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for tomorrow

PROFESSORIAL INAUGURAL LECTURE

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Topic:

"Resource nationalism: A threat or a panacea to economic development?"

RESOURCE NATIONALISM:
A THREAT OR A PANACEA TO ECONOMIC DEVELOPMENT?

1. INTRODUCTION

Mr Vice-Chancellor, Deputy Vice-Chancellors, the Dean of the Faculty of Business and Economic Science, invited guest, colleagues and friends; I am very honoured for the privilege to give this inaugural lecture. My relationship with NMMU has been a fruitful one and I would like to thank all those who have contributed in one way or the other to my success.

The natural resource endowments, which attracted the colonialists to Africa many centuries ago still constitute the mainstay of most if not all economies on the continent. It is therefore uncommon to hear people in Africa whether in Accra, Kinshasa or Johannesburg talk about the irony of being poor despite our immense mineral wealth. The continent's unhealthy dependence on natural resource exports for economic growth has been studied extensively over the last five decades. My own PhD and post-doctoral research work makes a modest contribution to the literature from several perspectives (Ocran, 2007). In order to underscore the central role played by natural resource exports and economic growth in Sub Saharan Africa let's consider some statistics. About half of all countries on the continent derive 60 percent or more of their foreign exchange inflows from just three commodities. Indeed in some instances the source of 90 percent or more of the inflows is from a single commodity such as the case of Nigeria and Angola for oil and Tobacco for Malawi. Even in South Africa where the economy is relatively more diversified the role of the mineral-energy complex in determining the fortunes of the economy cannot be overemphasised. It is against this background that the recent call for nationalisation as policy option for development from a section of the political class offers an opportunity for economists, particularly those of us in academia, to contribute to the debate from a dispassionate and informed perspective.

I seek to achieve three objectives in my lecture: first I attempt an outline of the evolution of economic thought regarding progress from the medieval period to contemporary times. Following the discussion of the mainstream theories of economic growth I then review the associated empirical literature. I also consider a brief case study on two successful countries before addressing the question whether resource nationalism matter in determining economic development. Lastly, I provide some policy recommendations for economic development in South Africa and other resource rich countries on the continent.

On the onset I would want to define economic development as the sustained increase in per capita income over the long-term. And here, long-term is considered as a period of 25 years or more. While I admit that there is considerable debate as to what constitutes economic development since there are a number of competing definitions out there, growth in income cannot be excluded from even the heterodox definitions. Nonetheless, in the body of literature on mainstream economics long term growth in per-capita income suffices as adequate definition of economic development.

2. THEORIES OF ECONOMIC GROWTH

Economic thinking regarding the improvement of material well-being of people has evolved over time. Generally, economic historians group the literature on economic thought into four main strands: the pre-classical view, classical, neoclassical and modern economics.

In order to put my discussion in a proper context as far as theories reading economic development is concerned I would attempt to outline the history of economic thought over the years. This will serve as a good backdrop to the thrust of this lecture. I will do so by providing the key highlights of the various schools of thought regarding economics in general and where possible the associated growth theory. It must be said though, that the pre-classical era can't be associated with any systematic economic theory that purport to explain long-term growth in income per capita. Nonetheless, Adam Smith and his contemporaries as well as those who came after him, draws on the ills and flaws of the pre-classical economic thinking in fashioning out their arguments and theories of development. Thus, Adam Smith's work "*The Wealth of Nations*" marked the beginning of an attempt to provide an organized and cogent body of work aimed at explaining and providing policy prescriptions for economic management in general as well economic development.

3.1 The Pre-Classical Era

The pre-classical era as far as the history of economic thought is concerned may be considered as the period before the 18th century. Two main schools can be identified in the literature regarding the pre-classical era: the manorial system which was associated with the feudal political system in the medieval times across many communities in the world and the mercantilist school of economic thought.

The earliest body of economic thought regarding the improvement of the well-being of the nation state is a little difficult to pin down. Nonetheless, the feudal system, whose origin is debatable in the literature is generally agreed to have predated the mercantilism system of economic thinking. While a group of scholars argues that the system reigned between the 5th and 15th century others suggest that feudalism was the norm from the 7th to the 10th century. The feudal economic system was characterised with rudimentary mode of production and subsistence. The driver of the feudal system was not profit but survival. In Europe, the manor or village aimed at self-sufficiency and trade was reduced to a minimum if at all there was trade. Various societies including that of Africa were also organised around the feudal system.

A survey by Coulbourn (1956) considered a comparison of feudalism in Japan, China, Ancient Egypt, India and the Byzantine Empire as well as Russia. There is also ample evidence of feudalism in Africa, South of the Sahara. For instance, Roscoe (1911) discusses the feudal system in Buganda (found in present day Uganda), Rattray (1924) throws light on the feudal system practised by the Ashanti (in Ghana), and Nadel (1942) documents the system as seen in Nupe, northern Nigeria. *Ruanda*'s (present day Rwanda) feudal system is also well documented. It is therefore not difficult to reach the conclusion that the feudal system was not only a medieval European phenomenon but rather a universal stage in man's economic history.

This is a view that is strongly supported by Itandala (1986) after reviewing feudalism in pre-colonial East African nation states.

The decline of European feudalism and feudalism elsewhere may be attributed to a variety of reasons. The commercialisation of agricultural activity as a result of the improvement in technology- gun powder, mechanical power, improvements in navigation etc, the introduction of money in the economy and decline in barter encouraged people to work for money. These and many other country specific causes together worked to weaken the grip of the feudal system.

According to Habey (1936) Professor Hecksher provides an apt review of mercantilism. A number of scholars provided the intellectual basis for mercantilism: Niccolo Mechaiavelli (1469-1527) whose work is associated with rise of the nation state. Jean Bodin (1530-1596) believed in the supreme power of the state and natural law and was a great advocate of mercantilist policy of trade. Antonio Serra (1580-1650) a contemporary published "A Treatise of the causes which make gold and silver abound in kingdoms where there are no mines". Serra's work was the first systematic scholarly development of mercantilism as an economic theory.

Mercantilism became the dominant economic thought following the end of the European feudalism at the latter part of the middle ages. Unification of the state was the first pillar of the mercantilist economic thought. Prior to mercantilism the concept of the state was ill defined. Indeed there existed communities with no central authority other than the local lords. Mercantilism therefore sought to ensure the emergence of a unitary state. As part of this policy objective it was required that the state take steps to ensure the removal of customs barriers, currency systems and regulation of industrial activity, uniformity of systems and weights within its confines.

The second imperative of the system was to increase the power of the state after unification. In this direction all economic activity was subjected to the power of the state. The power of the state was to be effected through efforts aimed at increasing the national income through taxation. The supply of strategic goods and services deemed essential for maintaining the power of the state such as: ships, sailors and important raw materials was to be safeguarded.

And thirdly, the wealth and power of the state was to be fostered through the protection of domestic industry and the management of monopoly rights. Governments were encouraged to pursue policies aimed at protecting domestic producers from foreign competition and by that promoting the wealth and the power of the state through the creation of monopolies to provide government with a stream of income. With your permission I would want to quote from Ekeland and Tollison (1981) who describes the motivations for mercantilism.

> "the supply and demand for monopoly rights through the machinery of the state is the essence of mercantilism.. the state found it efficient to seek revenues by the selling of the monopolies and cartel privileges" (Ekeland and Tollison, 1981).

The management and creation of monopolies by the mercantilists was of great benefits to government. The monopolies were able to accumulate large amounts of profits and these were taxed by the state. The other benefits that government got from the monopolists included

loans, which were most times not repaid, and of course bribes. At the same time attempts were made to increase exports and limit imports because there was concern that domestic production may not be totally absorbed by the domestic market. It was through increased production that jobs might be created and therefore reducing unemployment, it was understood. The management of demand and supply of monopoly rights through the agency of state machinery was perhaps one singular hallmark of mercantilism that worked against the masses and indeed economic progress. As part of the monopoly systems cartel privileges were linked to the guilds. The guilds were trade associations of artisans that controlled or regulated the practices of their trade in a particular town. There were merchant guilds and other trade guilds. The guilds controlled trade in all sorts of areas such as leather tanning, soap making, dyes, printed books, etc.

Hecksher (1935) argued that that indeed the Colbert's mercantile policy was for all intents and purposes an indirect taxation. This was attained by taxing consumers through the monopolistic artisans. The monopolies were very useful to the state because income that is taken away from the household could be levied at a higher rate of taxation than if it had been in the hands of the household. The collection of tax was therefore much easier with the monopolies compared with the effort to collect taxes from households. During the time of Colbert (1662 – 1683), the French finance minister, the French state is reckoned to have obtained as much as 50% of its revenue from monopolies and cartel rights. McDermott (1999) again points out that the only legal international trade conducted by Spain's North American colonies at the end of the 17th Century was through the huge flotillas organised by wealthy trading houses of Seville and Cadiz in Spain with the overt approval of the Spanish Crown. The English East Indian and the Hudson Bay companies that had exclusive rights from the English Crown and the Dutch East Indian Company chartered by the Dutch state are all examples of leading monopolies in that era. For example, the colonial history of South Africa is intrinsically linked with the Dutch East Indian Company. Indeed, the idea of colonisation was a mercantilist policy prescription as a way of accumulating wealth for the mother country.

Later on in the 17th Century the ills of mercantilism became obvious. David Hume, an English economist was against mercantilism as were so many others. And he highlighted the flaws of the assumptions underlying mercantilism in his essays. Mercantilism was reckoned to reduce the growth potential of countries and ultimately, the welfare of the population.

2.2 Classical economics

The term classical economics is attributed to Karl Marx (1847) who used the term to describe David Ricardo's formal economics. Marx's view was that the propositions suggested by Ricardo had a flavour of romanticism because it was a type of economics which was *closer to the people*. Generally, the term has been associated with economic thought pertaining to the period 1776 to 1870. Adam Smith's work, "An Enquiry into the Nature and Wealth of Nations" (1776) marks the formal birth of classical economics. However, before Smith's time various authors had criticised the then orthodoxy, mercantilism.

The leading economist of the 18th and 19th centuries, the period within which the classical school dominated economic thought have come to be known as those who vigorously campaigned against the perceived flaws of mercantilism. For example David Ricardo argued strongly against the Corn Laws in England, Thomas Malthus was concerned with unrestrained population growth and Adam Smith was a fervent critic of the monopoly privileges bestowed on some by mercantilism (Harris, nd).

It's been argued in the literature that the classical school of economics was able to dominate economic thinking for a relatively longer period of time because of two key claims by the adherents. First, poverty and misery were thought to be necessary evil and a consequence of capital accumulation which is a requirement for wealth creation. The second was the view that free and unencumbered market economy was essentially an extension of a natural law (Sweeney, 1977).

Classical economics have certain core assumptions that have been developed systematically over the years. It is also important to underscore the fact that the idea of classical economics didn't begin or end with Adam Smith, the great Scottish thinker. Hume, Petty and the physiocrats[1] from France had criticised the earlier dominant view – mercantilism. Smith's most popular work is however, recognised in the literature as the point of departure in the formalisation of an alternative thought concerned with an attempt to explain the material well-being of people at the time.

The important assumptions underpinning the classical school included the notion that prices ought to be flexible an idea often associated with Adam Smith's suggestion of an "invisible hand". Another important assumption associated with the classical theory of economics is the Say's law, which suggest that supply creates its own demand to that extent that the economy generates adequate income to purchase all output at all times. The other key assumption of the classical school is the savings-investment equality, meaning, savings by the household sector generates adequate resources to cover investment expenditures by the business sector on capital goods.

The Classical Growth Theory

It is within the classical theory that classical growth theory (CGT) resides. The CGT argues that real GDP growth is a transitory phenomenon and that a rise in real GDP per capita over the subsistence level will lead to a surge in population which will ultimately cause real GDP per capita to move back to the subsistence level. It is on the basis of this gloomy prediction that economics (or political economy as it was then called) was characterised as the "dismal science" by Thomas Caryle, a Scottish historian and essayist in the 19th century.

The thrust of the CGT was that there existed a certain level of minimum wage rate required to sustain life. And this wage rate was described as the subsistence wage rate. Now, improvement in technology results in investment in new capital. Labour productivity increases as result of new investment which then causes the real wage to move beyond the subsistence level which eventually leads to population increase. We then have an increase in the supply of

[1] A school of economic thought founded in France in the 18th century that held the view that government policy should not interfere with the working of natural economic laws and that land was the source of all wealth.

labour from the population increase and an ultimate downward pressure on the real wage. It was thought that the population continues to rise until the supply of labour pulls down real wages back to the subsistence level. When the real wage reverts to the subsistence level both increases in population and economic growth (real per GDP person) ceases.

The classical growth theory was thus largely premised on the Malthusian population dynamics theory among others. We can dismiss the above explanation of economic growth because there is ample historical evidence that runs contrary to the assertion. Indeed, we know that population growth is not closely associated with real GDP per capita and population growth does not cause income to move back to subsistence level. Karl Marx is reported to have rejected the idea when it was proposed. Marx pointed out some of the flaws in the classical analysis of the political economy as a whole and expressed misgiving regarding the analysis of the capital accumulation process which was a lynchpin of the growth theory then. Again it is argued, for instance, in Harris (nd) that the classical growth theory grossly underestimated the nature of technological progress as an enduring force for continuously transforming productivity in agriculture and industry. Harris further suggests that even though the classical growth theorists noted the importance of international trade and foreign investment their formal explanation of economic growth failed to account for these components in the analysis.

2.3 Neo-classical school economics

The expression neo-classical economics (NCE) is attributed to Thorsten Veblen (Lawson, 2013). The neo-classical school of economics was developed between the end of the 19th century and the beginning of the 20th century in Europe. Like all the major schools of thought, neoclassical economics describes a range of theories associated with policy stances in economics. Neoclassical economics constitute the mainstream of economic thought in contemporary times and it shows no sign of imminent rejection. Nonetheless, the neo-classical school of economics has a number of variants. Based on the definition of the bounds of the school others may include Keynes, the monetarist school, the Austrian school etc. However, broadly speaking the neo-classical school of economics can be characterised with a number of assumptions and precepts.

While the provision of a precise definition of neo-classical economics is a challenge due to the eclectic nature of the constituent schools of thought it is not impossible to identify the major principles and assumptions that are associated with it. Again, one can argue, quite safely that neo-classical economics is concerned with the explanation of the equilibrium that pertains in the market for goods and services mediated by prices when demand and supply are in balance (Salomon, 2014). The key principles and assumptions underpinning neo-classical economics include but not limited to: scarcity, utility maximisation, profit maximisation; marginal analysis (of costs, revenues, utility, productivity, etc), market equilibrium, perfect competition and factors of production. The main contributors to the neo-classical school include: Leon Walras (1834 -1910), Alfred Marshall (1842-1924) and Vilfredo Pareto (1848-1923) amongst others.

These concepts account for the reconfiguration of the classical view of economics into a more analytical social science. These quantitative constructs often associated with NCE intend fed into the development of mathematical economics and econometrics which together reinforced the classical rigour and helped do away with some of the flawed prepositions of the classical school. Others have critised the NCE as having mathematicised economics using classical physics etc. (Arnsperger and Varoufakis, 2005; Reinert, 2012 and Colander, 2000). While Colander, a historian of economic thought, does not dispute the contents of the NCE school of thought he is of the view that the term does not appropriately describe the school of thought. More so since NCE is sometimes used to describe modern economics by others; it is also known that it is often used as a slur to denigrate heterodox economists. Paul Krugman, the Nobel laureate and Keen in banter denigrated each other by calling the other a neoclassical economist (See Krugman, 2009 and Keen, 2012). It is on this basis that others argue strongly about the use of the term and advocates for the use of "modern economics" to characterise the NCE School. Anyway, while people have issues with the term, I would rather not join that debate because it's inconsequential regarding the purpose of the present lecture.

More importantly, while the NCE School dismisses some of the concepts associated with the classical school it builds on most of them. For instance, NCE adherents argue that Ricardo, a leading theorist of the classical school, was wrong to suggest that profit is a residual of social product; the NCE school rather argue that profit is determined by the level of marginal productivity of capital and wages by the marginal productivity of labour. According to the NCE school, if labour forces the hand of employers to extract wages greater than the marginal productivity of labour the consequence will be job losses. It is therefore not surprising that after the recent protracted industrial action in the mining sector in South Africa there is talk about retrenchments in the industry. Following Vilfredo Pareto's argument, wages greater than marginal productivity of labour is expected to breed economic inefficiency. In a similar vein, if the cost of capital is greater than the marginal productivity of capital we have inefficiency in the capital market. Thus, in general, the correct valuation of each factor of production should be determined by its marginal productivity.

Closely associated with neo-classical economics are a number of theories that emerged in the 20th century and particularly after the Second World War to explain why certain countries were experiencing faster economic growth while others were falling behind.

Neo-classical Growth Theory

The neo-classical growth theory (NGT) unlike the classical growth theory provides some optimism regarding economic growth prospects. The Solow Growth Model represents the primary articulation of neo-classical economics representation of a theory on growth. The pre-eminent place of Prof Solow's growth model accounted for his award of the Nobel Prize in Economics in 1987. Solow's 1956 paper makes a number of assumptions. Solow suggested that economies have a tendency to move to a steady state – state equilibrium. Permanent growth is possible if there is continuous improvement in technological progress. Growth per capita output occurs when an economy moves from one steady state to the other. An increase in the rate of saving or decrease in population growth were factors that could propel an economy to a higher steady state. Higher permanent income growth was attainable when there is an increase in the rate of labour-enhancing technological progress (Solow 1956).

Formally, the Solow growth model assumes the rates of population growth, savings and technological change as exogenous. It assumes further that there are only two inputs, capital and labour. And these inputs are paid their marginal products (Solow 1956, Mankiw, Romer and Weil, 1992). One other important assumption is that there is a decreasing return to capital when a Cobb-Douglas production function is assumed.

In recent time economists have found the Solow growth model and its variants defective, as they argue, the model fails to account adequately for differences in income among countries (Romer, 1987, 1987a) and Lucas (1988). Mankiw, Romer and Weil (1992) among many others suggest that there is still something to be said about the usefulness of the Solow growth model. Interestingly, even supporters of the model such as Mankiw and others (Mankiw, Romer and Weil, 1992) deem the model incomplete because it fails to explain the drivers of saving, population growth and technological change which are all very important factors in the growth process. The neoclassical growth model treats these important determinants of growth as exogenous. Thus while recognising the importance of these variables it proves helpless in explaining them in the model.

2.4 Modern Economics

Before reviewing the current generation of models used to explain economic growth I would want to provide a brief sketch of the trajectory that has been assumed by modern economics. This is to help situate the new theoretical growth models and recent empirical work aimed at explaining economic growth. As has been clearly articulated in Colander (2000) what defines modern economics is no longer content but method. What do I mean by method? We can get an answer from Robert Solow,

> "today if you ask a mainstream economist a question about almost any aspect of economic life, the response will be: supposed we model that situation and see what happens... there are thousands of examples; the point is that modern mainstream economics consist of little else but examples of this process (Solow1997, p43).

A notable expert on the history of economic thought conclude that modern economics is more open to varying methodologies and uses more technical tools in more creative ways (Colander 2000). In the same breath Colander argues that it still has its flaws and has a long way to go. It is within this setting that a range of models have been developed to improve on the neo-classical growth models. A common thread that runs through all the new models is the reliance on microeconomic concepts of formalisation and the use of mathematical concepts to cast the models.

One of the perceived weaknesses of the neoclassical growth theory, perhaps the main flaw, is that while it recognises technological change as the key driver of long-term economic growth in per-capita income yet it sees technological progress as exogenous. Thus Solow assumes that technological change is explained by technical forces completely outside the domain of economic forces. The new growth models challenges this view by suggesting channels through which technical change is influenced by economic forces. Again, associated with the neo-classical view of capital is the concept of diminishing marginal returns to capital. On the

contrary, proponents of the new growth theories are of the view that we can actually have an increasing return to capital or at worse constant returns to capital. Nonetheless, the new growth theories do not necessarily dismiss the neoclassical attempts at explaining why some countries grow faster and or grow consistently over a long period of time while others falter; it improves upon the neoclassical growth theory.

Endogenous growth models

As point of departure, the new growth models unlike the neoclassical counterpart assume increasing or constant returns to capital. More importantly, they endogenises technological progress, in other words, they explain the channels through which technological progress effect changes in per capita income. The seminal papers by Romer (1986) and Lucas (1988) unravels the black box of "technological change" that Solow identifies as the key driver of long-term growth but is unable to unpack. The neoclassical model by construction reduces the scope for public policy in influencing sustained increases in per-capita income. Another characteristic feature of the endogenous growth theory is that government has a terribly important role in fostering continuous growth in per-capita income through its policy choices. Second, the economic decisions made by economic agents such as households and firms also play a critical role in generating increases in per-capita income over the long-run. Whilst a number of different versions of the endogenous growth models exist in the literature generally we may group them into two main classes (see Jones, 1995).

The first generation models are often called the "AK" models and the second group the R&D based models. The AK type of models is attributed to Romer (1986 and 1987), Lucas (1988) and Rebelo (1991). The AK models identifies a number of channels through which technological improvements facilitates sustained growth in per-capita income. These models suggest that technological progress occurs through the accumulation of human and knowledge capital. The channels for the accumulation of human and knowledge[2] capital include: formal education, on-the-job training, learning-by-doing[3], basic scientific research, process innovations and product innovations (see Aghion and Howit, 1992).

Romer (1986) dwells on the basic form of capital, knowledge, in discussing the *endogenisation* of technology in the aggregate production function. Romer then argues that long-run growth is largely accounted for by the accumulation of knowledge by forward-thinking profit-maximising economic agents. He assumes that the production of new knowledge by one firm generates positive externalities for the production possibilities of other firms because private knowledge cannot be kept secret for long. Think about the pioneering role of IBM in the manufacture of personal computers and the large of number of manufacturers of personal computers that we have today. Almost every invention gets to be replicated elsewhere over time despite the existence of patents this happens because private knowledge eventually becomes public knowledge. This version of the new growth model suggest that the production

[2] Mankiw (1995) has aptly defined "knowledge" as the summation of technological advances and scientific innovations as captured in textbooks, academic journals, the internet and etc while "human capital" is given as the stock of knowledge that has been passed on from those sources into the brains of human beings through learning.
[3] Acquisition of new skills as a by-product of work.

function of consumption goods is dependent on the stock of knowledge and the other inputs and is associated with increasing marginal product.

The human capital accumulation model of Lucas (1988) suggests that all that is required for sustained long-term growth is the incentive to stimulate investment in human capital. That's the production of human capital which has a constant returns to human capital is assumed so that marginal product is rendered constant. He suggests that accumulation of human capital has the tendency to enhance productivity of the economy and consequently economic growth. The premise for this view is related to the spill-over effect of human capital accumulation by arguing that individual workers are productive no matter their own skill levels as long they work with individuals endowed with higher levels of human capital. Lucas further argues that part of an individual workers' time is spent on accumulation of skills. Therefore investments that facilitate human capital formation enhance economic growth. The proponents of the human capital accumulation as the most important channel of technological change also provide an alternative version of the human capital accumulation model which looks beyond formal education. This version assumes that human capital accumulation may arise through on-the-job training and learning by doing.

The "AK" models are found wanting when it comes to why certain European countries haven't seen equally high increases in per-capita incomes after the 1950s. More so when the data suggest that some European countries have recorded sustained increases in investments, trade openness, average years of schooling and many other important variables suggested by the AK model as drivers of long-term growth in per-capita income. This experiential failure of the AK model partly accounts for the new focus on the R&D models. The seminal papers of the R&D literature include Romer (1990), Grossman and Helpman (1991a and 1991b) and Aghion and Howit (1992).

The basic form of the R&D version of the endogenous growth theories essentially models the innovation process explicitly. The model suggests that growth is exclusively due to technological advancement, which also emanates from competition among research entities to generate innovations. Each innovation produces a new intermediate good that may be used as an input to produce a final good in a more efficient way than before. The incentive for innovation is drawn from the monopoly rents that flow from the acquisition of patent rights to successful innovations. In the fullness of time those rents are destroyed by the next innovation, which makes the existing innovation obsolete. The process of repeated productivity enhancing innovations constitutes the source of long-term growth. Also assumed here is that the search for innovations is by profit maximising individuals and firms. Consequently, the aggregate labour in the production function is split into two. There is labour for the production of output and labour committed to searching for new innovation. The thrust of the R&D models is that the labour associated with the creation of innovation drives knowledge creation.

The contribution of R&D to long-term growth in per-capita income is the ability of R&D investments to generate spillovers from aggregate stock of knowledge. It is also assumed that an increase in the stock of knowledge through R&D ultimately reduces the cost of R&D. Under favourable conditions spillovers from R&D will produce constant returns to investments in R&D

resulting in a virtuous cycle as firms continue to invest constant amount of resources in R&D and thus increasing the stock of knowledge at a constant rate. In essence the innovation-based endogenous growth theory suggest that the best way to generate sustainable long-term growth is not about increasing investment/savings but rather allocating a larger portion of output to R&D. The contribution of Aghion and Howit (1992) to the R&D model draws on the earlier work of Schumpeter, who highlighted the critical role of innovations to economic growth and I quote if I may,

> "The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets...(this process) incessantly revolutionises the economic structure from within, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism". (Schumpeter 1942, p83 as quoted in Aghion and Howit, 1992).

A notable prediction of the AK models is that a permanent increase in investment in turn generates permanent increases in growth. In the context of the AK theory therefore, the long-term growth prospects of an economy is determined by its savings/investment rate. Consequently, an increase in the saving/investment rate will generate long-term growth. However, some studies such as Jones (1995) among others shows that growth in investments in the long-run do not necessarily results in corresponding long-term increases in economic growth as seen in the OECD countries. The model also suggests divergence in differences in long-term growth in income per capita among countries, meaning, for any two countries with different levels of initial income the absolute gap between them increases with time. The model explains the linear relationship between output and capital by defining capital broadly to include both physical and human capital. Capital under the endogenous growth model also includes knowledge capital. Again, it also assumed here that there is positive knowledge spill-over effects. Technological progress is reckoned to have the ability to act as a countervailing force to the possibility of decreasing marginal product of capital.

Following the review of the evolution of the growth theories, I would want to submit that the growth models provide valuable insights but they are still incomplete given the empirical evidence that has been accumulated over the years. While the endogenous growth models are intuitively and mathematically marked improvements on the earlier attempts at illuminating the dark alleys of the growth enterprise we cannot say with greater certainty that these models provide adequate lightening to help us see our way clearly. We would have to temper the theory with empirical evidence in order to generate greater illumination in our quest to understand the drivers of growth.

3. LONG-TERM GROWTH IN PER CAPITA INCOME, WHAT DOES THE EVIDENCE SAY?

Even though there are theoretical precepts that provide frameworks for empirical analysis of long-term growth there are no precise suggestions as to the range of variables or instruments to consider in growth modeling. Indeed none of the growth models provide comprehensive and conclusive set of determinants. It has been argued and rightly so, that the neoclassical and endogenous growth theories are essentially open-ended to the extent that they allow for various sensible and testable extensions resulting in a huge number of possible specifications (Mirestean and Tsangarandes, 2009). Let me illustrate this argument by drawing on the surveys of growth determinants undertaken by Darluf and Quah (1999) and Darluf, Johnson and Temple (2005). For instance Darluf and Quah (1999) identify 87 individual explanatory variables for the cross-country growth regressions in the literature. The authors then group these variables into 36 categories. On the other hand, Darluf et al (2005) finds 143 variables and classifies these into 43 broad groups. Mirestean and Tsangarides (2009) do a much better job by collapsing the broad groups of long-term growth determinants into just 10 categories.

The main categories of the determinants of growth are therefore: (1) Suggested variables and instruments representing the neo-classical and endogenous growth models (2) macroeconomic economic stability (3) financial development (4) trade regime (5) External environment such as given by terms of trade, capital flows, foreign direct investment, etc. (6) internal factors such as agricultural productivity, ethnic heterogeneity and ethno-linguistic diversity, etc., (7) the quality of public institutions, (8) war, conflicts and civil strife (9) Geographical attributes: distance from the equator, tropical climes and whether countries are landlocked or not, and (10) regional characteristics.

In addition to the 10 categories, there has been a growing strand of the literature on growth determinants that delve deeper by suggesting that historically transmitted characteristics partly explains differences in economic growth (Spolaore and Wacziarg, 2013). Along this line is the argument that European ancestry confers a strong advantage in development (Easterly and Levine, 2012), while the claim may sound bizarre this assertion draw on sound empirical modelling. The empirical evidence about the determinants of long-term growth is therefore not cut and dry.

You might be wondering, if these various studies suggest different determinants of economic growth then what is the way forward for economic development policy? Well, the answer is that no single growth determinant or combination thereof account for all the variations in growth outcomes of countries. This is because the coefficients of determinant (R^2) of the regression models are all less than one, which suggest that there are other possible sources of variation beside those suggested by the sophisticated modelling efforts.

It should be noted that the empirical link between natural resource abundance and economic growth outcomes particularly in Sub-Saharan African countries is well established in the literature. From the growth theories elaborated above natural resources can and should promote economic growth. Natural resource abundance may stimulate growth through investment in economic infrastructure, human capital development, etc. Theoretically, resource abundant countries must have higher growth rates. While historical evidence from resource

abundant developed countries including the United States of America, Australia, Canada and Finland support this assertion (de Ferrati et al, 2001) evidence from the developing world suggest otherwise (see Sachs and Warner, 1995, 2001 and Murphy, Shleifer and Vishny, 2000). There is vast empirical literature that suggest that natural resource abundance rather impede sustained long term economic growth, a phenomenon that has been described as the "resource curse" (Sachs and Warner, 1995, Garlagh, 2004).

At least six cogent reasons have been empirically identified to explain the notion of resource curse. The reasons are: (1) the *Dutch* disease – erosion of the external competitiveness of the non-natural resource sector (2) insufficient economic diversification (3) rent seeking[4] (4) weak political institutions and corruption (5) bad economic policies and (6) public debt. (Van der Ploeg, 2011). Incidentally, the worse economic growth performance in the world has been associated with countries with huge natural resource endowments. This observation lends credence to the resource curse notion.

Over the period 1960-2000, Congo DR, a country in the middle of Africa with unparallel resource endowment recorded an average growth rate of -4.0% per year (see Table 1). Angola also saw its economy contracting at a rate of 2%, Nigeria and Venezuela also recorded negative growth rates of 1.2% and 0.9% respectively. Nigeria and Venezuela, two countries that are leading crude oil exporters in their continents, Africa and South America respectively have had dismal growth outcomes over the 40-year period under discussion. While Nigeria seemed to have turned a corner over the last decade, at least in economic growth outcomes, Venezuela is still trapped. In as much as the compounding effect of marginal positive growth rates is profound in the long-term, the compound effect of these negative outcomes over a period of four decades is equally debilitating.

Table 1. Ten growth disasters, 1960-2000

Country	Growth per year (%)	Factor increase (GDP per worker)
Madagascar	-0.6	0.79
Zambia	-0.6	0.78
Mali	-0.8	0.74
Venezuela	-0.9	0.70
Niger	-1.0	0.66
Nigeria	-1.2	0.62
Nicaragua	-1.3	0.59
Central African Republic	-1.6	0.53
Angola	-2.0	0.44
Congo, Democratic Rep.	-4.0	0.20

Source: Darluf et al, 2005, pp14

Botswana appear to have bucked the trend and might have escaped the resource curse syndrome but a closer look at a number of economic and social indicators from the country

[4] The behaviour of increasing one's share of existing wealth without necessarily creating wealth- and thus leading to civil strife.

suggest that even at its admittedly high growth rates it would take a very long time for the country to transition into a developed-country status like South Korea and Singapore did in a generation. While Botswana is every African country's dream in terms of prudent economic management and growth outcomes over the last 50 years at the current rate it still has a long way to go. What is wrong with Botswana? Let's draw a comparison between Botswana and South Korea, two countries that have done very well over the period under discussion. Indeed, on long-term growth, Botswana has outperformed Hong Kong and South Korea all economies in South East Asia associated with the Asian growth miracle narrative. Botswana was the second fastest growing economy in the world for 40 years. It recorded on average a 6.1% growth rate per year yet the four Asian countries are all considered more developed than Botswana. See Table 2 below.

Table 2. Ten growth miracles, 1960 - 2000

Country	Growth per year (%)	Factor increase(GDP per worker)
Taiwan	6.3	11.3
Botswana	**6.1**	**10.6**
Hong Kong	5.7	9.09
Republic of Korea	5.4	8.24
Singapore	5.1	7.29
Thailand	4.5	5.83
Cyprus	4.3	5.39
Japan	4.1	5.04
Ireland	4.1	5.00
China	4.0	4.77

Source: Darluf et al, 2005, pp14.

Following suggestions from the endogenous growth models that human and knowledge capital accumulation are the key drivers of increases in long-term growth in per capita income I would want us to look at a selected number of socio-economic indicators for Botswana and South Korea. The indicators include proxies for human and knowledge capital accumulation among others. The knowledge capital indicator considered here is the *scientific and technical journal articles published* in the two countries[5]. Whereas South Korea produced 482 scientific and technical journal articles per million people Botswana managed 22 per million people. Educational attainment[6], a measure of human capital formation reinforces this outcome, the proportion of Botswana population over the age of 25 years that had tertiary education qualification in 2000 was 2.9% the figure for South Korea was 20.8%. Interestingly, by 2010 the proportion in South Korea has surged to 34.8% on the other hand Botswana had recorded a reduction to 2.7% (See Table 3).

[5] Scientific and technical journal articles refer to the number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences.

[6] Educational attainment is a commonly used proxy for the stock of human capital – that is, the skills available in the population and the labour force.

Human and knowledge capital accumulation has far reaching consequences for the entire economy. For instance, the level of knowledge and human capital stock is often reflected in the quality of work force and the kind of industries that can thrive in a given country. See Table 3. Botswana, like most resource dependent countries in Africa and elsewhere relies on primary industries - agriculture and extractive industries. On the contrary, South Korea is more into tertiary industries such as electronics, home appliances, telecommunications, shipbuilding, etc. Consequently, South Korea has low general unemployment rate (3.2%) as well as low youth employment (9%) which is largely due to the country's high level of human and knowledge capital stock.

Table 3. Comparative statistics of socio-economic outcomes: Botswana and South Korea.

	Botswana	**South Korea**
Average GDP growth 1960-2000	6.1%	5.4%
GDP per capita[1] (2012)	US$ 15,700	$31,900
Educational attainment[2]	1960 – 0.1% 2000 – 2.9% 2010 - 2.7%	1960 - 1.9% 2000 - 20.8% 2010 - 34.8%
Scientific and technical journal articles publications/million people (2010)	22	482
GINI[3] Index (2010)	0.61	0.31
Unemployment *General population* *Youth Unemployment*	 17.8% 32%	 3.2% 9%
Key Exports	Diamonds, copper, nickel, soda ash, meat and textiles	Semi-conductors, wireless telecommunication, motor vehicles, auto parts, computers, home appliances, ships, petrol chemicals
Industries	Diamonds, copper, nickel, salt, soda ash, potash, coal, iron ore, silver; livestock processing; textiles.	Electronics, telecoms, automobiles, chemicals, shipbuilding, steel.
Human Development Index, HDI[4]	0.633	0.905
Life expectancy	47 years	81 years

Notes:
1. GDP per is measured in purchasing power parity (PPP) to allow for international comparison.
2. Proportion of the population over 25 years that have tertiary education qualification.
3. The GINI coefficient is a measure of income inequality. Nought denote complete equality; 1, complete inequality.
4. The Human Development Index (HDI) is measure developed by the United Nations to measure and rank countries in terms of their social and economic development. It represents average achievement in key aspects of human development: a long and healthy life, being educated and having a decent standard of living. The maximum is 1 and the lowest 0.

Source: World Development Indicators (2013), the World Bank and Barro and Lee (2010) – educational attainment data.

Botswana on the other hand is sitting with a general unemployment rate of 17.8% and a youth employment rate of 32%. The quality of jobs also is reflected in the differences in inequality between the two countries (Gini coefficient for South Korea is 0.31 and for Botswana, 0.61). Certainly, something can be said about the link between low level of human capital and high levels of income inequality.

IV. RESOURCE NATIONALISM

Having explored the basic theoretical and empirical explanations regarding why certain countries have seen sustained growth in per-capita income over a long period of time whilst others falter or at best muddle through it is time to consider the vexed question of resource nationalism. Indeed the issue of resource nationalism is not peculiar to this country. As I will soon demonstrate, resource nationalism is a question of degree or extent of nationalisation it is not an all-or-nothing phenomenon. Put differently, the debate has to be about to what extent should resources be nationalized? This is because we already have varying degrees of nationalisation in place here in South Africa and many other parts of the world including countries from the developed world.

Resource nationalism is a broad term used to describe the situation where a state seeks to exercise greater control over its natural resources with the aim of capturing a greater share of the economic benefits that flow from the extraction of these resources.

Even though resource nationalism has attracted increased attention in the discourse regarding economic development policy options in the developing world including South Africa, it is an age-old issue. Ward (2009) identifies 3 main forms: (1) producer country resource nationalism - producer countries seek to control greater part of the benefits from the natural resource, (2) consumer country resource nationalism - consumer country seek to gain greater access or control of natural resources in other countries, e.g. China's quest for resources in Africa, (3) nationalism of investment target countries whose territories are considered as investment destinations by sovereign wealth funds derived from resource revenues or otherwise e.g., Resistance of countries to foreign take over of indigenous companies of strategic importance. However, I shall focus on the producer country type of resource nationalism since that is dominant form in our part of the world.

Broadly resource nationalism may be pursued through many ways: (1) outright takeover of businesses with due compensation or no compensation at all. (2) Increased state participation through greater equity participation or setting up greenfield state enterprises, (3) through fiscal policy (4) mandated beneficiation with the aid of punitive export levies, (5) mandated local input sourcing – local content laws and (6) local equity participation requirement. Recent nationalisation episodes in Africa have taken the following forms (1) imposition of increased royalties or mining taxes (2) mandatory requirement for state equity carry in mining and other extractive industries (3) indigenisation and local equity requirement (4) review of mining contracts for possible renegotiation or cancellation.

Resource nationalism may be benign in which case it may not impair the local economy materially. However, in some instances the approach could be vicious with untold consequences

for the local economy as exemplified by the kind pursued in neighbouring Zimbabwe where farms were appropriated without due compensation in most instances. This form may endanger a country's long term economic prospects.

There is marked difference between the resource nationalism pursued in the 1960s and 1970s and the new wave of resource nationalism which began in the 2000s following the global commodity super cycle. So clearly, we have been here before. The past wave of nationalisation in Africa covered both natural resource-based companies as well as non-resource based enterprises following political independence. This was largely ideologically driven. I came across an interesting letter written by Oliver Tambo, a stalwart of the ruling ANC, in 1967 to Julius Nyerere the first leader of independent Tanzania on the occasion of the nationalisation of all banks in Tanzania in May 1967. And he wrote:

> "we particularly wish to commend you and the TANU[7] National Executive for the clear enunciation of the basic elements of socialism in African conditions in which public ownership of the means of production is based on self-reliance and democratic government. The principle of nationalisation has also been placed in vivid perspective, showing the only way in which the resources and heritage of the people can be restored to them". (Tambo, 1967)

In the 1960s and 1970s resource nationalism was entirely a producer-country phenomenon and most importantly the "resource curse" notion had not been extensively tested empirically and government intervention in the economy was quite consistent with the general thinking about economic development. However, the new wave of resource nationalism has entirely different set of motivations. They are rather targeted or limited as compared with the sweeping nationalisation of the past and I would imagine the cautious approach is due to the preponderance of empirical evidence that cast doubt on the usefulness of nationalisation as a policy option.

In the 1970s, Kenneth Kaunda nationalised mines in Zambia without acrimony as the country paid due compensation to the then British owners, Salvadore Allende rather violently ceased mines in Chile (Yergin and Stanislaw, 1998). Ghana's military leader also nationalised all major foreign owned businesses in the early 1970s. The nationalisation frenzy was the norm in most developing countries as people thought by controlling the commanding heights of their national economies they could propel their countries to rapid economic development. On hind sight it is not difficult to reach the conclusion that the nationalisation policies produced disastrous outcomes across the continent and elsewhere. Consequently, the 1980s saw the beginning of policy reversals. Privatisation became the new buzz word. Between 1991 and 2001 over 2,270 firms were privatised across Africa at a sale value of US$9bn.

The reasons for the about-turn are very well documented. While the international financial institutions including the World Bank and the IMF were instrumental in getting countries to adopt privitisation as part of the conditionalities for the Structural Adjustment Programmes in the 1980s and 1990s, there were also cogent reasons for governments to divest itself from the state owned enterprises. The Nigerian president Obasanjo articulates the reasons clearly and

[7] Tangayika African National Union

I quote him “state enterprises” he said “suffer from fundamental problems of defective capital structure, excessive bureaucratic control or intervention, inappropriate technology, gross incompetence and mismanagement, blatant corruption and crippling complacency” (See Harsch, 2000). The observations of the former president Obasanjo are so profound and spot on. The flaws ideintified by the Obasanjo have been the bane of many state owned enterprises in Africa and elsewhere in the world.

Across Africa most countries abandoned the nationalist and state ownership policy and resorted to vigorous programme of privitisation, reverse nationalisation you may say. Countries that have seen major privatisation initiatives include but not limited to Ghana, Tanzania, Uganda, Nigeria, South Africa and many others. In the past few years there have been agitations for re-nationalisation in many countries, including developed ones. However, the new wave of nationalisation is more nuanced and sensible in most instances. For instance, a number of countries have used increases in taxes and royalties to capture more of the resource rents that their mineral wealth generates particularly in the wake of the recent commodity super cycle, e.g., Argentina, Ghana and Mexico.

Others have also used restrictions of imports and exports, mining reforms and the use of fiscal policies as a fashionable new instrument to effect nationalisation. Even amidst the new surge there is evidence of retreat in the use of fiscal policy as others have also scaled back new policy proposals aimed at capturing a greater share of their mineral rents. For instance, Australia abandoned the Mineral Resource Rent Tax introduced in 2012, which levied annual profits above US $70 million on iron ore and coal at a rate of 30%. The tax was meant to capture a greater share of the resource rent following the decade-long commodity boom but the new tax failed to live up to its billing as the forecasted revenues failed to materialised.

What is becoming increasingly fashionable is a form of state participation in the mining and oil industries through: (1) full equity participation (2) carried equity participation (3) “free” equity participation and (4) participation through production sharing (MacPherson , 2008). We see examples of this in many countries, indeed South Africa’s revised Mineral and Petroleum Resources Development Amendment Bill advocates for free carried interest of 20 percent in all new exploration and production rights in the petroleum industry and also allows the state to acquire unspecified additional stake at an *agreed price* (MPRDA Bill Section 65).

The other option is nationalisation without compensation. Is this a viable option for South Africa? I don't think so. The South African constitution protects private property rights and as a result a just and equitable compensation would have to be paid for the appropriation of private property. Estimates suggest that acquisition of the listed mining companies will cost something in the region of 2.8 trillion rand. The valuation is based on the market capitalisation of the listed resource-based firms. Note that the amount is more than twice the 1.2 trillion rand budgeted government expenditure for the year 2014. Now, if government decides to pay for the acquisition with loans the interest payments alone will be extremely burdensome for the budget.

Nationalisation without compensation will rather be disastrous. Apart from litigations that it would arise it will also result in a drastic reduction in foreign direct investment and South Africa being shut out of the international capital market. Currently, the deficit in the current

account is largely financed with inflows from overseas. A drastic fall in capital flows will have dire consequences for the exchange rate as well as the large economy. Worse still, ordinary workers from both the public and private sectors would take a hit. For example, in addition to the direct 8% stocks of AngloGold Ashanti held by the Government Employees Pension Fund (GEPF), local fund managers who also manages pensions among others such as Invest Asset Management, Allan Gray, etc owns about 12% so in effect workers and pensioners in the country own a considerable chunk of the mining company and a seizure without compensation would be a great loss for pensions. In any event controlling the mining firms would not solve the developmental challenges that the country faces.

Given what know from economic growth theory and the empirical evidence regarding the important drivers of sustainable growth in per-capita income we see very little role for natural resource endowment. Without a doubt, state ownership of resource-based companies runs the risk of being a drain on the public purse if history is anything to go by.

V. CONCLUSION

Mr Vice-Chancellor, constant innovation is the only way to sustained long-term growth in per-capita income. Natural resource advantage in today's world is neither a necessary nor sufficient condition for economic development. The growth outcomes in South Korea and the other South East Asian countries such as Singapore and Taiwan provide valuable lessons for us. While I am not suggesting that we should disregard our natural advantages policy makers ought to devote more attention to human and knowledge capital formation, safeguard property rights, strengthen public institutions and facilitate infrastructure development to stimulate growth.

More specifically, our educational system need to be strengthened to provide quality education and training, facilitate life-long learning and learning-by-doing in an effort to build our human capital stock at a faster pace. Regarding knowledge capital, efficient tax incentives that drive R&D investment by both the public and private sectors must be explored and vigorously implemented.

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