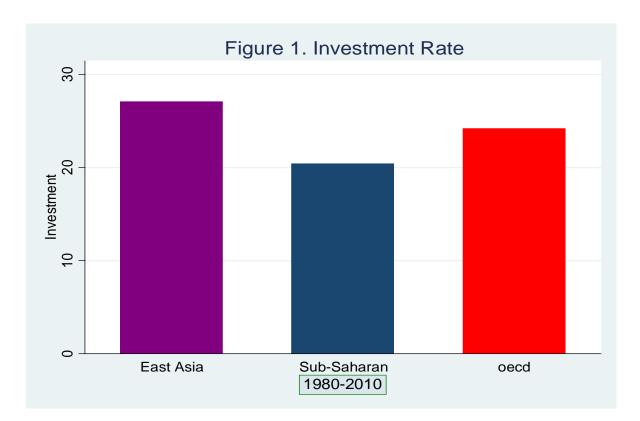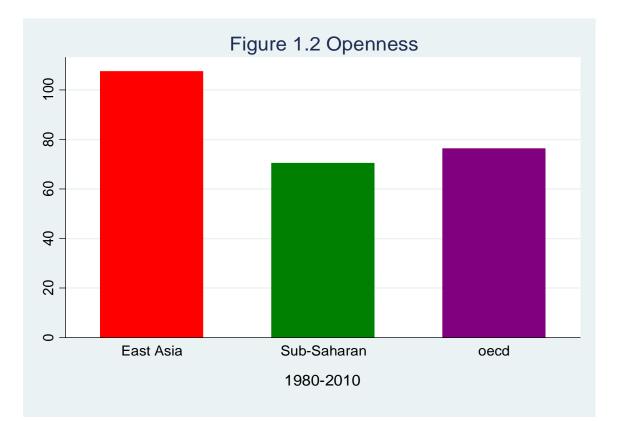
Appendices

Appendix - I

Figure 1

Figure 1. Investment Rate

Figure 2

Figure 1.2 Openness

Appendix A

Table A. 1 List of Countries

Benin	Gambia	Niger
Botswana	Ghana	Rwanda
Burkina Faso	Guinea	Senegal
Burundi	Kenya	Seychelles
Cameroon	Lesotho	Sierra Leone
Cape Verde	Liberia	Somalia
Central African Republic	Madagascar	South Africa
Chad	Malawi	Swaziland
Congo Republic	Mali	Tanzania
Cote d'Ivoire	Mauritania	Togo
Equatorial Guinea	Mauritius	Uganda
Eritrea	Mozambique	Zambia
Ethiopia	Namibia	
Gabon	Nigeria	

Table A. 2 Summary Statistics

Variables	Definition of Variables	Mean	Standard Deviation	Min	Max
UNEMP	Unemployment	10.96516	7.074056	2.267305	50.95541
GGDP	Growth rate of GDP	3.626649	7.807257	-51.0309	106.2798
GGDI	Gross Domestic Investment	20.60968	10.84303	-23.7626	113.5779
CREDIT	Domestic Credit % of GDP	19.04677	20.35683	1.542269	180.1687
EXP	Total Exports as a % of GDP	31.41185	20.81618	1.945799	136.3545
LITRATE	Literacy rate	55.3834	22.75737	12.22128	91.83646
TENR	Tertiary Enrolment	4.597467	5.238915	0.29135	31.03293
OPEN	Trade openness	73.70458	39.88125	6.32034	275.232

Table A. 3 Correlation Matrix

	UNEMP	GGDP	GGDI	CREDIT	EXP	LITRATE	TETENT	TRADE
UNEMP	1							
GGDP	-0.3478	1						
GGDI	0.2333	0.3707	1					
CREDIT	0.2784	-0.2468	0.077	1				
EXP	0.4354	0.1785	0.5746	0.1352	1			
LITRATE	0.6017	-0.2048	0.3623	0.4005	0.6142	1		
TETENT	-0.0074	0.0035	0.0377	0.1629	0.029	0.318	1	
TRADE	0.5835	0.0899	0.6433	0.1594	0.9492	0.6434	0.0076	1

Appendix B

Table B. 1 List of Countries

Angola	Ethiopia	Namibia
Benin	Gabion	Niger
Botswana	Gambia	Nigeria
Burkina Faso	Ghana	Rwanda
Burundi	Guinea-Bissau	Sao Tome
Cameroon	Guinea	Senegal
Cape Verde	Kenya	Seychelles
Central African		Sierra
Republic	Lesotho	Leone
Chad	Liberia	Sudan
Congo	Madagascar	Swaziland
Congo Democratic	Malawi	Tanzania
Cote d'Ivoire	Mali	Togo
Djibouti	Mauritania	Uganda
Equatorial Guinea	Mauritius	Zambia
Eritrea	Mozambique	Zimbabwe

Table B. 2 Foreign banks as a percentage of total banks by region.

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Eastern Africa	40	44	44	44	43	48	54	56	56
Northern Africa	22	22	26	29	29	29	34	34	37
Southern Africa	48	51	50	51	50	50	51	56	56
Western Africa	43	48	50	51	52	54	54	54	54

Source: Stijn Claessens et al., 2008, Foreign Bank Presence in Developing Countries 1995–2006: Data and Trends, IMF Working Paper.

Table B. 3 Summary Statistics

Variable	Definition of Variables	Source	Mean	Standard Deviation	Min	Max
GDPG	GDP growth rate	WDI	4.868407	6.681177	-31.3	71.188
UEMP	Unemployment -Total employed/Total Labour Force	WDI	9.554399	7.822313	-0.79872	50.19815
ROA	Return on Asset	Bankscope (Net Income/Total Asset)	11.8531	29.48779	-329.15	203.41
DCTPS	Domestic Credit to private sector	WDI	16.39838	13.74453	0.682795	87.8116
HHI	HHI Index – totalasset/totalbankingasset	Bankscope	0.406843	0.281359	0	1
RL	Rule of Law	WGI	-0.69385	0.642561	-2.08585	1.02325
RQ	Regulatory Quality	WGI	-0.67466	0.5667	-2.26178	0.846824
GE	Government effectiveness	WGI	-0.74278	0.555325	-1.98199	0.766286
SPREAD	SPREAD	WDI	14.3449	19.77904	0.525	293.083
TRADE	Exports & Imports (% of GDP)	WDI	81.0262	41.98682	17.8586	275.232
GOVT	Government Consumption expenditure	WDI	15.43415	8.494611	2.2877	69.5428

*WDI – World Development Indicators

*WGI – World Governance Indicators

Table B. 4- Correlation Coefficient

	GGDP	UNEMP	DCTPS	ROA	HHI	INF	TRADE
GGDP	1						
UNEMP	-0.1214	1					
DCTPS	-0.0977	0.1736	1				
ROA	0.0368	0.1135	0.1592	1			
HHI	0.0149	0.0063	-0.1183	-0.2056	1		
INF	-0.1986	-0.0947	0.1633	0.0048	0.1485	1	
TRADE	0.2335	0.2432	0.1469	-0.0806	-0.133	-0.0231	1
RL	0.0273	0.464	0.5933	0.2011	0.014	-0.183	0.1577
RQ	-0.0203	0.515	0.4476	0.3381	-0.0953	-0.279	-0.025
GE	-0.0056	0.4959	0.6484	0.2248	-0.025	-0.0948	0.033
GOVT	-0.0914	0.5335	0.2675	0.05	0.0763	-0.0429	0.3388
SPREAD	-0.1742	-0.1608	0.0429	-0.2069	0.1646	0.9136	-0.04

Table B. 5- Correlation Coefficient

	RL	RQ	GE	GOVT	SPREAD
RL	1				
RQ	0.8345	1			
GE	0.9097	0.8488	1		
GOVT	0.4469	0.3317	0.4615	1	
SPREAD	-0.2449	-0.3367	-0.1738	-0.0908	1

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