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Economic Growth Theories, And the Managing of Oil Curse; The Effect of Corruption

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ABSTRACT

The paper discusses that Corruption, resources, private investment and economic growth are related. The inference is that the potential benefits of rising corruption in deeply authoritarian nations are practically greater than any other government intervention. Corruption awareness is essential in policy decisions that accelerate the policy platform. Emerging economies, notably the Middle East and North African countries with ample resources, can make a major contribution. further, the impact of corruption on the accumulation of human capital across two channels. It occurs on the first channel. It has the impact of corruption in public education spending and the second path. Corruption in spending on physical capital and investment. The paper argues that the pace of the reform initiatives is crucial and that the success of the policies is affected by corruption and affirms the existence effect in human resources and corruption.

Keywords: corruption, resource curse, economic growth

INTRODUCTION

Natural resources undoubtedly play an important role in the economy of many countries. The conventional wisdom is that the wealth of natural resources, particularly oil and minerals, should stimulate economic growth. Resource deposits are considered natural assets that can become capital that would support economic development. However, reality has shown that this has been the exception and not the rule. In fact, with very few exceptions, resource-rich countries have experienced poor economic growth and significant socio-political instability. Also, numerous empirical studies have provided evidence of an inverse relationship between growth and dependence on natural resource revenues. This phenomenon is called the ''resource curse''(Rees, 2017).

The "natural resource curse" is a term coined by (Auty & Warhurst, 1993) and bullet-proof by the results of (Sachs & Warner, 1995; J. D. Sachs & Warner, 1999) to explain why countries with the higher relative wealth of natural resources tend to grow at rates lower than countries with fewer natural resources.

Rich-oil countries have failed to be economically developed and lagged behind other countries. The slow growth of these economies is noteworthy since possesses large reserves of oil and natural gas. It is expected that the export revenues of these natural resources should give these countries an advantage over countries without rich natural resources. Since they failed to use this advantage to increase its economic development, it is outperformed by many countries with less favourable conditions for economic growth (Lundahl & Sjöholm, 2008).

ECONOMIC GROWTH MODELS

There are two categories of growth theories in economic growth literature, those based on Solow (1956) growth model also known as neoclassical growth models or exogenous growth models and those based on Lucas's concept of endogenous growth model (1988) and (Romer, 1986).

The Solow Growth Model

The Solow growth model explains the long-term growth rate throughout the accumulation of capital and exogenous population change rates and technological advancement. It assumes that if countries are similar in terms of technological progress rate and population growth, poor countries tend to grow faster than rich countries and eventually reach or converge to rich countries ' income levels due to decreasing capital returns. The Basic Solow growth model is generally presented throughout a Cobb-Douglas production function

$$Y = AK^{\propto}L^{1-\alpha} \qquad (1.1)$$

Where Y denotes the level of output, A denotes the level of technology, L denotes the amount of labour input, K denotes the input of capital and $\propto$ denotes the share of capital in output. Where $\propto$ is positive and lies between 0 and 1, $0 <\propto< 1$ It is possible to obtain output per worker by dividing equation (1.1) by L. It is worthwhile to mention that a constant saving was adopted by Solow's Model. Unlike the Solow model, Ramsey (1928)built a growth model popularly known as the Ramsey-Cass-Koopmans model which improve the Solow model by endogenizing the saving rate (Bhattarai, 2004).

Mankiw, Romer, and Weil (1992)begin their empirical cross-country investigation using the basic Solow model where aggregate output in country*i* (Y_i)is determined by physical capital stock (K_i) and technology-augmented labour. $Y_i = K_i^{\propto}(AL_i)^{1-\alpha}$. Where A and L are assumed to grow exogenously at rates g and n repectively.

the motion equation of this model is $\frac{dk_i}{dt} = s_{ik}y_i - \delta k_i$, where s_{ik} is the saving rate and δ is the rate of depreciation of capital. It implies that k_i converges to steady-state k^*.

Once the k^* is solved, replace it with the production function and take logs to obtain the basic Solow Cobb-Douglas equation

$$\ln\frac{y_i}{L_i} = \ln A(0) + gt + \frac{\propto}{1-\propto}\ln(s_{ik}) - \frac{\propto}{1-\propto}\ln(n+g+\delta) \quad (1.2)$$

The authors indicate that ignoring human capital leads to incorrect conclusions in the basic Solow model. thus, by introducing human capital as an additional factor of production, the authors extend the basic Solow model:

$$Y = K_t^{\propto} H_i^{\beta} (AL_i)^{1-\alpha-\beta} \quad (1.3)$$

Where H denotes the human capital stock, α denotes the physical capital stock, βdenotes the human capital stock. Where $0 < \propto < 1$ and$0 < \beta < 1$. The motion equation of physical and human capital are

$$\frac{dk_i}{dt} = s_{ik}y_i - \delta k_i \text{ and } \frac{dH_i}{dt} = s_{ih}y_i - \delta k_i ,$$

where s_{ik} is the income fraction invested in physical capital, s_{ih} is the income fraction invested in human capital and δ is the capital depreciation rate.

The equation of motion implies that k_i and h_i converges to a steady-state value k^* and h^*. The extended Solow equation is obtained by replacing $k^*$and h^* in the production function and taking logs:

$$\ln\frac{y_i}{L_i} = \ln A(0) + gt + \frac{\propto+\beta}{1-\propto-\beta}\ln(n+g+\delta) + \frac{\propto+\beta}{1-\propto-\beta}\ln(s_{ik}) + \frac{\beta}{1-\propto-\beta}\ln(s_{ih}) \quad (1.4)$$

It is evident from the above equations that technological progress is the driving force of the growth process in the steady-state of the Solow model. The model, however, did not address how technological progress is created and how it affects the output's long-term growth rate. This leads to the endogenous growth theory being developed.

Endogenous Growth Model

Endogenous growth models claim that endogenous factors, i.e. investment in human capital and innovation (new technologies), determine long-term growth. The Endogenous models focus primarily on two main issues: firstly, the positive externalities and the spill over effects of an educated workforce in determining the rate of technological innovation and long-term growth. Secondly, on some of the ex-post monopoly power technological advances resulting from purposeful research and development (R&D) activity. The logic behind this is that if there is no tendency to run out of ideas, in the long run, the growth rates can remain positive (Barro,1997).

Lucas (1988) describes the increase in labour productivity as a process in which people decide on their allocation of time between acquiring education and working in the manufacturing sector based on standard (inter-temporal) maximization of utility. A fraction of (u) is spent in their time working and a fraction of (1 - u) in their time studying.

Bhattarai (2004) argues that the rationale behind Lucas's model is that human capital tends to grow faster when people spend more time studying because they learn more and become more qualified. This increases the per capita human capital available in the economy and increases the worker's skills and productivity. consequently, both internal and external effects of human capital.

The major source of output growth is such an increase in productivity compliments with physical capital accumulation.

A growth model was presented by Lucas in which output is generated by a production function,

$$Y = AK^{\propto} (uhL)^{1-\alpha} \qquad (1.5)$$

Where h denotes human capital per worker, u denotes the fraction of time spent on working, L denotes the labour where $0 <\propto< 1$.

Unlike Solow's model, one of the important features of Lucas ' model is that long-run growth is a function of both physical and human capital investment. Therefore, both in the short run and in the long run, there is an important role in education. Besides, human capital is determined endogenously and has no decreasing returns.

Romer (1990)incorporates technological progress by introducing the sector of R&D, resulting from researchers interested in taking advantage of their invention. Bhattarai (2004) points out that the model suggests that there are three sectors in the economy: research, intermediate and final good sectors. Therefore, the research sector produces new ideas and sells to an intermediate sector the exclusive right to produce a specific capital good. The intermediate sector produces the capital good and sells it to the output-producing final good sector (Bhattarai, 2004). The Romer model's production function is similar to the Solow model's labour-augmented technology as

$$Y = K^{\propto} (AL_Y)^{1-\alpha} \qquad (1.6)$$

Where A denotes productivity or knowledge, either total labour L can be used for the production of goods, L_Y , or to generate new ideas $L_A = L_Y + L_A$.

Jones (1995) points out that the number of new ideas depends on how many people are involved in research, L_A. Jones (1995) points out that the number of new ideas depends on how many people are involved in research, the average productivity in the research sector $\bar{\delta}$ and the inventory of existing knowledge A (Bhattarai, 2004).

The general production function of new ideas is , therefore, $\dot{A} = \delta L_A^{\gamma} A^{\emptyset}$. where $0 < \emptyset < 1$, dividing by A, we get, $\frac{\dot{A}}{A} = \delta \frac{L_A^{\gamma}}{A^{1-\emptyset}}$. after taking log and differentiation, this equation determines the rate of growth of the technology by the rate of population growth in the steady-state,$a = \frac{\delta n}{1-\emptyset}$, therefore, thegrowth in the population benefits growth as the economy can afford to place more people in t he research sector (Bhattarai, 2004).

Dynamic Optimisation

Recently, growth models employ dynamic optimization tool to analyze the process of capital accumulation and characterize a set of parameters critical to the balanced growth path (Koopmans, 1965; Lucas 1988; Romer, 1989), etc). Following Bhattacharyya and Hodler (2014), this model implies maximizing the utility of the household of infinite life.

$$max_{c_t} U_0 = \int_{t=0}^{\infty} e^{-pt} \frac{C_t^{1-\sigma}}{1-\sigma} dt \qquad (1.7)$$

Subject to technological constraints ($0 <\propto< 1$)

$$Y_t = A_t K_t^{\propto} N_t^{1-\propto} \quad (1.8)$$

Capital accumulation

$$\dot{K}_t = Y_t - N_t C_t - \delta K_t \quad (1,9)$$

Market cleaning

$$Y_t = C_t + S_t \quad I_t = S_t \quad (1.10)$$

Initial (boundary) condition $K_O = K_0$; assuming ($A_t = 1$: $N_t = 1$)
The problem of optimisation is often formulated in the form of a Hamiltonian current value as

$$H(C, K, \theta) = \frac{C_t^{1-\sigma}}{1-\sigma} dt + \theta_t [K_t^{\alpha} - C_t - \delta K_t] \quad (1.11)$$

Where C denotes consumption, K denotes capital stock and θ denotes the shadow price of capital stock regarding utility. The optimal path of accumulation of capital is found using four conditions of the first order as follows:
Control

$$\frac{\partial H(C,K,\theta)}{\partial C_t} = 0 \rightarrow C_t^{-\sigma} = \theta_t \quad (1.12)$$

State and co-state

$$\dot{\theta}_t = \rho\theta_t - \frac{\partial H(C,K,\theta)}{\partial k} \rightarrow \dot{\theta}_t = \rho\theta_t - \theta_t [\alpha K_t^{\alpha-1} - \delta] \quad (1.13)$$

State

$$\dot{K}_t = Y_t - N_t C_t - \delta K_t \quad (1.14)$$

Boundary

$$\lim_{t-\infty} e^{-\rho t \theta_t} K_t = 0 \quad (1.15)$$

The above four first-order conditions indicate the shadow price of capital in terms of marginal utility of consumption; the shadow price is sensitive to subjective discount factor and capital constraint; the equation of capital accumulation and the final terminal condition does not imply the need for capital at the end of the planning horizon.

Where the capital stock $\frac{\dot{K}}{K} = g_K$, consumption $\frac{\dot{C}}{C} = g_c$, and the shadow price of capital $\frac{\dot{\theta}}{\theta} = g_\theta$. these involve that they stay constant in the balanced growth path.

We can obtain in the balanced growth path from the first second-order condition

$$\alpha K_t^{\alpha-1} - \delta = \rho - \frac{\dot{\theta}_t}{\theta_t} + \delta \quad (1.16)$$

Equation (1.16) implies that the cost of capital should be equal to the marginal productivity of capital. By assumption $\frac{\dot{K}}{K} = 0$, $\frac{\dot{Y}}{Y} = 0, \frac{\dot{C}}{KC} = 0$. This implies that when the stock of capital is not growing, production is not growing in the same way either, as when the stock of capital is not growing, consumption is not growing either.
There is also no increase in the shadow price in the steady-state, as is clear from the log differentiation of the first four order condition

$$\frac{\dot{\theta}_t}{\theta_t} = -\sigma \frac{\dot{c}_t}{c_t} = 0$$

thus, output, consumption and capital stock in steady-state are:

$$\alpha K_t^{\alpha-1} = \rho - \frac{\dot{\theta}_t}{\theta_t} + \delta \rightarrow \alpha K_t^{\alpha-1} = K^* = \left(\frac{\rho+\delta}{\alpha}\right)^{\frac{1}{\alpha-1}} \quad (1.17)$$

$$Y^* = \left(\frac{\rho+\delta}{\alpha}\right)^{\frac{1}{\alpha-1}} \quad (1.18)$$

$$C^* = Y^* - \delta K^* = \left(\frac{\rho+\delta}{\alpha}\right)^{\frac{1}{\alpha-1}} \left[\left(\frac{\rho+\delta}{\alpha}\right)^{\frac{1}{\alpha-1}} - \delta\right] \quad (1.19)$$

In the steady-state, the saving rate:

$$S = \frac{\delta K^*}{Y^*} = \frac{\delta \left(\frac{\rho+\delta}{\alpha}\right)^{\frac{1}{\alpha-1}}}{\left(\frac{\rho+\delta}{\alpha}\right)^{\frac{\propto}{\alpha-1}}} = \delta\left(\frac{\rho+\delta}{\alpha}\right)$$

The above equation, unlike what Solow model was assumed, the saving rate here is assumed to be determined in terms of parameters of preferences and technology.

Besides, the higher discount rate of capital reduces capital but increases the level of savings rate in the steady-state, whereas higher discount for future consumption implies higher savings rate but higher productive capital (Bhattacharyya & Hodler, 2014).

Thus, the economy's long-term growth path is determined by a set of preferences and technology parameters that are in turn determined by economic policy and institutions (Bhattacharyya & Hodler, 2014).

Growth theories identify two fundamental sources of growth namely: the rate of factor accumulation and total factor productivity (TFP) growth. The first relates to investment in human (education, experience and health) and physical, as well as to the raise of the workforce, while the latter relates to productive efficiency resulting from the generation of new ideas and better ways of doing things (technological advancement). It has been arguing by Scholars that, despite the critical role these key sources play in determining a country's long-term growth, they are motivated by the quality of the country's institutions, geography, and economic policy.

Endowment Hypothesis

A large number of publications have been growing that try to explain the links between oil abundance and economic performance, while the causes behind the curse of resources are still a matter of debate, there is a consensus on the fact that the adverse relationship between oil wealth and growth is not associated with the mere existence of the natural resource itself. The oil itself cannot encourage or impede economic growth (A. Boschini, Pettersson, & Roine, 2013; Davis & Tilton, 2005; Karl, 2007; Ross, 2013).

The literature on the macroeconomic consequences of natural resources highlights several channels are provided to explain what drives this phenomenon, such as the so-called Dutch Disease.

The Dutch disease is a term that originated in the sixties when the Netherlands discovered a large field of natural gas. The export of this product became a booming industry, but at the expense of the country's traditional manufacturing sector. Countries like Australia, the United Kingdom and Norway experienced similar setbacks. Being abundant in natural resources is something that could be a barrier to the country's long-term economic growth. The countries mentioned above managed to diversify their economies in such a way that the long-term negative effect is no longer felt today, but other countries such as Mexico, Nigeria and Venezuela did not have that success (Bjørnland & Thorsrud, 2016; Ebrahim-Zadeh, 2003; Toto Same, 2008).

Many studies find that developing countries with abundant natural resources are ironically disadvantaged as their economic development occurs more slowly than that of other developing countries. J. D. Sachs and Warner (1997) were one of the first scientists to test empirically whether the resource curse exists. Many scientists have used their data and model as a basis for their research. These empirical analyses have provided more clarity about the indicators of the resource curse. Institutional quality is an important influence on the relationship between natural resources and economic growth (Gylfason, 2004; Mehlum, Moene, & Torvik, 2006). A. D. Boschini, Pettersson, and Roine (2007) find that not only institutions but also the type of natural resources define the possibility of a curse of resources.

It has often been observed in resource-rich countries that income windfalls tend to be channelled into low-return, overly ambitious projects that crowd out private investment. Revenue instability produces a period of boom and downturn in policy spending, combined with a very large cost of change of expenditure. (see (Deaton & Miller, 1995; J. Sachs & Warner, 2001; J. D. Sachs & Warner, 1999; Sala-i-Martin, 2003); Sala-i-Martin and Subramanian, 2003; Sachs and Warner, 1999 and 2001, (Devlin & Titman, 2004).

There has been much discussion about the paradox of resources in oil-exporting economies. However, a very intriguing question regarding the development achievements of oil-rich countries remains and deserves some attention (Reader, 2015). Why did these economies, ceteris paribus, perform differently in terms of growth results even though they initially adopted the same model of oil-driven development? In other words, what are the factors that could explain your contrasting results in terms of economic performance?

These oil-rich nations have been chosen for their similarities to some of their specific resource base conditions [oil, degree of dependence and per capita abundance], their analogous socialist model of oil development and their clear differences with respect to the intensity and Dynamics of their development results. Despite their common characteristics, one could argue that the comparison of these countries is misleading because they remain different in several aspects. However, we believe that the panel chosen remains relevant to assess the links between oil revenues and economic growth within the framework of the curse of resources (Movchan, Zotin, & Grigoryev, 2017).

The research was done by A. D. Boschini et al. (2007) 2confirms the conclusion that the quality of institutions is decisive in whether a country is cursed because of its resources. In addition to this conclusion is that apart from the institutions, the type of resources that a country possesses also determines whether a country is facing the resource curse. According to them, there are some resources that in combination with bad institutions are more likely to cause rent-seeking, corruption or conflicts. To obtain results on this matter they run a regression based on the data of J. D. Sachs and Warner (1997) but modify their model. They identify the different types of resources and add a variable that combines the quality of institutions and the type of resources a country has. Their results confirm their hypotheses. They find that especially diamonds and precious metals are resources that are sensitive to attract the resource curse when they are combined with bad institutions.

Other opponents of the resource curse are (Brunnschweiler & Bulte, 2008). They state that when 'resource dependence' is used as a proxy for resource abundance, which means export of natural resources as a percentage of GDP, instead of actual resource abundance, which is the stock of the natural resource, the resource curse is detected. Resource abundance is positively related to economic growth and institutional quality. Resource dependence is negatively correlated to economic growth as tested before by (J. D. Sachs & Warner, 1997), but this effect becomes insignificant when a proxy for resource abundance is added to the regressed model.

The reason for this conclusion according to them is based on the effect that resource rents have on economic growth and institutional quality. This effect might be different than the effect of resource stocks, which might still be in the ground. Resource rents might cause the rent seeking behaviour and corruption that create the effects appointed by the previous researches.

Corruption and growth

we develop a theoretical model by extending the neoclassical model of economic growth, we lay the groundwork for investigating the impact of corruption in resource-endowed economies. The implications of a deeper understanding of these relationships could have a significant impact on emerging economies, as many have been blessed-cursed with hydrocarbons and minerals which constitute a large portion of exports and government revenues.

Corruption, commonly defined to be the abuse of public power for private benefit, is a pervasive and universal phenomenon and affects almost every culture to differing degrees. As witnessed throughout history, corruption affects democratic and non-democratic countries, rich and poor countries, and corporations alike. Corruption poses a threat to private investment for several reasons: it reduces public and private sector efficiency when it enables people to assume positions of power through patronage rather than ability; distorts the financial-economic and environment; and, at the limit, introduces instability and anarchy into the political process and, at the limit, introduces instability and anarchy into the political process (Everhart, 2010).

We believe that understanding the connection between corruption, resource endowments (specifically, their management), and investment is important for several reasons. First, understanding the determinants of investment is important in its own right. Many resource-endowed developing countries are eager to attract foreign investors and the advanced technologies they bring. If private investors avoid countries because they are viewed as corrupt or

the government's resource management is viewed as predatory, then this will have important implications for long-term growth. Second, the potential interaction effects of corruption between resource endowment and private capital need to be explored, then extended to other factors of production such as human capital. Third, policy recommendations emanating from such research can drive the reform agenda in emerging countries.

The goal is to establish an economic output model which specifically integrates the potentially significant effect of corruption on economic output and the potential impact of corruption on economic output, via influencing the management of resources, private investment levels, and management. Our theoretical model directly connects corruption, natural resource abundance, private investment and economic performance. Finally, we examine the policy implications.

An environment in which there is a prevalence of corruption and bribery creates a difficult to predict investment returns. This uncertain climate has two main impacts on decisions on private investment: potential gains are decreased as a consequence of rising prices, and the distribution of findings is greater. Both are done to minimize private investment, essential for sustainable development in the long term (Everhart, 2010). Policymakers should also be concerned about the impact on corruption, if not for the long-run implications for economic growth, then for the immediate impact on budgets.

Corruption and governance

To properly examine the influence of corruption on investment and economic output, we must incorporate the quality of governance. Corruption and governance are, we believe, causally related. One of the risks of poor governance is that it may create greater opportunities for corruption.

The impact of governance analysis is plagued by measurement and definition problems. Even if it can be settled upon, how will the government be measured? Governance is described by World Bank (1992) as a "how to exercise control in the administration of the economic and social resources of a country for growth" Effective governance is reflected in stable, transparent and responsible democratic structures; a legislature with a competent and responsive executive branch of government, a powerful civil society engagement in public affairs, and everyone functioning in line with the rule of law.

We define governance, similarly, focusing on how a government discharges its responsibilities. Countries practising good governance would, therefore, be expected to practice good management of resource endowments. Governance, therefore, covers a wide range of government activities and is a larger concept than corruption. The burgeoning number of indices serves as testimony to interest in the subject.

A functioning private sector requires the rule of law; enforcement of property rights and contracts; an independent, strong judiciary with transparent and effective bankruptcy procedures; transparent tax systems; effective bank supervision; and the strict enforcement of bank prudential regulations. These are the hallmarks of good governance, regardless of the formal definition. Fostering such an environment will not only help reduce corruption but also stimulate saving and investment, thereby laying the foundation for long-term growth (Everhart, 2010).

If good governance reduces corruption, then literature suggests that the incentive for improving governance is significant. (M. P. Mauro, 1996; P. Mauro, 1995) and Everhart (2010) argues that the effect of corruption on private investment decreases economic development and Wei (1997) draws clear conclusions from corruption on foreign direct investments (FDI). Kaufmann, Kraay, and Zoido (1999) found that corruption restricts per capita growth, infant mortality and literacy. Wei and Bai (2001) argue that corruption impacts economic decision making and influences legislative decisions. Though specific methodologies raise doubts about issues of causation, several authors suggest that corruption is negatively associated with several crucial economic variables (Lederman, Loayza, & Soares, 2001).

Klitgaard (1998) asserts that corruption is enhanced by the presence of monopoly power and discretion and is diminished by the presence of accountability (good governance). When governance limits the monopoly power of those government officials issuing building permits, import licenses, granting concessions, etc. then this oversight (strong governance) helps make officials more accountable and may help reduce corruption.

Corruption and its impact on private investment

There are many types of public corruption, including embezzlement of public funds, theft of state property, accepting bribes to shorten processing time, illegally obtaining or exercising monopoly power, or securing government procurement. Tanzi and Davoodi (1998) offer a common definition of corruption: the abuse of public power for Research on corruption has expanded in recent years yet work investigating its impact on private investment is still in its infancy. (M. P. Mauro, 1996; P. Mauro, 1995) find that an aggregate institutional indicator, a "corruption indicator," is negatively associated with an aggregate investment in his sample of countries. Mo (2001) also finds that corruption reduces the share of investment in his sample of but 46 countries. Brunetti and Weder (1997) present results from a survey of entrepreneurs that suggests the perceived reliability of the judiciary, government instability, and corruption influence cross-country differences in aggregate investment.

There is a line of economic research that views corruption as a tax on private investment (Murphy, Shleifer, & Vishny, 1993; Wei, 1997). A corruption tax generally has a disproportionate effect on transaction costs, particularly burdensome for activities such as investment projects that by nature involve a long-time horizon and a multiplicity of logistic, administrative and legal steps. Each of these steps is liable to incur corruption taxes, each cascading over the other. The result is both an increase in the cost of capital and a reduction in its anticipated profitability, as well as a relative incentive toward investments involving fewer administrative steps: that is, the tax, like any other tax, can be distorted, too.

The resource curse

There is no consensus about how resource abundance will impact economic development although there are three major types of illustrating in literature: Dutch disease models, institutional models and rent-seeking models. The two last ones are particularly important to our investigation. The Dutch disease hypothesis is the most popular class of theories that a rise in wealth would deter a nation from activities that would contribute to long-term prosperity (Iimi, 2007). A resource boom allows the exchange rate of a nation to increase, allowing manufacturing exports to decrease or eliminating manufacturing resources and labour, thus raising the cost of production. The Dutch

disease has fragmented empirical support to clarify the resource curse, but we are not following this work path (Brahmbhatt, Canuto, & Vostroknutova, 2010).

Institutional explanations

Throughout such studies, resource typically manifests itself through weak macroeconomic strategies, often by a decrease of savings and expenditure because of productive usage of capital instead of taxation or other exports. Authors see a correlation between resources and institutions and see that the resource category is relevant, and the government structure is an outstanding feature of the institution. Atkinson and Hamilton (2003) suggest that the host countries' failure, culminating in lower or negative "authentic savings rates," could be attributed to a burden from the incapacity to successfully handle capital profits. Auty (2001)claims that energy-rich countries such as oil fields and others that have so-called "point resources,"

Leite and Weidmann (1999) propose in their empirical analysis that resource capital has no direct impact on economic growth, yet that there's a substantial indirect influence: resources affect the degree of corruption, which in turn influences production. Papyrakis and Gerlagh (2006) argued that rising resource rents contributed to a decline in spending that decreased with time and dramatically lowered long-term incomes. Investment declines more than account for the rise in taxes from the capital. If labour productiveness is necessarily contingent on the amount of spending, the fall in savings and expenditure results in a decline in productivity that exceeds.

Rent-seeking models are focused on the premise that rental of resources is conveniently acceptable and that this, in effect, contributes to corruption, abuse of public policy and labour diversion. Yet the simple reason for rent-seeking is a little blunt. Attempts have been made to improve rental structures of several balances, where comparative statics are based on the individual equilibrium. The effect of resource abundance on development is context-specific and primarily dictated by "original factors." In such structures.

Leite and Weidmann (1999) claim that the abundance of natural resources provides incentives for rent-seeking activity and is a significant factor in deciding the extent of corruption in a region. They demonstrate that the degree of corruption depends on the availability of natural capital, policy policies, and the concentration of bureaucratic authority. Interestingly, they indicate that the growth impact of natural resource discoveries and anti-corruption policies depend on the state of development of the country, with corruption having a greater influence on developing economies.

Petermann, Guzmán, and Tilton (2007) find that fuel and non-fuel mineral exports affect corruption differently, with corruption increasing with fuel exports unambiguously, and non-fuel exports increasing corruption only in poor countries. Notably, they find that in richer countries, non-fuel mineral exports reduce corruption. They also observe that in the early stages of economic development, advances in per capita income are associated with greater corruption, suggesting a much more complicated link between corruption, mineral dependency and per capita income.

Theoretical model

In this section, we develop a model of economic output that explicitly incorporates the potential direct impact of corruption on economic output and the potential indirect effects of corruption on economic output through its influence on resource endowment management, the level of private

investment and governance. The current literature on the impact of corruption lacks a theoretical framework that incorporates the potential indirect effect of corruption on output through resource endowment management and the direct effect of corruption through its impact on governance. The literature to date has only examined the hypothesized influences separately (if at all), ignoring the aggregate impact of corruption on output. While the potential influence of corruption on output through investment is not one of the conventional arguments for anti-corruption efforts, ignoring this potential effect, we believe, would inject a priori bias into our model. By examining the impact of corruption with a neoclassical model of output we can explore how corruption and governance influence investment, and the trade-offs between resource endowment management and private investment (Everhart, 2010; Everhart & Sumlinski, 2001).

To properly examine the influence of corruption on investment and economic output, we must also incorporate the quality of governance in the theoretical model. Corruption and governance are, we believe, causally related; an argument supported by the current literature on the relationship between corruption and governance. Brautigam (1992) and others have suggested that the quality of governance is an important determinant in a country's economic development, yet it is difficult to find convincing empirical evidence to confirm this notion. Further, while it is difficult to define and measure governance, it is even more difficult to find agreement as to what constitutes "good" governance. Despite the measurement and definitional challenges, we include a measure of governance in the theoretical model.

There is also little evidence in the literature on the effect of corruption on human capital. Corruption is unlikely to benefit society rather than enriching a few. Indeed, economic theory will suggest that if the returns to corruption and leasing output are higher than the returns of even more traditional operations, resources will be transferred from usual activities to unethical practices. Corruption could de-capitalize society through its effects on human capital (Boikos, 2016).

In response to the various shortcomings in the theoretical reviews presented to date, we develop a neoclassical model of economic growth that explicitly includes human capital accumulation and the direct and indirect effects of corruption on economic growth. We believe that using the neoclassical growth modelling approach to the question of the impact of corruption on economic growth is superior to previous studies employing a variety of approaches that ignore the potential indirect effect of corruption on economic growth through investment and governance quality. A significant advantage of adopting the neoclassical approach to the question of the determinants of economic growth is that it allows us to explicitly incorporate the indirect effects of corruption and potential trade-offs (Everhart, 2010).

Most macroeconomic models fail to explicitly distinguish between public and private capital, treating these types of capital as one homogenous input in the production function. Prior examinations of the impact of corruption have also failed to consider the potential indirect effects of corruption on resource endowment management and economic growth. If corruption does influence the quality of resource endowment management, then the failure to include this effect in the theoretical framework may lead to erroneous conclusions on the impact of corruption. Following (Mankiw et al., 1992), and building on Everhart (2010), we develop an augmented Solow (1956) neoclassical model that addresses the shortcomings that we have noted in the literature.

We assume a Cobb-Douglas production function for the economy such that production at time t is given by:

$$Y_t = A_t K_t^{\propto} G_t^{\beta} H_t^{\varphi} L_t^{\theta} \qquad (1)$$

Where $\propto, \beta, \varphi, \theta > 0$ and $\propto +\beta + \varphi + \theta = 1$. Y_t is output , L_t is labour and K_t, H_t and $G_t$are the stocks of private, human, and proxy of resource endowment (oil) management at time t. it assumed in this model that the oil abundance, or the management of it as a proxy, is the only stock of public capital. In terms of labour, is assumed to be growing exogenously at rate n. according to Mankiw et al (1992), A_t is the standard term for exogenous technical progress which consists of exogenous technology and other factors that influence productivity. A_t in this model is expanded to include exogenous technical progress Tt and the level of governance GOV. it is also assumed that T grows exogenously at rate g. we assume governance to be as a functions of corruption Ct[1], and the quality of bureaucracy, Qb. We define GOV and at as;

$$A_t = T_t . GOV_t$$
$$GOV_t = f(Q_b, C_t) \qquad (2)$$

by taking the partial derivative of A_t with respect C_t, the impact of corruption on A_t is investigated as follows:

$$\frac{\partial A_t}{\partial C_t} = \frac{\partial T_t}{\partial C_t} GOV_t + \frac{GOV_t}{\partial C_t} T_t \qquad (3)$$

We assume, for simplicity, that T_t is exogenous with respect C_t, and its first derivative with respect to C_t is zero. The above equation becomes

$$\frac{\partial A_t}{\partial C_t} = \frac{GOV_t}{\partial C_t} T_t = \frac{\partial f(Q_b, C_t)}{\partial C_t} T_t = \left[\frac{\partial f}{\partial Q_b} \frac{\partial Q_b}{\partial C_t} + \frac{\partial f}{\partial C_t} \frac{\partial C_t}{\partial C_t}\right] T_t \qquad (4)$$

And

$$\frac{\partial A_t}{\partial C_t} = \left[\frac{\partial f}{\partial Q_b} \frac{\partial Q_b}{\partial C_t} + \frac{\partial f}{\partial C_t}\right] T_t . \qquad (5)$$

Equation 5 indicates the direct and indirect impact of corruption via the government channel. The term $\frac{\partial \mathrm{f}}{\partial \mathrm{C_t}}$ represents the direct impact on corruption on government, while the term $\frac{\partial \mathrm{f}}{\partial \mathrm{Q_b}} \frac{\partial \mathrm{Q_b}}{\partial \mathrm{C_t}}$ represents the indirect impact of corruption through its impact on governance via the quality of the bureaucracy. From this equation, it can be seen how any increase in theological progress $\mathrm{T_t}$, could be alleviated by corruption. it implies that, any improvement in exogenous technological progress $\mathrm{T_t}$, could be offset by either the direct impact od corruption on governance or its indirect impact on the quality of bureaucracy.

We turn now to the impact of corruption on the physical inputs of the production function. A piece of the empirical evidence presented by Tanzi and Davoodi (1998) and Everhart and Sumlinski (2001), argue that public investment is a function of corruption in line with other variables. On the other hand, some empirical studies suggest the opposite, state that corruption is positively related

to public investment. In this vein, we will not assume in prior sign on this relationship. Therefore, equation 6 can be written as:

$$G_t = i(C_t). \qquad (6)$$

Boikos (2016) suggests that corruption reduces human capital as follows: This distorts the allocation of human capital across sectors since one of the main assumptions of his model is that individuals decide on how to allocate their human capital between sectors by considering the net (from corruption) amount of public resources. If corruption affects mainly public expenditure on education, then the private sector of the economy grows and offset the possible negative effects of corruption on the accumulation of human capital. Following Boikos, we argue that human capital is also a function of corruption

$$H_t = j(C_t). \qquad (7)$$

Having specified the general functional forms for A and the inputs in the production function, we now turn to the question of what the impact of corruption on output is.

According to Mankiw et al. (1992), we assume that physical and human capital inputs in the aggregate production function are subject to decreasing scale returns, thus implying that the economy will tend toward constant private capital labour, public capital labour, and long-term human capital labour. Taking the first-order derivative of equation (1) with respect to the corruption stock, Ct, yields:

$$\frac{\partial Y_t}{\partial C_t} = \frac{\partial A_t}{\partial C_t} K_t^{\propto} G_t^{\beta} H_t^{\varphi} L_t^{\theta} + \frac{\partial K_t^{\propto}}{\partial C_t} K_t^{\propto} G_t^{\beta} H_t^{\varphi} L_t^{\theta} \frac{\partial G_t^{\beta}}{\partial C_t} A_t K_t^{\propto} H_t^{\varphi} L_t^{\theta} + \frac{\partial H_t^{\varphi}}{\partial C_t} A_t K_t^{\propto} G_t^{\beta} L_t^{\theta} + \frac{\partial L_t^{\theta}}{\partial C_t} A_t K_t^{\propto} G_t^{\beta} H_t^{\varphi}. \qquad (8)$$

Therefore, we established a theoretical model for growth that combines the influence of corruption, governance and human capital. It proposed useful ways of relationships, defined representation of the steady-state of each variable and traced the path of-steady-state and corruption may theoretically reduce public resources for various economic sectors. The distribution of human capital through industries is therefore distorted. the total impact of corruption on economic growth is negative.

CONCLUSIONS

Potentially, corruption will be raising public resources for various sectors of the economy. It causes an imbalance of human resource management across industries. The larger the spending in physical infrastructure becomes, the greater the need for fewer human capital for individuals. If corruption primarily affects the private sector, then the economy's growth rate would decline. In summarize, corruption has a detrimental effect on the development of human capital. Nonetheless, as a result, particularly though spending in physical resources will not generate opportunities for further employment, corruption will be addressed, or there would be a decrease in both human and physical capital development that would adversely impact economic growth.

A significant finding, as our conceptual model will clearly demonstrate, is that when corruption in highly corrupt nations is minimized first, attempts to increase private spending, public expenditure, or wealth endowment management and human resources can have no effect on GDP.

POLICY IMPLICATIONS

Corruption 's influence is explicitly or implicitly, or both, on almost any field of economics. However, the effect of corruption is alleviated by good governance. In the countries, where significant resources are available, the economic benefit on efforts to curb corruption is very high. The author argues that change measures would definitely pay dividends in the future. The author argues that the effect of corruption on the economy is also essential and that the conceptual framework shows the way for reform proposals.

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