Escaping From the Burdens of Growth: The Information and Communication Technologies Versus Bureaucracy

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Abstract

Besides being one of the main focus areas which economics is involved in, it is evident that the growth issue also seems to be highly open to change since the dynamics of growth convert in accordance with the requirements of the era. The current information age indicates that falling behind The Information and Communication Technologies (ICT) causes a decline in the economics as well. The studies suggesting the significance of the subject once again assert that only if it facilitates the bureaucratic practices will ICT have a direct along with an indirect contribution to the economic growth.

In the current study, the relationship of administrative requirements, bureaucracy costs and the information-communication technologies with economic growth is presented both theoretically and empirically. Covering the period between 2000 and 2011, econometric analysis was carried out by means of a panel data analysis including the BRICS countries-Brazil, Russia, India, China, South Africa- and MIST countries - Mexico, Indonesia, South Korea, Turkey. According to the empirical findings, it was found out that administrative requirements assessed within the context of business regulations have a positive relationship with growth; whereas bureaucracy costs negatively affect the economic growth. In contrast, it was obtained that the information and communication technologies have a positive effect on growth.

Key Words: BRICS, Bureaucracy, Economic Growth, MIST, The Information and Communication Technologies.

JEL Classification Codes: O30 O40, O43

Introduction

Having considering it as the basis and the best form of organization, Max Weber defines the development of bureaucracy as the inevitable element of the growth of capitalism. In addition, capitalism is the most rational economic basis for the bureaucratic management, thus ensuring its development in the most rational form. It is observed that employment is based upon technical qualifications when the basic features of a bureaucratic structure is dealt with a pro-Weber approach within the scope of such a structure supporting one another; furthermore, the main source of the rule of bureaucratic management depends on the technical knowledge which has become an indivisible whole with the development of business processes in the production of modern technology and goods (Weber, 2006: 6-8).

However, bureaucratic quality required for the formation of the relationship between management and community does not seem to progress. In terms of the administration, bureaucratic relations lead to a divergence between the interests of society and the state. This situation may occur due to several qualifications such as ability, the lack of information in management low innovation and creativity level, which refers to the development in terms of reinvention of bureaucracy (Labolo, 2013: 163). However, bureaucracy may be the cause of these shortcomings. Indeed, bureaucracy which is thought to be one of the most significant problems has a negative effect on innovation; therefore, large and complex organizations are supposed to do several changes so that they can advance both effectively and competitively.

Organizations which operate under these conditions such as severe global competition, rapid technological advancements, and resource scarcity are required to make effort in order to grow and be effective as well as surviving. Promoting innovation thus continues to be a major problem for business managers (Damanpour, 1996: 149-150). Therefore, existing structures must support innovation and technical progress.

Ionescu (2012) found out that there is a strong correlation between the three variables in the theoretical study which he examined the relationship between the quality of the bureaucracy and corporations and the competitiveness on a global scale. Meanwhile, public institutions and public systems may play a significant role in enhancing the quality of the country's economy. Nevertheless, it is pointed out that the bureaucracy in public institutions is likely to be a barrier against economic development and stability.

Bureaucracy not only serves to growth but it also supports technical competence with a pro-Weber perspective. However, it is noteworthy that the cons of the concept of bureaucracy reduce the quality of the institution and thereby causing the inadequacy of services. Besides, it is obvious that the present bureaucratic structures restrict the innovation. Moreover, the importance of bureaucratic requirements emerges as well. Thus, the fulfillment of the required arrangements properly on behalf of the authority indicates that the steps have been taken to progress. Besides, it is obvious that the information and communication technologies taking place in managerial and bureaucratic facilitation has an increasing impact upon growth. The present study considers a combination of all these effects. In this regard, the relationship of administrative requirements, bureaucracy costs and the information-communication technologies with economic growth is to be questioned for the BRICS countries-Brazil, Russia, India,

China, South Africa and MIST countries-Mexico, Indonesia, South Korea, and Turkey. Within the context of the empirical application, the correlation of these variables is tested with a panel data analysis by taking into account the period from 2000 to 2011. BRICS and MIST countries are exemplary with their economic performance, in terms of developing countries. One of the reasons for being used within the context of the study is to reveal whether there is a parallelism between the conditions of the current information age and economic growth or not. Another reason is to provide a solution through the countries which have a rapid progress in terms of growth by examining how bureaucratic obstacles and the existing administrative requirements have an impact upon growth.

1. Theoretical Explanations

When the role of bureaucracy is observed in terms of economic growth, it is found out that bureaucratically organized economic structures are found to be less effective than the structures holding free agents during the selection of the output targets and the tools used for performing them. Accordingly, it is evident that market economies have gradually exhibited much better performance. However, there is a discussion related to the main sources of disagreement. The technical impossibility of effective planning or implementation of such a plan is two of the causes of failure. Such a kind of economy develops rapidly at the first stage while slowing down later. In contrast, pro-Weber approach does not deny the reinforcing positive impact of market institutions; moreover, it assumes that bureaucratically structured public institutions are a vital complementary when it comes to the pro-market institutional arrangements made by using different decision-making procedures set. Besides, Weber discussed that public administration organizations operates with meritocratic and predictable structure and thus stating that long-term rewards will be more effective in facilitating the capitalist growth rather than the state's other forms of organization (Brixiova and Bulir, 2001:3; Evans and Rauch, 1999: 749). However, when the rebuilding process of the bureaucracy is examined, the fact that the body of rules making up its infrastructure may constitute a significant obstacle to the progress has emerged. It is widely known fact that within the context of bureaucracy, the activities of organization members have a great impact upon bureaucratic structure; however, these activities are the essence of the bureaucratic standard operating procedures and rules. Particularly, bureaucracy is *recursively reproduced* which means that it is influenced by the agreement and actions of the employees, thus being unable to put in one place (Styhre, 2007:109). Nevertheless, a rule refers to an accepted principle or instruction through which a comparison can be made; therefore, a manager is expected to make an observation and evaluation of the performance and assign a value to it as well as making comparison between the assigned value and the rule with a view to determining if the performance was decent. Thus, only if the rule is explicated qualitatively instead of quantitatively, can the administration cost be assumed to be higher (Ouchi, 1979: 835-36).

The dominant structure of the bureaucratic control adversely affects the technical features, which is one of the components of bureaucracy and hence avoiding the formation of innovation. It is clearly seen that the current set of rules belonging to the centralization and formalization has a negative effect on innovation (Damanpour, 1996: 151). In contrast, Thompson (1965) classified the structural conditions which are required for a high-capacity

organization in order to make improvements as follows (Thompson, 1965: 13): The innovative organization will be generally characterized by putting less stress on narrow, nonduplicating, nonoverlapping definitions of duties and responsibilities. The descriptions of jobs are supposed to be professional type unlike the duties type and also communications are to be much freer. Assignment and resource decisions will be much more de-centralized than is customary. The innovative organization will not be as highly stratified as existing ones as implied in the communication freedom. With the removal of innovation from the set of rules and ensuring free operation contact, it will also be possible for bureaucracy to operate for the public interest as well as enhancing the growth.

2. Overview of Literature

Labolo (2013) has greatly contributed to the literature with a study in which he revealed the positive and negative aspects of pro-Weber bureaucracy for Indonesia. On the one hand, Weber explains the negative aspects of bureaucracy as centralization, seniority, the principle (formalistic), the lack of consideration of relationships with community organizations and the characteristics of bureaucracy; on the other, he lists the positive aspects as follows: The hierarchy, a technical skill (specialization), impersonality, job clarity and job title, the creation of a system. When available pros and cons are evaluated for Indonesia, it is natural to witness the multitude of the negative sides. The problems encountered within the bureaucratic structure of Indonesia are listed as follows: First, the tendency to sustain the problem in place of solving it. Second, business of performing a self-interest activity has no longer primarily addressed to solve the problem. Third, bureaucratic trend to seek for survivors (safety player) leads to the need for escaping from problems. Fourth, the innovation which is prerequisite for the bureaucracy is deficient hence making bureaucracy to be like automation. Fifth is the weak of recruitment and promotion system. Sixth, in some cases, the expected questions will be as "what will I get" instead of "how may I help?" in terms of serving (Labolo, 2013: 164-168). This shows that the lack of innovation leads to a single-uniformization bureaucracy as well.

In the study which Faruq, et al. (2013) analyzed the impact of corruption and bureaucracy in Ghana, Kenya and Tanzania upon firm productivity, it is evident that low bureaucratic quality and corruption decrease the efficiency of company. The problem in the quality of the bureaucracy particularly stems from the loss of time. Ensuring the required documents and facing with the bureaucratic obstacles in such issues as tax and transportation affect the productivity of firm in a negative way.

In the study which Libman (2012) analyzes the influence of local political system on economic growth in terms of democracy and the size of bureaucracy in Russia (2000-2004), it is found that as the increase in the size of bureaucracy leads to a decrease in economic performance. The increase in the number of bureaucracy has been used as a variable with the aim of measuring bureaucracy in the study; therefore, it is obtained that the increase in number of bureaucratic officials is unfavorable for economic growth.

In the study which Ungureanu and Iancu (2012) examined the relationship between bureaucracy and growth for public administration in Romania, they found a negative relationship between these variables. In the mentioned study, it is evident that management system is unable to achieve the

maximum effective growth point, which means that bureaucracy does not work properly.

The study conducted by Arslan and Sağlam (2010) deals with the relationship between economic performance and bureaucracy in Turkey (1987-2007); however, it was not found a long-term relationship between these two variables. In addition, it was also not found a causal relationship between the bureaucracy and gross domestic product (GDP).

Nee and Opper (2009) has examined the relationship between financial development and bureaucratic quality on the stock-exchange market of 56 countries (2001-2003). The empirical research has revealed that bureaucratic quality is of an important determinant in the development of the financial markets. Besides, that bureaucratic quality is higher provides an efficient and improvable basis for those firms being globally competitive.

Okten (2001) has analyzed the relationship between these variables and firm investments by addressing the number of public bureaucrats as a representation of bureaucracy. Counting the number of members of the cabinet or council of ministers determines the total number of government ministries for each country. Accordingly, the ministers of state are modeled as regulators along with the common jurisdiction over firms. The discussed model shows that an increase in the number of regulators has contrary effects on the investment level of firm, which is achieved by lowering the economic growth.

Ayal and Karras (1996) tested the impact of bureaucracy upon investment and economic growth for 21 OECD countries (1960-1990). The obtained findings confirm that there is a negative correlation between bureaucracy and growth. The distinguishing point is that bureaucracy is slowing down the economic growth as well as affecting investment in a negative way.

As for the study in which Mwangi and Acosta (2013) investigated the relationship between mobile phones and growth for small firms in Kenya, it is found that this form of the communication technology has a major influence on small carriers.

Another study addressing the relationship between the information and communication technologies and growth was conducted by Ng, et al. (2012). The study tested the relationship between broadband penetration and economic growth for ASEAN countries (1998-2011); as a result, it was found that there is a positive correlation between the increase in broadband and growth. Also, another result of the analysis in the study is the fact that broadband penetration is a significant descriptive element for GDP increase.

In the study based upon the data obtained from 13 public institutions holding civil servants in the survey and performed by Paik and Kim (2012), it is determined that ICT quality affects the use of ICT and time saving. Moreover, increasing the quality of ICT in structural change in bureaucracy provides bureaucratic systems to be much more centralized. However, not only the quality of ICT but bureaucratic properties also affects the corporate events. Within the context of the effectiveness of ICT, hierarchy and bureaucratic procedures have a negative impact on time saving. In addition, bureaucratic processes influence the quality of decision-making in a negative way. Nonetheless, the technical competence of the bureaucracy increases the utilization from the system and also time saving positively. Thus, it is obvious that the effective use of ICT in the bureaucratic structure would

increase efficiency within the organization and hence offering an advantage in an economic sense.

Having analyzed the effect of information technology on the efficiency of the companies in Canada (1999-2003), in their study, Moshiri and Simpson (2011) confirms the validation of the findings which were obtained by Paik and Kim (2012). According to the obtained results, the use of computers employees has a positive and significant effect on the efficiency of the company.

Basing upon the analysis of the effectiveness of ICT-companies through the survey method including 1,000 manufacturing firms in Brazil and India, the study which was performed by Commander, et al. (2011) also supports the significance of information technology. As a result of the study, a strong positive correlation was found between ICT and productivity in both countries.

3. Data and Methodology

In the present study, the effect of administrative requirements (AREG), bureaucracy costs (BUR), and the information-communication technologies (ICT) on economic growth (GDP) has been questioned through panel data analysis method in the BRICS countries including Brazil, Russia, India, China and South Africa and MIST countries composed of Mexico, Indonesia, South Korea and Turkey. The analysis covers a 12-year period from 2000 to 2011. Since administrative requirements and bureaucracy cost data published by Fraser Institute as business regulations are appropriate for annual study for the post–2000, this period has been preferred. In the following part of the study, the process of obtaining data and calculating of them along with the methodology will be explained. At last, the obtained empirical results will be presented.

Table 1: The variables used in the study

CODE	EXPLANATIONS	SOURCES
GDP	Annual growth rate of per capita GDP (constant 2005 US$)	WDI*
BRC	This data is based on the Global Competitiveness Report question:"Standards on product/service quality, energy and other regulations (outside environmental regulations) in your country are: (1=Lax or non-existent, 7=among the world's most stringent)	EFW**
ICT	Mobile cellular subscriptions	WDI*
AREG	This data is based on the *Global Competitiveness Report* question:"Complying with administrative requirements (permits, regulations, reporting) issued by the government in your country is (1 = burdensome, 7 = not burdensome)".	EFW**

*The World Bank World Development Indicators: http://databank.worldbank.org/data/views/variable

** The Fraser Institute : The Economic Freedom of the World Annual Reports- http://www.freetheworld.com/

$$LGDP_{i,t} = \alpha_i + \beta_1 LBRC_{i,t} + \beta_2 LICT_{i,t} + \beta_3 LAREG_{i,t} + v_t + \varepsilon_{i,t} \quad (1)$$

In the models concerning the implementation (Equation 1) index i refers to countries, index t symbolizes time, α_i represents fixed country effects and v_t indicates unobservable time effect, last but not least $\varepsilon_{i,t}$ denotes the error term. The letter "L" in front of the symbols of variables shows that logarithmic transformation was done to the related variable series.

In the empirical section, the panel data analysis method which is composed of cross-sectional and time-series data has been preferred. Panel data analysis method has several advantages compared to time series analyses. Panel data analysis provides more informative data through the combination of cross-sectional observation with time series; furthermore, it makes studying meaningful via more efficient model with few multiple linearity of variables (multi co-linearity) and more degrees of freedom. In addition, panel data analysis diagnoses and measures the effects which are not observed only in cross-sectional or just in time series (Gujarati, 2001). In simple panel models defined in Equation 2, α and β coefficients do not include sub-indices with the assumption that coefficients are the same for all different individuals and time.

$$Y_{it} = \alpha_i + \beta X_{it} + u_{it} \qquad (2)$$

If a panel data has the same number of observations for each variable, it is called as a balanced panel. Panel data used in the study is balanced. The estimation to be made was performed by preferring one of the three methods which are used in simple linear panel data analyses. These methods are as follows: *Pooled ordinary least square method – POLS having* common fixed principal method, *fixed effect model- FEM* hosting country and time effects and *random effect model- REM* putting country and time difference into the model as random parameters rather than fixed parameters (Asteriou and Hall, 2007: 344-345). In the study, the tests used while making choice among the panel data analysis methods are F test (Moulton and Randolph, 1989), LM test (Breusch and Pagan, 1980) and Hausman (1978) tests. Primarily, in order to compare the presence of group specific-fixed effects (SE), common fixed and OLS, H_0 hypothesis (H_0: $\alpha_1 = \alpha_2 = \ldots = \alpha_N$) was tested. According to the hypothesis H_0, the constants belonging to the groups are equal. The method which can be applied in the event of such homogeneity will be OLS method with common fixed. The second basic tool in the choice of model is the Breusch-Pagan (1980) Lagrange Multiplier test. In this test, the null hypothesis is that the random effects variance between the units is zero (H_0: $\sigma_\mu^2 = 0$). That the rejection of the null hypothesis fails leads to the fact that random effects between units are not significant. In the absence of the effect of random panel, Pooled-OLS estimator will be preferred. Hausman (1978) test is widely used for the choice between these two estimators if unit-specific fixed and random effects are significant in F and LM tests. The main point to be considered in the separation of fixed and random effects methods is whether the elements related to individual and time is correlated with the explanatory variables in the model or not. The correlation of these elements with X_{it} refers to the fixed effects model while the absence of this correlation reveals random effects model. H_0 hypothesis shows that "there is not a correlation between the explanatory variables and unit effects". When H_0 hypothesis is accepted, both estimators will be consistent; nevertheless, as random effects estimator is much more efficient, it will be appropriate to use it.

In case of the rejection of the hypothesis H_0, as random effects estimator would be deviated, the use of consistent fixed effects estimator would be appropriate. In addition, before using the appropriate estimator, the presence of autocorrelation and the presence of the heteroscedasticity problems should be explored. In order to detect the autocorrelation in practice, Baltagi and Li (1991) LM statistic test and to detect heteroscedasticity, LMh test statistics developed by Greene (2008) were used.

4. Empirical findings

In order to determine the estimation method, F, LM, LM-Honda and Hausman tests were performed and the results are presented in Table-2 along with the results related to heteroscedasticity and autocorrelation tests. Fixed effects estimator is significant at 1% for all models compared to the POLS estimator which is pooled according to the probability values of F-test. In this case, H_0 hypothesis related to F test suggesting that fixed effects belonging to the groups are equal is rejected. On the other hand, random effect estimator is significant at the 1% compared to the estimator OLS estimator which is pooled according to the probability values of LM test. That H_0 hypothesis is rejected for LM test results in the fact that the random effects between the units are significant compared to the OLS estimator. When the random effects are examined, while H_0 hypothesis is rejected for the group effect, it cannot be rejected for time effect. According to these results, it is evident that there is random group effect but not time effect. In both tests, pooled OLS estimator is not preferred. Following this stage, a preference is to be made between fixed and random effects. According to the Hausman test probability value, H_0 hypothesis is rejected at 1% significance level. Thus, the model to be used in the study is random effects model (REM). In the analysis, the test results of the autocorrelation and heteroscedasticity (H_0: hypothesis is rejected in the both tests) shows that the problems mentioned arise for all models. Asymptotic t statistics cannot be used; instead, autocorrelation and heteroscedasticity-resistant [robust] "t" statistics (White period standard errors & covariance) were used (White, 1980-1984).

Table 2: Panel One Way Random Effect Model Estimation Results

LGDP (Dependent Variable)	**REM**
LBRC	-0.012** (0.006)
LICT	0.007* (0.003)
LAREG	0.028*** (0.007)
CONSTANT	-0.102 (0.078)
Observations	108
Num. of countries	9
F statistics	6.273
Adjusted R-Squarre	0.128

Model Selection and Diagnostic Test Results			
F-twoway_fixed	-3.805	Honda-group_random	21.14***
LM-group_random	447.23***	Honda-time_random	-0.77
LM-time_random	0.60	Honda-twoway_random	14.40***
LM-twoway_random	447.83***	Hausman	2.8448
Heteroscedasticity Tests for random effects model (H_0: No heteroscedasticity)			
LMh_random	72.12***		
Autocorrelation tests for random effects model (H_0: No autocorrelation)			
LM-murho	447.76***		
LM-mu|rho	384.25***		

Note: *** p<0.01, ** p<0.05, * p<0.1 Standard errors are in parentheses. Autocorrelation and heteroscedasticity t statistics (White period standard errors & covariance) were used.

The random effects estimation results which are performed for BRICS and MIST countries are presented in Table 2. With regard to a general evaluation model, the coefficient relevant to the bureaucracy costs which are mentioned in the study (LBRC) is observed to be negative and significant at 1%. 1% increase in LBRC variables causes 0.012 % economic decrease in mentioned countries. On the other, 1% rise in ICT variables increases the economic growth at the rate of 0.007 %. Considering LAREG variable, it was found that there is a statistically significant and positive relationship between this variable and economic growth. Compared with the other variables included in the study, it is obvious that LAREG variable contributes to the economic growth at the highest level in a positive way. Accordingly, 1% increase in LAREG variable leads to 0.28% economic growth.

CONCLUSION

The economic growth has always maintained its place among the priority issues of economy. This emphasis attributed to the growth has resulted in the analysis of several elements of these issues. In this regard, it is obvious that the arrangements and practices starting from the theoretical level ease the progression. Administrative requirements and the implementation of bureaucracy properly will provide the improvement of growth. It is highly essential to catch the era during the process of enhancing the establishment of these relationships as one of the positive contributions of bureaucracy is

the requirement for the provision of technical proficiency. However, it is still unclear whether people and organizations use the information and communication technologies sufficiently; nevertheless, the significance of ICT for the growth cannot be underestimated. Furthermore, ICT has a positive impact on growth, yet the increase in bureaucratic costs reverses this situation.

In the present study, the effect of administrative requirements (AREG), bureaucracy costs (BUR), and the information-communication technologies (ICT) on economic growth have been investigated through panel data analysis method in the BRICS and MIST countries between the years from 2000 to 2011. The obtained results confirming the literature show that an increase in bureaucracy costs have a negative effect on growth. In contrast, it is revealed that the administrative requirements and the information and communication technologies affect the economic growth in a positive way.

When the countries mentioned above are analyzed, it is found that they are not too far in terms of the level of development. This shows that with the provision administrative requirements and the channeling of the information and communication technologies to the existing functions, an increase will be achieved in the level of development. Likewise, the reduction of bureaucratic cost factors will also have a positive impact on the growth and thus providing the economic growth of the nations.

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