Spatial Spillover of Governance and Institutional Quality: A Spatial Econometric Approach

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ABSTRACT

The failure of Washington consensus increased the attention of researchers and policymakers on improving institutional quality of countries. Different empirical studies have been done to find determinants of institutional quality especially at global scales. This paper represents a complementary approach on previous efforts by developing spatial spillover of governance as a determinant of institutional quality. In fact, this paper attempts to answer to the question: how much can the institutional quality of neighboring countries explain good governance of a country and what is the share of this variable among the other determinants? To answer these questions, spatial econometric approach is adopted. Paper reveals that spatial governance spillover can explain about 20% of governance quality of countries and consequently is one of the serous determinants of institutional quality when the concept of contiguity gets wider than land borders.

JEL Classification: C31; C52; H11

Keywords: Institutional quality; Governance spillover; Spatial econometrics

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I.   Introduction

Since the WWII, at least three phases of development policy have been experienced. In the first phase of post-war development policy, until the 1970s, development was basically equated with economic growth (Frey, 2008). Economic development and technological progress were the crucial conditions for bringing the countries of the South onto the development path of the North (Mestrum, 2006). The main development theory of that era, i.e., trickle-down theory, suggested that lack of investment capital is the main shortcoming of development policy that should be overcome by capital imports from abroad (Fox and Brown, 1998).

Emergence of economically questionable megaprojects with loads of social and environmental costs, in addition to failure of the other Keynesian macroeconomic policies, significantly changed the development strategies of countries and shifted them to 'Washington consensus' in the end of 1970s and 1980s. The cornerstones of the second phase of development were macroeconomic stabilization, trade liberalization, deregulation and privatization (Frey, 2008). In such context, the role of government declined dramatically and private sector was proposed as the substitution of the public sector. Although these policies have in some cases proved useful in promoting higher levels of economic growth, their applications and effectiveness have been often doubted by adverse circumstances generally referred to as 'inadequate institutional conditions'. Consequently, development analysis has moved beyond this set of policy recommendations, looking to a third way (Stiglitz, 2003) and taking to integrate institutions into the development equation (Straub, 2000).

Governance, institutions and institutional quality are the terms used interchangeably and sometimes imprecisely to show the rules, enforcement mechanisms and organizations of countries (World Bank, 2002)[1]. The literature on the role of institutions in the process of development gives different meanings to the term 'governance'. Kersbergen and

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[1] In this paper, these words are also used alternately.

Waarden (2004) reviewed nine different definitions of governance. An early and narrow definition of public sector governance proposed by the World Bank is that "governance is the manner in which power is exercised in the management of a country's economic and social resources for development" (World Bank, 1992: 1). This definition remains almost unchanged in the Bank's 2007 governance and anticorruption strategy, with governance defined as the manner in which public officials and institutions acquire and exercise the authority to shape public policy and provide public goods and services (Kaufmann and Kraay, 2008). Under the Worldwide Governance Indicators (WGIs) research project, Kaufmann et al. (2004, 2009) define governance broadly as the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of governments to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them.

The literature on institutions can be divided into two broad categories. The first is mainly concerned with the way the quality of institutions affects economic and social outcomes. The second category studies the determinants of institutional quality and answers to the question that why the quality of institutions varies across countries. Although researchers paid much attention to the first category, the latter is extremely interesting from a policy point of view (Straub, 2000). This paper is a complementary to the latter researches in the sense that tries to develop a recently proposed determinant of institutional quality, i.e., spatial spillover of governance. This paper answers to the following questions: how much institutional quality of neighboring countries can explain good governance of a country and what is the share of this variable among the other determinants. To answer these questions, spatial econometric approach is adopted. Paper reveals that spatial governance spillover can explain about 20% of governance quality of countries and consequently is one of the serious determinants of institutional quality when the concept of contiguity gets wider than land borders.

The paper consists of five sections. Section 2 explains the previous findings about the

determinants of institutional quality. Section 3 explains the concept and empirical studies about the spatial spillover of governance. Section 4 includes explanations about the methodology, data, and structure of the model. Section 5 tries to interpret the results and the final section concludes and proposes some policy implications.

II.   Determinants of institutional quality: literature review

It is widely accepted that factor accumulation and technological change solely cannot explain the differences in growth performance across countries (Islam and Montenegro, 2002). Economic development requires an institutional framework that supports a market economy including two distinct sets of institutions: (i) those that foster exchange by lowering transaction costs and encouraging trust, and (ii) those that influence the state and other powerful actors to protect private property and persons rather than expropriate and subjugate them (Shirely, 2008). Several studies can be found including theoretical studies, cross country analysis and historical case studies focusing on the impact of institutional quality of countries on economic, social and environmental development through protection of property rights, incremental of bureaucracy quality, empowerment of rule of law and control of the level of corruption (North, 1993, 1994; Engerman and Sokoloff, 2002; Gradstein, 2004; Dasgupta et al., 2006; Sharma, 2007; Hooper et al., 2009).

On the other hand, the other category of studies addresses the importance of institutions in the process of development, and investigates the determinants of institutional quality especially in global coverage. In a general classification, significant explanatory variables of good governance can be grouped in economic, social, political/historical and geographical categories. The most important economic determinants of institutional quality are the development level and trade intensity of countries. Alonso and Gracimartin (2009) believe that development level is identified as one of the first cleared explanatory variables, operates on institutional quality through both supply and demand. First, it determines the availability of resources to build good

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institutions. Second, it generates a larger demand for quality of institutions. The positive relationship between both variables has been confirmed by many researches (Chong and Zanforlin, 2000; Islam and Montenegro, 2002).

Some studies like Ades and DiTella (1999) found that high trade intensity (measured as the share of imports or imports + exports in GDP) associates with lower corruption levels. Contradictory to this finding, researchers like Knack and Azfar (2003) believe that the relationship between corruption and trade intensity is sensitive to sample selection and disappears by using newer corruption indicators with substantially increased country coverage. In addition to the mentioned ones, some variables like unemployment rate, budget deficit and exchange rate are also defined as economic determinants of good governance (Chaudhry et al., 2009). According to the above studies, stable and open economy with a high growth rate is the economic precondition of institutional development.

Social variables interesting for researchers are population, inequality, ethnic composition, education and finally beliefs and norms. Jalan (1982) suggests that smaller nations benefit from greater social cohesion and fewer vested interests, making it easier to effectively adapt policies to new challenges. Furthermore, higher population is significantly associated with more corruption. Fisman and Gatti (2002) conjecture that in large countries, which may have fewer government officials per citizen – due to economies of scale – citizens may be tempted to bribe officials to jump the queue. On the other hand, Knack and Azfar (2002) believe that the relationship between corruption and country size weakens or disappears using samples less subject to selection bias.

Economic inequality affects both institutional predictability and legitimacy. First, strong inequality causes divergent interests among different social groups, leads to conflicts, socio-political instability and insecurity. Second, inequality facilitates institutions remaining captured by groups of power, whose actions are oriented to particular interests rather than to the common good. Third, it diminishes social agents' disposition to cooperative action and favors corruption and rent-seeking activities

(Alesina and Rodrik, 1993; Easterly, 2001; Alonso and Garciamartin, 2009).

Easterly and Levine (1997) find ethnic diversity to be a significant determinant of poor policies, weak institutions and low growth both in Africa and in worldwide cross sectional regressions. La Porta et al. (1999) also find the ethnic heterogeneity is associated with poorer institutional quality. But Islam and Montenegro (2002) and Siba (2008) prove that ethnic fractionalization does not significantly explain variations in institutional quality.

Education is the other social variable that affects institutional quality. While corruption reduces average income and education, education increases not only output and hence potential rents, but also produces more informed electorates that better monitor government actions. Alesina and Perotti (1996) and Rauch and Evans (2000) confirm the positive impact of education on institutional quality. Eicher et al. (2009) find that economies with intermediate levels of education remain in a poverty trap since the level of skills creates sufficient corruption rents but not enough monitoring. Only economies with low or high levels of education can escape the poverty. Finally, norms and beliefs which are inhospitable to markets or trust prevent countries from building institutions to encourage trade and investment (North, 1994; Knack and Keefer, 1997; Shirley, 2008).

Various political/historical variables are defined as determinants of institutional quality which are colonial heritage, colonial heritage plus and political variables (Shirley, 2008). Colonial heritage theories suggest that colonized countries inherit poor institutions from their colonial masters (North, 1990). Some researchers argue that a specific aspect of colonial heritage which is the common or civil law system has a profound effect on a country's current institutions. Countries with civil law origins, particularly French civil law, developed a state more prone to threatening property rights, establishing monopolies and suppressing innovation, and provided less protection for minority shareholders (La Porta et al., 1998, 1999; Chong and Zanforlin, 2000). Berkowitz et al. (2002) suggest that how a legal system was initially received – whether through conquest, colonization, or imitation – may have more influence on how it functions today than it is French, German,

British or Scandinavian. Colonial heritage plus studies argue that the types of institutions Europeans imposed in their colonies depended on the conditions they found there. In richer areas with large population (as free labors (slaves)) or appropriate climates, colonizers concentrated political power in the hands of a few who used it to extract resources from the rest of the people (Acemoglu et al., 2001).

Political variables which explain good governance are political conflict and political system. Some scholars argue that it is not colonization that is responsible for weak institutions but too little political conflict of the sort that led elites in Western Europe to make compromises and build institutions to win supporters, raise revenues and defeat foreign enemies (Shirley, 2008). Sunde et al. (2008) find that democracy is only associated with better rule of law when inequality is lower.

The last set of variables is related to geographical conditions. Olsson (2005) categorizes implicit and explicit geographical explanatory variables into four aspects which are climate, topography, geology and biogeography. Most of researchers have concentrated on geological aspect especially the natural resource wealth of countries. Gallup et al. (1999) believe that two geographical correlates of economic development are unmistakable. First, the countries in the geographical tropics are nearly all poor. Almost high income countries are in the mid and high latitudes. Second, coastal economies feature generally higher income than the landlocked economies. Wei (2000) proves that naturally more open economies do exhibit less corruption even after taking into account their levels of development. Residual openness – which potentially includes trade policies – was found not to be important once natural openness is accounted for. The Olsson and Hibbs (2005) study reveal that the effects of geography and biogeography on contemporary levels of economic development are remarkably strong.

Studies about the impact of natural resources on economic and institutional development are investigated in natural resource curse theory. While Sachs and Warner (1995) found a negative association between natural resource abundance and growth in the large cross-country study, most of current studies reveal that cursing the natural

resources depends on the quality of institutions when the huge revenues of resources streamed to countries. Low initial institutional quality in addition to huge resource revenue have created a recursive cycle that led these countries to higher natural resource dependence and inevitably more rents and lower institutional qualities (Bulte et al., 2005; Mehlum et al., 2006; Brunnschweiler, 2008; Brunnschweiler and Bulte, 2008; Stevens, 2008)

III.   Spatial spillover of governance

The other geographical determinant which was not studied and investigated broadly is spatial spillover of governance quality on neighboring countries or countries located in the same region. Many countries can be found that in spite of lacking previous conditions could increase the quality of their institutions. For instance, although some countries like Switzerland are landlocked, they are developed economically and institutionally. Spatial spillover which is a known effect in regional sciences can fill this gap. Geographical entities are affecting each other not only trough time, but also via their locations (Dubin, 1998). The power of this effect that can be measured by spatial autocorrelation is affected by distance of entities. This is in accordance of Tobler (1970) first law of geography that everything is related to everything else, but near things are more related than distant things. Countries as spatial entities are following this rule.

Leeson and Dean (2009) describe spatial spillover of institutions as what U.S. president Eisenhower called 'the falling domino principle': knocking over the first domino in a row of dominoes makes all of them fall continuously. They use the same idea for proposing 'democratic domino theory' that changes in one country's political institutions spread to neighboring countries, affecting these countries' political institutions similarly and this process continues. The result is greater or lower quality of institutions regarding the quality of the first impact. Therefore war and terrorism can decrease governance quality of countries in the same region and changing in a governing

system from autocracy to democracy, mitigating the corruption or increasing the rule of law in a country can improve governance quality of others.

Simmons, Dobbin and Garrett (2006) identify four potential mechanisms or channels for spatial institutional spillover. The first channel is simple Tiebout competition. Competition between governments to attract additional foreign business and direct investment can create greater incentives for geographic neighbors to increase democratic constraints, leading prodemocracy changes to spread throughout geographic regions. The second potential mechanism of institutional spillover is learning. Neighboring countries can observe the activities of the countries around them and improve successful ideas at a lower cost than if they had to look further abroad to find them. The third mechanism is spatial institutional spillover through economic communities and zones. Several economic communities constrain their members to improve their institutions directly or they increase the level of economic freedom in their members' economies that finally leads to improvement of institutions in an indirect way. Emulation is the final potential mechanism that Simmons, Dobbin and Garrett highlight. Emulation is a non-geographic mechanism in the sense that some 'big player' countries, such as United States, lead in terms of potential institutions (and policies) and then, other countries follow.

In addition to the above mechanisms, some other channels have been proposed. As Eichengreen and Lebang (2006) believe, democracy and globalization go hand to hand. Parallel trends in the direction of political democratization and economic globalization in the last quarter of 20th century is an undeniable evidence for it. The exchange of goods and services is a conduit for the exchange of ideas and a more diverse stock of ideas encourages political competition. Transparency in financial market is one of the first laws in the process of economic globalization, and transparency spells doom for autocratic regimes. The last but not least is immigration. Fleck and Hanssen (2005) mention that the ability of a ruler to implement policy that displeases the country's populace is constrained by opportunities for residents to relocate to other countries nearby. They propose and test 'neighborhood constraint theory' that nearby countries will tend to be alike in the quality

of their governments, even in the absence of other similarities, unless substantial efforts are made to restrict people from moving.

Some limited studies can be found which just started to test institutional spillover effect empirically. Leeson and Sobel (2006), Sobel and Leeson (2007) and Leeson and Dean (2009) started to test democratic domino theory by using panel data spatial lag and error models. The first two works estimate models of spatial dependence that cover more than 100 countries between 1985 and 2000. They find that countries catch about 20 percent of their average geographic neighbor's and trading partners' level and changes in economic freedom, leads them to the conclusion that capitalism is contagious. The last study covers over 130 countries between 1850 and 2000 that finally finds a lighter empirical support than the previous ones. In this study countries catch only about 11% of the increase or decrease in their average geographic neighbors' increases or decreases in democracy.

When above studies estimate the level of democracy simply against its temporal and spatial lags, we need more elaborated models to find the determinants of institutional quality in competition with spatial spillover of governance. In fact, current paper tries to link this recently developed study area with the previous studies and findings about the determinants of institutional quality.

IV.   Methodology, data and empirical model

Spatial econometrics was proposed by Anselin (1988) and drew huge attention especially in the regional sciences. With the approach, he could address two problems that arise when sample data has a spatial configuration largely ignored in traditional econometrics. The first problem is spatial dependence. Spatial dependence in a collection of sample data observations refers to the fact that one observation associated with location i depends on other observations at location j $(i \neq j)$. The second problem is spatial heterogeneity that refers to variation in relationship over space. For instance,

economic inequality in a country has the problem of spatial heterogeneity, because the mean and variance of this variable alter in different samples (locations) of the country. These problems seriously violate Gauss-Markov assumptions and make the ordinary least square (OLS) estimation biased and inconsistent. Anselin (1988) developed maximum likelihood (ML) models to overcome OLS problems in econometric models with geographical configurations. ML is an optimal estimator which has many properties in estimation: sufficiency (complete information about the parameter of interest contained in its ML estimator); consistency (true parameter value that generated the data recovered asymptotically, i.e., for data of sufficiently large samples); efficiency (lowest-possible variance of parameter estimates achieved asymptotically); and parameterization invariance (same ML solution obtained independent of the parameterization used) (Myung, 2003).

A family of spatial econometric models which concerns spatial autocorrelation of observations is spatial autoregressive models. Eq. (1) represents the general structure of spatial autoregressive models.

$$
\begin{aligned}
y &= \rho W y + X\beta + u \\
u &= \lambda W u + \varepsilon \\
\varepsilon &\sim N(0, \sigma^2 I_n)
\end{aligned}
\tag{1}
$$

where n and k are respectively the numbers of cross-sections and explanatory variables, y represents an n×1 dependent variable vector, ρ is the scalar spatial dependence parameter, W is an n×n spatial weight matrix, X denotes the n×k matrix of independent variables, and β is an n×1 vector of associated regression parameters. The error vector u is modeled to follow a spatial autoregressive process with dependence parameter λ, and ε is an n×1 vector of normally distributed stochastic disturbances (Le Sage and Pace, 2009).

W is an n×n spatial weigh matrix with zeroes on its main diagonal. The off-diagonal elements, W_{ij}, represent the spatial relationship between cross-sections i and j. Based on the Tobler's law (1970), the common method of forming W_{ij} is to use the contiguity measures for the nearest neighbors. Under this law, first-order contiguity matrix W is

designed usually when $W_{ij}=1$ if i and j are such that there is no observation closer to either i or j, and zero otherwise. A transformation often used in applied works converts the matrix W to have row-sums of unity. This is referred to a 'standardized first-order contiguity matrix' (LeSage, 1997).

Eq. (1) can be extended to its variants by some assumptions. If we assume $\lambda = 0$, Eq. (1) is converted to the model including a matrix of explanatory variables and a spatial lag of dependent variable. Anselin (1988) provides a ML method for estimating the parameters of this model (Eq. (2)) that he labels as 'mixed regressive – spatial autoregressive model (SAR)'.

$$y = \rho Wy + X\beta + \varepsilon$$
$$\varepsilon \sim N(0, \sigma^2 I_n)$$

(2)

On the contrary, if we assume $\rho = 0$, Eq. (1) is converted to a conventional regression model with spatial autoregressive error term. This model (Eq. (3)) known as 'spatial errors model (SEM)' can be estimated by a ML method too (Anselin, 1988).

$$y = X\beta + u$$
$$u = \lambda Wu + \varepsilon$$
$$\varepsilon \sim N(0, \sigma^2 I_n)$$

(3)

SAR model is analogous to an autoregressive (AR) time-series model but with lags over geographic distance rather than time. So, for a country i, one spatial lag refers to all of i's contiguous geographic neighbors. SEM model is analogous to the moving average (MA) time-series model for contiguous geographic neighbors, which includes a spatially correlated error structure. Based on the structure of SAR and SEM models and the target of the research about studying the impact of governance spillover on institutional quality, following cross-section models were specified.

$$SAR:\ \alpha\frac{GG_i}{SE_{GG_i}} = {}_1\frac{+\alpha\ GDPP90_i}{SE_{GG_i}}\ {}_2\frac{+\alpha\ Openness_i}{SE_{GG_i}}\ {}_3\frac{+\alpha\ Nr\_Export_i}{SE_{GG_i}}\ {}_4\frac{+\alpha\ Pop\_Dens_i}{SE_{GG_i}}\ {}_5\frac{Ethnic_i}{SE_{GG_i}}$$

$$+\alpha_6 East\_Europe_i + \alpha_7 West\_Europe_i + \alpha_8 Africa_i + \alpha_9 Asia_i + \alpha_{10} America_i + \rho(W.\frac{GG_i}{SE_{GG_i}}) + \varepsilon_i \tag{4}$$

$$SEM:\ \alpha\frac{GG_i}{SE_{GG_i}} = {}_1\frac{+\alpha\ GDPP90_i}{SE_{GG_i}}\ {}_2\frac{+\alpha\ Openness_i}{SE_{GG_i}}\ {}_3\frac{+\alpha\ Nr\_Export_i}{SE_{GG_i}}\ {}_4\frac{+\alpha\ Pop\_Dens_i}{SE_{GG_i}}\ {}_5\frac{Ethnic_i}{SE_{GG_i}}$$

$$+\alpha_6 East\_Europe_i + \alpha_7 West\_Europe_i + \alpha_8 Africa_i + \alpha_9 Asia_i + \alpha_{10} America_i + u_i\ ,\quad u_i = \lambda W u_i + \varepsilon_i \tag{5}$$

In Eqs. (4) and (5), GG indicates institutional quality indicators of countries, SE_{GG} is standard error of GG indicators, GDPP90 is initial GDP per capita in 1990 (PPP, constant 2005 international $), Openness is the share of import and export of goods and services in total GDP, Nr_export is the share of fuel and ores exports in total merchandise exports, Pop_Dens denotes population density (population in square kilometer), Ethnic is ethnic fractionalization, East_Europe indicates dummy variable for eastern European countries, West_Europe is a dummy variable for western European countries, Africa is a dummy variable for African countries, Asia is a dummy variable for Asian and Oceania countries, America is a dummy variable for American countries and ε denotes error term of the estimation model.

To measure the institutional quality of countries, different indicators have been designed. For instance, international country risk guide (ICRG) has been produced by the Political Risk Services group since 1980 to report political, economic, and financial risk ratings for countries important to international business. The other indicator is corruption perceptions index (CPI) produced by Transparency International ordering the countries of the world according to the degree to which corruption is perceived to exist among public officials and politicians. In addition, based on a long-standing research program of the World Bank, the Kaufmann-Kraay-Mastruzzi worldwide governance indicators (WGIs) have been produced capturing six key dimensions of governance ranging from -2.5 (the worst) to 2.5 (the best) since 1996 , i.e., voice & accountability (VA), political stability and lack of violence (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), and control of corruption (CC) (Kaufmann et al., 2009). Regarding its multi-

dimensional definition of institutional quality, covering most of national and international reports and international outstanding position of World Bank, WGIs have become one of the most favorite indicators among the researchers and consequently used in this paper. Following the proposition of Kaufmann et al. (2009) regarding consideration of indicators' error margins, Eqs. (4) and (5) were specified as weighted equations to increase scores of countries with lower uncertainty associated with governance measurement and vice versa.

To study the impact of governance spillover on institutional quality of countries, two spatial weight matrices (W) were constructed regarding 1) common land borders and 2) common land and maritime borders of countries. When the concept of contiguity by common land borders was clear, maritime borders were defined based on the boundaries recognized by the United Nations convention on the law of the sea, which includes boundaries of territorial waters, contiguous zones, and exclusive economic zones (Anderson, 2003). Data about macroeconomic explanatory variables and ethnic fractionalization were extracted from World Bank (2010) and Alesina et al. (2003), respectively.

Regarding accessibility of data, 139 countries were selected for our study. Avoiding endogeneity problem between spatial spillover of institutional quality and the other explanatory variables, Openness, NR_Export, Pop_Dense and Ethnic variables were arithmetically averaged for the 1991–1999 period and GGs were averaged for the 2000–2008 period. To avoid endogeneity problem between real GDP per capita and the other explanatory variables, initial level of real GDP per capita in 1990 was considered in the model. Table 1 illustrates some descriptive statistics of the dependent and explanatory variables.

[Table 1 around here]

V. Findings

Tables 2 and 3 illustrate the estimation results of Eqs. (4) and (5) regarding two definitions of spatial weight matrix. Studying the results by different dependent variables

(governance dimensions) reveal the fact that two variables permanently affect all dimensions of governance quality. The first variable is real GDP per capita. Undoubtedly, real GDP per capita has been one of the most significant variables and has the clearest positive impact on institutional quality in most (if not all) of empirical studies such as Chong and Zanforlin (2000), Knack and Azfar (2003), Wei (2000), Mehlum and Torvik (2006), Islam and Montenegro (2002) and Straub (2000).

[Tables 2 and 3 around here]

As mentioned in section 2, this positive impact means that richer countries are better able to deliver services and optimal resource allocation than poorer ones through better organized system, lower corruption, more efficient bureaucracy, more stable rules, and better enforcement of rules. On the other hand, higher income increases incentive of citizens to demand better governance systems and provides enough wealth for them to protect their properties. Therefore, the first step to improve institutional quality is increasing individual wealth of people certainly not by every policy like dependence on the revenue of natural resource export.

This is in fact the second finding of this paper: what is known as resource curse can seriously decrease all dimensions of institutional quality. Sachs and Warner (1995) made a major contribution when they found a negative association between natural resource abundance and growth in a large cross-country study. This theory is modified by three findings. The first is what is known by the share of import + export on GDP as resource abundance (Sachs and Warner, 1995) is in fact resource export dependence (Stevens and Dietsche, 2008; Brunnschweiler and Bulte, 2008). The second is that an abundance of natural resources may in fact generally be much less of a curse and more of a boon for economic performance than often believed (Brunnschweiler, 2008; Bulte et al., 2005). And finally, natural resource dependence can damage institutions indirectly by removing incentives to reform, improve infrastructure, or even establish a well-functioning tax

bureaucracy –as well as directly – by provoking a fight to control resource rents (Harford and Klein, 2005). This is exactly what was found in this paper as well.

Openness in trade and more interactions with competitive global economy improve political stability, government effectiveness, regulatory quality, and rule of law of countries. This is what has been found by many researchers such as Straub (2000), Islam and Montenegro (2002) and Wei (2000). Where Easterly and Levine (1997) argue that ethnic diversity has led to social polarization and increases the likelihood of selecting socially sub-optimal policies, our study also shows it has negative association with institutional quality and seriously decreases political stability, rule of law and control of corruption. Population density is only significant when it explains political stability. Negative coefficient of Pop_Dens leads us to this fact that increasing the density of population in a country can increase the probability of political instability and violence there.

A glance to Tables 2 and 3 reveals that spatial spillover of institutions exists only in SAR models with voice and accountability, government effectiveness, rule of law, and control of corruption dependent variable, when the spatial weight matrix is extended to land and maritime borders. Regardless of their significance, rho and lambda which encapsulate spatial spillover of institutional quality are mostly positive showing the positive impact of countries' institutions on each other.

While neighborhood or contiguity concepts have different meanings in political geography, the authors tried to understand the geographical dimension of governance spillover in the model. What is clear in our finding is that existence of institutional spillover is constrained to our definition about contiguity concept. In other words, this effect is wider than common land borders and countries affect all neighbors regardless what separate them from each other. What can be concluded for the next studies is that although Tobler's law is meaningful, empirical models should not limit themselves to limited contiguity concepts. The query about the distribution pattern of governance spillover effect (spatial dimension against power of spillover) is what should be answered in the next studies.

Significant rhos in SAR models are quantitatively ranging from 0.19 to 0.22. It means that one unit average increasing in neighbors' institutional quality of a referred country can improve governance indicators of that country about 0.20. Although this impact is not enormous, it can explain 20% of governance quality of countries and the other domestic determinants which are highly significant (such as real GDP per capita and natural resource curse) can interpret only 80% of it. Our finding supports Leeson and Dean (2009), but it shows more strong spatial spillover effect. When they found that countries catch only about 11% of the increase or decrease in their average geographic neighbors' increases or decreases in democracy, we found a greater effect raging from 19% to 22% in four institutional dimensions.

In econometric models, regional dummy variables represent fixed effects stemming from geographic conditions or historical backgrounds of countries. Methodologically, it means that regional dummy variables can reduce the magnitude and significance of spatial dependence term. In spatial models with global scale, regional dummies can purify the spatial dependence term to test whether the final results can represent a global pattern. In our case, most of the regional dummies for East Europe, Africa, Asia and America show significant negative impact of these regions on institutional quality of the member countries. A modeler can conclude that if the SAR and SEM models will be estimated for these regions (instead of a global model), spatial spillover of governance will be found more broadly with higher significance and magnitude. This is what should be done in the next empirical studies.

VI.   Conclusion

Adverse outcomes of Washington consensus policies got the attention of global organizations like World Bank and IMF to institutional conditions of countries. Where institutions and institutional change have been addressed by Old and New Institutional Economics, empirical studies have completed them by investigating impacts and determinants of institutional quality since the 1980s. The current paper tried to complete the empirical studies by developing a recently developed determinant of institutional

quality, i.e., governance spillover of countries on their neighboring countries, using spatial econometric approach. What has been found was that where two variables of real GDP per capita and natural resource dependence have permanent impacts on all of six dimensions of institutional quality, trade openness, population density and ethnic fractionalization only affect some specific dimensions. In addition, dummy variables show evidences about extensive negative constant effects stem from geographical locations of countries. These effects may root in some common historical events such as colonization or their consequences such as war and terrorism.

The key finding of the paper is spatial spillover of good governance of countries on their neighbors especially in voice and accountability, government effectiveness, rule of law and control of corruption pillars. This finding is in fact the other interpretation of the concept of 'interdependence of players' in Coase Theorem. Coase (1960) believes that what connects different social players in a society is the interdependence of them rather than externalities. Interdependence exists when a choice of one agent influences that of another. This situation overlooked in conventional economic analysis which assumes that agents are independent. The authors intend to use this concept to show that countries as the members of global society are dependent on each other and their conditions or decisions seriously affect others especially their neighbors. Wanted or unwanted, the destinies of countries are tied to one-another and any member cannot progress without progress of others. In other words, institutional quality of neighboring countries goes hand in hand.

As a policy implication, countries especially which are in the same region should assist each other to improve their institutions and perceive problems of their neighboring countries as threats that may deteriorate their own institutional quality, or in contrast, look to the others' progress as blessing to improve their own governance. In addition, regional political and economic communities can play critical roles to improve their cooperation and provide good opportunities for their joint institutional improvement programs.

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Table 1

Descriptive statistics

Variables	Mean	Median	Maximum	Minimum	Standard Error	Skewness
VA	0.03	-0.05	1.61	-1.95	0.95	0.02
SE_VA	0.17	0.17	0.24	0.14	0.02	1.15
PS	-0.08	-0.07	1.55	-2.16	0.88	-0.21
SE_PS	0.24	0.22	0.40	0.21	0.04	1.96
GE	0.11	-0.14	2.20	-1.54	0.99	0.60
SE_GE	0.18	0.17	0.26	0.15	0.02	1.62
RQ	0.12	-0.10	1.88	-2.09	0.93	0.17
SE_RQ	0.19	0.19	0.27	0.16	0.02	1.24
RL	0.02	-0.25	2.02	-1.61	0.97	0.55
SE_RL	0.15	0.15	0.24	0.13	0.02	1.82
CC	0.05	-0.28	2.43	-1.29	1.01	0.84
SE_CC	0.17	0.16	0.28	0.13	0.03	1.37
GDPP90	9.54	6.05	50.89	0.26	10.11	1.48
Openness	76.72	67.75	264.04	17.22	41.71	1.54
NR_Export	23.83	11.06	99.69	0.05	28.43	1.30
POP_Dens	0.15	0.06	5.62	0.00	0.51	9.74
Ethnic	0.44	0.48	0.93	0.00	0.26	-0.07

Table 2

Estimation results for the determinants of institutional quality (contiguity as common land borders)

Dep. variables	VA		PS		GE		RQ		RL		CC	
Exp. variables	SAR	SEM	SAR	SEM	SAR	SEM	SAR	SEM	SAR	SEM	SAR	SEM
GDPP90	0.03*** (4.74)	0.03*** (4.89)	0.04 *** (5.91)	0.04*** (6.35)	0.06*** (10.28)	0.06*** (11.05)	0.05*** (8.52)	0.05*** (9.29)	0.06*** (10.00)	0.06*** (11.44)	0.06*** (10.40)	0.07*** (11.74)
Openness	-0.0004 (-0.29)	-0.0005 (-0.40)	0.005*** (3.71)	0.005*** (3.74)	0.001* (1.71)	0.001* (1.73)	0.002* (1.79)	0.002* (1.85)	0.002* (1.77)	0.002* (1.78)	0.0008 (0.67)	0.0008 (0.66)
Nr_export	-0.01*** (-5.48)	-0.01*** (-5.75)	-0.005 *** (-2.83)	-0.005*** (-2.92)	-0.008*** (-5.62)	-0.008*** (-5.78)	-0.009*** (-5.28)	-0.009*** (-5.54)	-0.008*** (-5.20)	-0.009*** (-5.65)	-0.008*** (-4.75)	-0.008*** (-4.97)
Pop_Dens	0.01 (0.11)	0.002 (0.02)	-0.19* (-1.68)	-0.20* (-1.74)	-0.03 (-0.40)	-0.04 (-0.47)	0.05 (0.50)	0.05 (0.51)	-0.06 (-0.71)	-0.07 (-0.82)	-0.02 (-0.23)	-0.02 (-0.31)
Ethnic	-0.17 (-0.70)	-0.18 (-0.76)	-0.75*** (-2.97)	-0.76*** (-3.02)	-0.24 (-1.23)	-0.24 (-1.24)	-0.06 (-0.30)	-0.08 (-0.39)	-0.48** (-2.28)	-0.52** (-2.47)	-0.40 * (-1.84)	-0.43** (-2.01)
East_Europe	1.63 (1.32)	2.01 (1.58)	-1.15 (-1.33)	-1.14 (-1.29)	-2.09** (-2.26)	-2.06** (-2.21)	-1.24 (-1.27)	-1.36 (-1.50)	-3.47** (-2.95)	-3.60*** (-3.21)	-3.62*** (-3.09)	-3.72*** (-3.30)
West_Europe	2.78* (1.95)	3.52** (2.48)	-1.22 (-1.17)	-1.10 (-1.04)	0.37 (0.33)	0.68 (0.62)	-0.28 (-0.25)	-0.42 (-0.40)	-0.13 (-0.09)	-0.05 (-0.04)	0.51 (0.39)	0.56 (0.46)
Africa	-0.97 (-0.83)	-1.22 (-1.05)	-1.16 (-1.40)	-1.34* (-1.64)	-2.49*** (-2.72)	-2.68*** (-3.03)	-2.94*** (-3.07)	-2.86*** (-3.15)	-1.94* (-1.77)	-1.95* (-1.89)	-1.78* (-1.79)	-1.76* (-1.88)
Asia	-1.31 (-1.24)	-1.46 (-1.36)	-2.66*** (-3.48)	-2.86*** (-3.81)	-1.65** (-2.08)	-1.71** (-2.15)	-2.27*** (-2.82)	-2.34*** (-3.05)	-1.92* (-1.95)	-1.98** (-2.11)	-2.30** (-2.43)	-2.38*** (-2.64)
America	1.69 (1.46)	1.98* (1.66)	-1.67** (-2.03)	-1.80** (-2.17)	-1.75** (-2.00)	-1.79** (-2.04)	-1.46* (-1.65)	-1.45* (-1.73)	-2.76** (-2.54)	-2.81*** (-2.73)	-1.85*- (1.87)	-1.81* (-1.91)
Rho	0.14 (1.55)	-------	0.08 (0.97)	-------	0.06 (0.80)	------	-0.01 (-0.13)	-------	0.04 (0.59)	-------	0.02 (0.35)	
Lambda	------	0.09 (0.87	--------	0.03 (0.26)	-------	0.02 (0.17)	-------	-0.12 (-1.06)	------	-0.10 (-0.91)	-------	-0.08 (-0.73)
Adjusted R^2	0.60	0.60	0.55	0.55	0.76	0.78	0.67	0.68	0.74	0.74	0.74	0.74
log-likelihood	-298.52	-299.44	-259.94	-260.36	-265.10	-265.40	-266.49	-266.00	-293.58	-293.37	-286.15	-285.97

The numbers in parentheses are t-values. *, ** and * show the significance level at 10%, 5% and 1% respectively.**

Table 3

Estimation results for the determinants of institutional quality (contiguity as common land and maritime borders)

Dep. variables	VA		PS		GE		RQ		RL		CC	
Exp. variables	SAR	SEM	SAR	SEM	SAR	SEM	SAR	SEM	SAR	SEM	SAR	SEM
GDPP90	0.03*** (4.89)	0.03*** (4.86)	0.04*** (6.11)	0.04*** (6.35)	0.05*** (10.18)	0.06*** (10.79)	0.05*** (8.39)	0.05*** (8.81)	0.05*** (9.88)	0.06*** (10.65)	0.06*** (10.10)	0.06*** (10.69)
Openness	-0.0003 (-0.26)	-0.0004 (-0.30)	0.005*** (3.71)	0.005*** (3.74)	0.001 (1.56)	0.001* (1.69)	0.002* (1.75)	0.002* (1.79)	0.001* (1.66)	0.002* (1.78)	0.0005 (0.46)	0.0008 (0.69)
Nr_export	-0.01*** (-5.51)	-0.01*** (-5.59)	-0.005*** (-2.91)	-0.005*** (-2.93)	-0.008*** (-5.53)	-0.008*** (-5.58)	-0.008*** (-5.17)	-0.009*** (-5.35)	-0.008*** (-5.11)	-0.008*** (-5.24)	-0.007*** (-4.68)	-0.008*** (-4.68)
Pop_Dens	0.04 (0.32)	0.03 (0.24)	-0.19* (-1.68)	-0.20* (-1.74)	-0.01 (-0.13)	-0.038 (-0.41)	0.06 (0.63)	0.05 (0.51)	-0.04 (-0.44)	-0.07 (-0.73)	0.01 (0.21)	-0.01 (-0.11)
Ethnic	-0.15 (-0.62)	-0.14 (-0.59)	-0.76*** (-3.00)	-0.76*** (-3.01)	-0.18 (-1.00)	-0.21 (-1.10)	-0.04 (-0.18)	-0.06 (-0.31)	-0.45** (-2.17)	-0.47** (-2.24)	-0.35* (-1.67)	-0.35* (-1.64)
East_Europe	1.26 (1.03)	1.82 (1.42)	-1.20 (-1.38)	-1.15 (-1.30)	-2.37*** (-2.64)	-2.02** (-2.10)	-1.42 (-1.45)	-1.25 (-1.30)	-3.57*** (-3.12)	-3.48*** (-2.90)	-3.56*** (-3.16)	-3.49*** (-2.85)
West_Europe	2.51* (1.78)	3.43** (2.40)	-1.22 (-1.16)	-1.09 (-1.04)	-0.23 (-0.21)	0.71 (0.64)	-0.60 (-0.54)	-0.32 (-0.29)	-0.64 (-0.48)	0.10 (0.08)	-0.09 (-0.07)	0.85 (0.65)
Africa	-1.03 (-0.90)	-1.58 (-1.33)	-1.17 (-1.41)	-1.35* (-1.65)	-2.14** (-2.45)	-2.75*** (-3.07)	-2.79*** (-2.95)	-2.90*** (-3.12)	-1.52 (-1.44)	-2.15** (-2.01)	-1.24 (-1.30)	-1.99** (-1.99)
Asia	-1.38 (-1.32)	-1.72 (-1.53)	-2.66*** (-3.47)	-2.86*** (-3.79)	-1.64** (-2.15)	-1.79** (-2.17)	-2.21*** (-2.77)	-2.25*** (2.82)	-1.77 * (-1.85)	-2.05** (-2.06)	-1.84** (-2.03)	-2.36** (-2.38)
America	1.63 (1.42)	1.79 (1.45)	-1.59* (-1.92)	-1.77** (-2.13)	-1.62* (-1.91)	-1.83** (-2.02)	-1.48* (-1.68)	-1.45* (-1.66)	-2.28** (-2.14)	-2.86*** (-2.61)	-1.45 (-1.51)	-1.92* (-1.83)
Rho	0.19** (2.13)	-------	0.08 (0.85)	-------	0.22*** (2.93)	--------	0.07 (0.89)	--------	0.19** (2.42)	--------	0.22*** 2.88	--------
Lambda	------	0.16 (1.49)	------	0.03 (0.30)	-------	0.09 (0.83)	------	-0.009 (-0.07)	--------	0.05 (0.46)	-------	0.16 (1.42)
Adjusted R^2	0.60	0.61	0.55	0.55	0.78	0.76	0.68	0.67	0.75	0.73	0.75	0.75
log-likelihood	-297.39	-298.54	-260.00	-260.34	-261.42	-265.10	-266.03	-266.49	-290.92	-293.65	-282.51	-285.33

The numbers in parentheses are t-values. *, ** and * show the significance level at 10%, 5% and 1% respectively.**