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RESEARCH PAPER

Corruption and Privatization: The Efficiency of Worker Cooperatives

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Abstract
The soft budget constraint tells us that because there is no strict relation between income and expenditure of state-owned firms, these firms do not have the incentive to increase their efficiency. The solution to this is privatization. However, because privatization creates opportunities for corruption, we see the reproduction of the soft budget constraint. Here, we articulate privatization as a principal-agent model. The principal may transfer public assets to three types of agents: corrupt, not corrupt, and worker cooperative. The characteristics of the worker cooperative agent are ascribed to the standard model of efficiency wage. The result is that the rate of cronyism was lower when the worker cooperative agent was introduced. This observation suggests that while the privatization to worker cooperatives cannot diminish corruption, it decreases corruption substantially. Furthermore, we also see that the efficiency of worker cooperatives is higher than investor-owned firms. The important conclusion from our study is that the corruption of privatization is partially for overcoming the incomplete information about the agents (new owners), and it is from this point that privatization to worker cooperatives can curb corruption. The higher efficiency of worker cooperatives compensates for incomplete information. We propose the privatization of worker cooperatives instead of investor-owned firms.
Keywords: Privatization, Worker Cooperatives, Investor-Owned Firms, Corruption.
JEL Classification: J54, D21.

Introduction

Why should economies privatize? There are several definitions for privatization, but it is defined as the transfer of public assets to private individuals or the transfer of the right to control the cash flow of any public assets (Kaufmann and Siegelbaum, 1997). Several arguments favor privatization (e.g., optimum resource allocation by price system in free markets). However, one of the fundamental reasons made for privatization, called "Soft Budget Constraint", states that even if state-owned firms are vested with a moral and financial interest in maximizing their profits (i.e., state-owned firms follow price systems), the loss-makers among them are not allowed to fail. They will always be bailed out with financial subsidies or other instruments (Kornai et al., 2003). That is why the managers of state-owned firms do not have an incentive to decrease costs and increase the firm's efficiency. In this manner, privatization is a remedy because private firms have a hard budget constraint. This function of privatization can be undermined by corruption. This is the point that we are focusing on, the failure of privatization because of corruption.

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Corruption is the abuse of public office for private gain (Aidt, 2003). We call it cronyism whenever it leads to the appointment of friends or associates to positions of authority, unregarding their qualifications (Khatri et al., 2006). We will provide a formal definition of the term later in section 2. Cronyism can avoid the establishment of hard budget constraints. This impact of cronyism means that the success or failure of privatization depends on whether it can control corruption. If corruption increases during privatization, privatization cannot deliver the benefits that it ought to achieve, namely the eradication of soft budget constraints. There are clear examples to confirm this fact (Mazumdar, 2008; Wedeman, 2003; Rock and Bonnett, 2004; Harriss-White, 1996).

Initially, it was thought that privatization could deter corruption immediately. The argument was straightforward; the less governments have access to markets and intervene in the economy, the fewer there would be opportunities for making corrupt transactions (World Bank, 1997). Nevertheless, when authors empirically investigated the relationship between privatization and corruption and see how well privatization has been able to manage and control corruption, overwhelming studies found that privatization coincides with a dramatic increase in the level of corruption as if there is an inherent relationship between privatization and corruption (Arikan, 2008; Reinsberg et al., 2020); from Europe and former soviet countries(Rose-Ackerman, 2007) to Vietnam and China (Hao and Johnston, 1995) and Latin America (Martimort and Straub, 2009). This observation begs us to ask why privatization increases corruption and how it can be avoided.

The vast majority of researchers have considered the speed of privatization as one of the main explaining factors of the corruption increment (Havrylyshyn and McGettigan, 2000). On the one hand, proponents of "rapid privatization" or "spontaneous privatization" argue that slow privatization can allow bureaucrats to construct corrupt and illegal relations with new owners. Instead, rapid privatization will create a new class of owners who will demand the creation of necessary institutions in protecting private property and the rule of law (Shleifer and Vishny, 1994). On the other hand, proponents of "slow privatization" or "gradual privatization" believe that the subsequent legal and institutional reform after privatization cannot spontaneously emerge because utility expectancy from weak legal institutions and the absence of the rule of law can surpass any incentive for reforms (Hoff and Stiglitz, 2005). Alternatively, to put it simply, the absence of the rule of law can also benefit those called "asset strippers".

From the empirical point of view, there exists support for both rapid (Djankov and Murrell, 2002) and slow privatization (Godoy and Stiglitz, 2007). These observations caused the new line of research to dismiss this dichotomy of speed and argue that there must be other key explaining factors such as privatization methods or, even more importantly, the incentive mechanism of the principal responsible for the privatization of state-owned firms (Popov, 2000). We will keep our focus on the incentive mechanism of the principal, and we will neglect the role that the method of privatization can play. We do so because out of the three main methods of privatization: voucher-based mass, government debt compensation, and tenders or trade sales (Kaufmann and Siegelbaum, 1997), None of them seem to contribute to the variety in the level of corruption substantially (Hoen, 1996).

Moreover, Poland is one of the essential countries that most authors agree that it successfully privatized (Amess and Roberts, 2007). However, there is no general agreement on the speed of privatization. This controversy is because of the peculiar path that this country went through to privatize state-owned firms (known as "en masse privatization"). Poland was the first state that separated from the Soviet Union. The privatization of Poland took place in three steps. First, from 1983 mass movement ("Solidarnosc") forced the state to relinquish its control over firms and allow them to work privately as worker cooperatives until 1991. Then in the second step, these worker cooperatives were nationalized in order to transform these

worker cooperatives into investor-owned firms in 1993 (Windolf, 1998). By pointing out the years leading to 1993, some authors claim that Poland's privatization was rapid (Marangos, 2005). However, others, emphasizing the period of 1983 to 1991, claim that Poland's privatization was slow (Hoff and Stiglitz, 2005).

In this article, we consider the case of privatization in Poland from the perspective of the incentive governing the privatizing principle. Our main questions are: Can privatization to worker cooperatives be a viable solution for successful privatization instead of privatization to investor-owned firms? Can it avoid corruption and consequently eradicate the problem of soft budget constraint? In order to find the answer to our questions, we organized the paper in the following manner: a worker cooperative model based on the Stieglitz model of efficiency wage (Shapiro and Stiglitz, 1984) is presented in section 2.1. Then we articulate privatization as a principal-agent model. We provide a formal definition for the rate of cronyism in section 2.2. We measure changes in the rate of cronyism for privatization with and without worker cooperatives as a viable option, and we present our results in section 3. Finally, section 4 concludes.

Method

Model of Worker Cooperatives

In our worker cooperative, there are N number of laborers L deciding for t number of periods with discounting rate. Each laborer can decide to be in one of three possible states: they can be employed and do not shirk or they can be employed but shirk, and finally, they can be unemployed. Our goal is to determine under what circumstances laborers would prefer not to shirk in a worker cooperative and compare it with the condition in which they prefer to do the same in an invested-owned firm.

In the not shirking statev_c, each one of the *NL* laborers put e amount of effort as their cost and instead they earn an average amount of production $Af\ (e;\ N\ L)$. In addition, they can end up being unemployed with the probability *b*.

$$\rho v_c = \frac{A\ f(e;\ N\ L)}{N\ L} - e - b\ (v_c - v_u) \tag{1}$$

If they decide to shirk v_s then they would earn average production minus their contribution mp_l - marginal product of labor. However, the chance of getting caught q increases the probability of being unemployed, $p + q$.

$$\rho v_s = \frac{A\ f(e;\ N\ L) - mp_l}{N\ L} - (b + q)\ (v_s - v_u) \tag{2}$$

Lastly, if they are unemployed v_u they might fill a vacancy with the probability *a*.

$$\rho v_s = a\ (v_n - v_u) \qquad v_n = max\ \{v_c, v_s\} \tag{3}$$

Lemma (Worker Cooperatives' No Shirking Condition (NSC)): A member of worker cooperative do not shrink if and only if $\frac{Af(e)}{N\ L} \geq \bar{e} + (\rho + a + b)\ \frac{\bar{e} - \frac{mpL}{N\ L}}{q}$.

Proof. Since NSC requires that $v_c \geq v_s$, it implies:

$$\frac{A\ f(e;\ N\ L)}{N\ L} - e - b\ (v_c - v_u) \geq \frac{A\ f(e;\ N\ L) - mp_l}{N\ L} - (b + q)(\ v_c - v_u) \tag{4}$$

which is equivalent to:

$$(v_c - v_u) \geq \frac{\bar{e} - \frac{mp_l}{N\ L}}{q} \tag{5}$$

In addition, the left-hand side of (5) can be derived by subtracting (3) from (1):

$$(v_c - v_u) = \frac{\frac{A f(e)}{N L} - \bar{e}}{\rho + a + b} \tag{6}$$

by substituting (5) into (6) and rearranging then NSC becomes:

$$\frac{Af(e)}{L} \geq \bar{e} + (\rho + a + b)\frac{\bar{e} - \frac{mpL}{NL}}{q} \tag{7}$$

Theorem Worker cooperatives are more efficient than investor-owned firms are, and they are socially optimum.

Proof. Recall Stiglitz's model of efficiency wages, the NSC of laborers in the investor-owned firm was;

$$w \geq \bar{e} + (\rho + a + b)\frac{\bar{e}}{q} \tag{8}$$

By comparing the two NSCs (7 and 8) proof is complete.

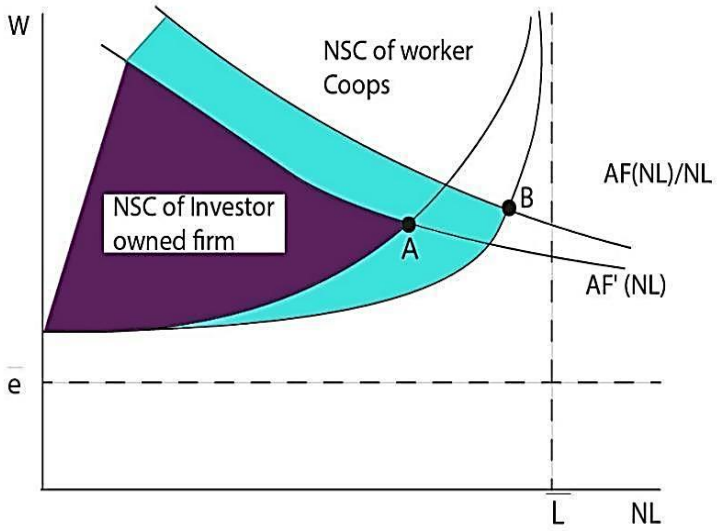

Figure 1. Comparing the Equilibrium of Investor-Owned Firms and Worker Cooperatives with Considering No Shirking Condition
Source: Shapiro and Stiglitz, 1984, Research proof.
Note: Point *A* Is the Equilibrium of Invested Owned Firms and *B* Is the Equilibrium for Worker Cooperative

Privatization and Rate of Cronyism

In our model of privatization, the principal faces three candidate agents. The principal should decide for each public asset an owner between the three types. Agents types are: known agent, who is familiar to the principal (Crony investor-owned firm option), unknown agent (non Crony investor-owned firm option) and last agent is representative of the employed laborer with the public asset (worker cooperative option). The expected utility of principal is equal to *V* amount of benefit for each period time *t* by the discounting rate from successful privatization, meaning that our principal is benevolent and he cares about the firm. The probability of successes are r_k for the known agent (9), r_u for unknown (10), and r_c for the laborer's representative (11) which are between zero and one. Moreover, for the known agent there is an extra ϵ amount in the first period capturing any possible bribery or kickbacks from the known agent to the official; A parameter for *political impulsiveness*. These expected utilities are as follows:

$$Eu(known) = \int_0^{\infty} \rho^t r_k V\, dt + \epsilon \quad (9)$$

$$Eu(unknown) = \int_0^{\infty} \rho^t r_u V\, dt \quad (10)$$

$$Eu(coop) = \int_0^{\infty} \rho^t r_c V\, dt \quad (11)$$

Based on theorem (2.1) $E(r_c) \geq E(r_k) = E(r_u)$ (chance of success is higher for worker cooperatives) and their standard deviations are $\sigma(r_c) = \sigma(r_u) \geq \sigma(r_k)$ that is, for the principal, the known agent is less risky than others. This is because the principal has more prior knowledge about the known agent than other agents do.

In Table 1, the first stimulation (top) agents are pulled from r_u ~ N(0.6, 0.02), r_k ~ N(0.6, 0.01), r_c ~ N(0.65, 0.02) And in the second (bottom) they are pulled from r_u ~ N(0.5, 0.5), r_k ~ N(0.5, 0.0001), r_c ~ N(0.5001, 0.5). The first column is the principal's discounting factor, the second column is the amount of bribe that the principal receives from the agent with the type known, and the third and fourth column are the rate of cronyism before and after (respectively) the introduction of cooperative agents to the stimulation.

Table 1. The Impact of Worker Cooperatives on the Rate of Cronyism in Varying Levels of Discount Rate and Bribe

Discount rate	Bribe	Cronyism before	Cronyism after
0.5	10%	0.74	0.06
0.9	10%	0.66	0.02
0.5	30%	1.00	0.62
0.9	30%	0.91	0.19
0.5	10%	0.53	0.16
0.9	10%	0.52	0.16
0.5	30%	0.55	0.18
0.9	30%	0.53	0.16

Source: Research finding.

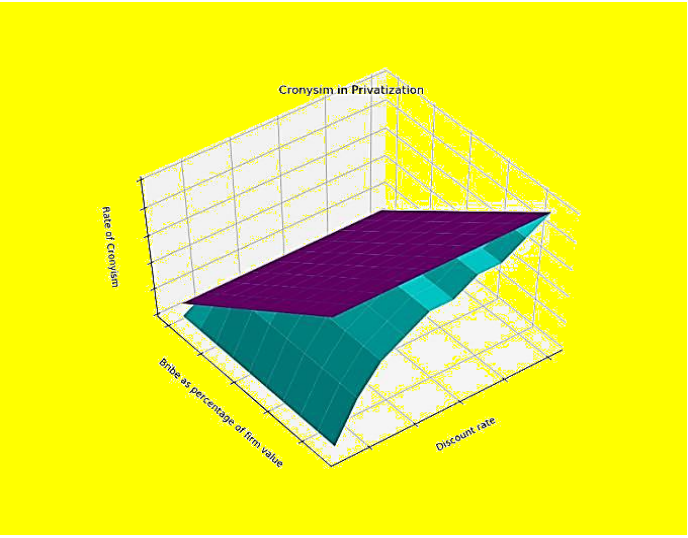

Figure 2. Comparing the Rate of Cronyism with and Without the Presence of Worker Cooperatives
Source: Research finding.

In Figure 2, the darker sphere is the rate of cronyism in the absence of worker cooperatives and the lighter sphere is in its presence, causing decrements in the cronyism rate. In this experiment agents are pulled from r_u ~ N(0.6, 0.02), r_k ~ N(0.6, 0.01), r_c ~ N(0.65, 0.02). Higher discount rate ρ and lower bribe ϵ result in a lower Cronyism rate.

Results

The worker cooperative cannot ensure not shirking in full employment, because $\frac{mp_l}{N\,L}$ tend to zero as NL goes to infinity, which captures the free-riding problem. Nonetheless, because of workers' sensitivity about overall production in worker cooperatives, they do a better job than investor-owned firms do. Meaning the members are willing to get less for not shirking.

This fact serves two critical results: first, the free-riding problem is *less* detrimental than the shirking problem, and second, because worker cooperatives can efficiently use more labor than investor-owned firms can.

The result of our experiment (Figure 2) is that the Rate of Cronyism, ω defined as number of firms assigned to known agent over total number of privatized firms is less in the presence of worker cooperative as an option to principal for all combination of $\omega(V, \rho, \epsilon, t)$.

Conclusion

One of the essential reasons for privatization is the eradication of soft budget constraint, the phenomenon that firms can avoid losses and escape bankruptcies with the help of states and, in consequence, lose the incentive to increase productivity. One obstacle that privatization can be trapped into is corruption. When new owners have crony relations with state officials, the firms will still have a soft budget constraint. That is why corruption is significant in the context of privatization. It can determine the success of privatization. Based on empirical studies, there seemed to be inherent relation between privatization and corruption. Privatization provides crony opportunities.

In the literature, there are two sides for protecting privatization; one side favors rapid privatization, fast transfer of ownership, and the subsequent emergence of appropriate institutions. Another side favors gradual privatization, first strengthening legal institutions then transferring property rights to private individuals. The empirical investigations have not been able to conclusively rule for either side of the debate due to a lack of reliable data regarding corruption (Pena et al., 2019). The success story of polish en masse privatization, privatization to worker cooperatives inspired us to create a general framework of privatization, but in order to do so, we needed first to construct a model of worker cooperatives.

We find three incentives governing members of worker cooperatives: The first one is income: Members know that if they work harder, they earn more. The second one is peer control: Members know that they will earn more if their peers work harder. In addition, the last one is the free-riding problem**:** Members know that if their peers work harder, they can work less. From these points, we conclude that the shirking problem of investor-owned firms is worse than the free-riding problem of worker cooperatives (Figure 1), and we think this is why worker cooperatives outperform investor-owned firms (Perotin, 2016; Burdin and Dean, 2009) and more resilient against crises (Roelantset et al., 2012; Billiet et al., 2021).

Next, when we implement the above conclusions to our principal-agent privatization model, we find that the rate of cronyism decreases due to changes in three parameters. The first one is the principal's discount rate: If the principal has higher patience and values future outcomes more, the rate of cronyism decreases. One can further assume that the stability of a country increases the discount rate and consequently decreases cronyism. We encourage future work on the relation of country stability and corruption during privatization.

The second parameter is bribe**:** bribe increases the rate of cronyism. However, the impact is

modulated by the principal discount rate, and it works as a measure of the principal political impulsiveness. Bribe causes greater changes in the rate of cronyism when the discount rate is low.

The third parameter is incomplete information: Most interestingly, we find that even when the principal is benevolent; it still has the incentive to be crony. The reason is that cronyism can function as a solution to ensure that the firm's new owner is reliable. I.e., by being crony, the principal avoids more risky choices.

The changes in the rate of cronyism can provide us with insight into the relationship between corruption during privatization and post hoc market concentration (Bjorvatn and Sbreide, 2005). We encourage further research on this topic.

Considering all the points mentioned above to increase efficiency and avoid corruption of privatization, we recommend privatization of state-owned firms to worker cooperatives instead of investor-owned firms, a policy that has shown its effectiveness in the few places that have been applied (Douvitsa and Kassavetis, 2014).

References

[1] Aidt, T. S. (2003). Economic Analysis of Corruption: A Survey. *The Economic Journal*, *113*(491), F632-F652.

[2] Amess, K., & Roberts, B. M. (2007). The Productivity Effects of Privatization: The Case of Polish Cooperatives. *International Review of Financial Analysis*, *16*(4), 354-366.

[3] Burdin, G., & Dean, A. (2009). New Evidence on Wages and Employment in Worker Cooperatives Compared with Capitalist Firms. *Journal of Comparative Economics*, *37*(4), 517-533.

[4] Dannenberg, P., Fuchs, M., Riedler, T., & Wiedemann, C. (2020). Digital Transition by Covid-19 Pandemic? The German Food Online Retail. *Tijdschrift Voor Economische en Sociale Geografie*, *111*(3), 543-560.

[5] Douvitsa, I., & Kassavetis, D. (2014). Cooperatives: An Alternative to Water Privatization in Greece. *Social Enterprise Journal*, Retrieved from https://www.emerald.com/insight/content/doi/10.1108/SEJ-10-2013-0039/full/html

[6] Fossati, F., & Trein, P. (2020). Support for Surveillance, Re-Nationalization and Prevention during Times of Crisis. A Cultural, Ideological, or Personal Matter? Retrieved from https://www.researchgate.net/

[7] Godoy, S., & Stiglitz, J. E. (2007). Growth, Initial Conditions, Law and Speed of Privatization in Transition Countries: 11 Years Later (89-117). In S. Estrin, G. W. Kolodko, and M. Uvalic (Ed.), *Transition and Beyond*. London: Palgrave Macmillan.

[8] Havrylyshyn, O., & McGettigan, D. (2000). Privatization in Transition Countries. *Post-Soviet Affairs*, *16*(3), 257-286.

[9] Hao, Y., & Johnston, M. (1995). China's Surge of Corruption. *Journal of Democracy*, *6*(4), 80-94.

[10] Harriss-White, B. (1996). Liberalization and Corruption: Resolving the Paradox (A Discussion Based on South Indian Material). *IDS Bulletin*, *27*(2), 31-39.

[11] Hoen, H. W. (1996). "Shock Versus Gradualism" in Central Europe Reconsidered. *Comparative Economic Studies*, *38*(1), 1-20.

[12] Hoff, K., & Stiglitz, J. E. (2005). The Creation of the Rule of Law and the Legitimacy of Property Rights: The Political and Economic Consequences of a Corrupt Privatization. *The World Bank, Working Paper, 11772*, Retrieved from https://www.nber.org/system/files/working_papers/w11772/w11772.pdf

[13] Kaufmann, D., & Siegelbaum, P. (1997). Privatization and Corruption in Transition Economies. *Journal of International Affairs*, *50*(2), 419-458.

[14] Kornai, J., Maskin, E., & Roland, G. (2003). Understanding the Soft Budget Constraint. *Journal of Economic Literature*, *41*(4), 1095-1136.
[15] Marangos, J. (2005). A Political Economy Approach to the Neoclassical Gradualist Model of Transition. *Journal of Economic Surveys*, *19*(2), 263-293.
[16] Martimort, D., & Straub, S. (2009). Infrastructure Privatization and Changes in Corruption Patterns: The Roots of Public Discontent. *Journal of Development Economics*, *90*(1), 69-84.
[17] Simeon, D., & Murrell, P. (2002). Enterprise Restructuring in Transition: A Quantitative Survey. *Journal of Economic Literature*, *40*(3), 739-792.
[18] Mazumdar, S. (2008). Crony Capitalism and India: Before and After Liberalization. *MPRA*, Retrieved from https://mpra.ub.uni-muenchen.de/19627/
[19] Perotin, V. (2016). What Do We Really Know About Workers' Co-Operatives? In *Mainstreaming Co-Operation*. Manchester: Manchester University Press.
[20] Popov, V. (2000). Shock Therapy versus Gradualism: The End of the Debate (Explaining the Magnitude of Transformational Recession). *Comparative Economic Studies*, *42*(1), 1-57.
[21] Arikan, G. G. (2008). How Privatizations Affect the Level of Perceived Corruption. *Public Finance Review*, *36*(6), 706-727.
[22] Reinsberg, B., Stubbs, T., Kentikelenis, A., & King, L. (2020). Bad Governance: How Privatization Increases Corruption in the Developing World. *Regulation & Governance*, *14*(4), 698-717.
[23] Rock, M. T., & Bonnett, H. (2004). The Comparative Politics of Corruption: Accounting for the East Asian Paradox in Empirical Studies of Corruption, Growth and Investment. *World Development*, *32*(6), 999-1017.
[24] Rose-Ackerman, S. (2007). *International Handbook on the Economics of Corruption*. Cheltenham: Edward Elgar Publishing.
[25] Bjorvatn, K., & Søreide, T. (2005). Corruption and Privatization. *European Journal of Political Economy*, *21*(4), 903-914.
[26] Shapiro, C., & Stiglitz, J. E. (1984). Equilibrium Unemployment as A Worker Discipline Device. *The American Economic Review*, *74*(3), 433-444.
[27] Shleifer, A., & Vishny, R. W. (1994). Politicians and Firms. *The Quarterly Journal of Economics*, *109*(4), 995-1025.
[28] Roelants, B., Dovgan, D., Eum, H., & Terrasi, E. (2012). *The Resilience of the Cooperative Model*. Brussels: CICOPA.
[29] Wedeman, A. (2003). Development and Corruption: The East Asian paradox (50-77). In *Political Business in East Asia*. London: Routledge.
[30] Bank, W. (1997). *Helping Countries Fight Corruption: The Role of the World Bank*. Washington, DC: World Bank Group
[31] Billiet, A., Dufays, F., Friedel, S., & Staessens, M. (2021). The Resilience of the Cooperative Model: How Do Cooperatives Deal with the COVID-19 Crisis? *Strategic Change*, *30*(2), 99-108.
[32] Windolf, P. (1998). Privatization and Elite Reproduction in Eastern Europe. *European Journal of Sociology*, *39*(2), 335-376.
[33] Pena, M. N., & Cuadrado-Ballesteros, B. (2019). Is Privatization Related to Corruption? An Empirical Analysis of European Countries. *Public Management Review*, *21*(1), 69-95.
[34] Khatri, N., Tsang, E. W., & Begley, T. M. (2006). Cronyism: A Cross-Cultural Analysis. *Journal of International Business Studies*, *37*(1), 61-75.