The impact of Good Governance on Foreign Direct Investment Inflows in Developing Countries Non-mining Sectors

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Abstract

It is widely agreed that good governance (henceforth governance) is one of the main determinants of foreign direct investment (FDI) inflows. However there is no agreement between empirical studies on whether governance attracts or hurdle FDI inflows. Both directions of the relationship have economic theories to support. In this study, deductive approach is applied to analyze the impact of governance on non-mining FDI inflows in some selected resource-dependent developing countries. Both of fixed effects and system generalized method of moments (henceforth S-GMM) models are estimated using panel macroeconomic data during the period 2000-2020. Through estimating twelve models, the study proved that improvements in governance indicators accelerate non-mining FDI inflows. Moreover, the impact differs depending on governance indicator used. Additionally, the dynamic nature of non-mining FDI inflows that can be supported by having larger markets and restricted by investing in mining sectors in the absence of supporting policies is confirmed.

Key Words: Governance, Non-mining FDI, Resource dependent economies, System-GMM

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أثر الحوكمة الجيدة على جذب الاستثمار الأجنبي المباشر للقطاعات غير الاستخراجية في الدول النامية

المستخلص

تعد الحوكمة الرشيدة أحد المحددات الرئيسية لتدفق الاستثمار الأجنبي المباشر إلى البلدان المضيفة. لا يوجد اتفاق بين الدراسات التجريبية حول اتداه تأثير الحوكمة على تدفق الاستثمار الأجنبي المباشر. وتكمن المشكلة في أن كلا الاتجاهين للعلاقة لديهما نظريات اقتصادية تدعمه. وبالرغم من حاجة البلدان النامية المعتمدة على الموارد لتنويع مصادر الدخل لديها كهدف لتحقيق التنمية المستدامة، لم تركز أى من الدراسات التجريبية المستهدفة اختبار أثر الحوكمة على تدفق الاستثمار الأجنبي المباشر على القطاعات غير التعدينية بالدول النامية. لذلك تستخدم هذه الدراسة المنهج الاستنباطي في تقدير كل من التأثيرات الثابتة (fixed effects) وطريقة نظام العزوم المعممة (S-GMM) باستخدام بيانات اقتصادية كلية مقطعية-زمنية لعدد من البلدان النامية المعتمدة على الموارد. من خلال تقدير اثني عشر نموذجًا للدول المختارة خلال الفترة 2000-2020، أثبتت الدراسة أن إجراء تحسينات في مؤشرات الحوكمة يعتبر من العوامل الرئيسية المعجلة للاستثمار الأجنبي المباشر غير التعديني. علاوة على ذلك، يختلف التأثير اعتمادًا على المؤشر المستخدم للتعبير عن الحوكمة. كما أكدت نتائج التقدير الطبيعة الديناميكية لتدفقات الاستثمار الأجنبي المباشر غير التعديني التي يمكن دعمها من خلال وجود أسواق أكبر وتقييدها بالاستثمار في قطاعات التعدين في غياب السياسات الداعمة.

1. Introduction

Attracting FDI is of great importance in both of developed and developing countries alike. The need for FDI increases in developing countries with the limitations of foreign currency resources and to control the domestic resource gap.

International organizations have supported the trend towards studying the relatively recent factors that govern FDI inflows. World Bank (2004) clarified that investment climate is represented by a set of factors those can allow institutions to invest in a productive manner. They focused among these factors on elements of governance indicators, which are considered by investors as an indicator of long-term stability.

The term governance refers to a general meaning, which is the ways in which public affairs are managed in the country. These are based on many foundations including participation, transparency, disclosure, rule of law and accountability. All of these help reduce distorted or wrong policies and achieve sustainable development (IMF, 1997).

There is a great debate about the impact of governance on FDI inflows in theory and practice especially in developing countries. Some studies stated that governance is one of the main supporters to FDI inflows (Flora *et al.*, 2019; Yakubu, 2020). Some studies confirmed that poor governance is stimulus to attract FDI inflows (Semenas, 2020; Subasat and Bellos, 2013). Others found that there is no direct effect of governance on FDI inflows (Niarachma *et al.*, 2021).

Despite considering the abundance of resources as a gift of nature available to be developed in resource-dependent developing countries, it can be a curse if investments are focused on them (Long *et al.*, 2017). The latter view is

supported by the poor economic performance in most of these countries despite the inflow of FDI in most cases. Schools of thought explain this by falling trends in relative prices in the long-term, the volatility of relative prices of minerals in the short-term and the harmful to non-mining export sectors (Eggert, 2001).

Based on the foregoing, there is an importance to assess the impact of governance on non-mining FDI inflows in resource-dependent developing countries. The isolation of mining sectors targets enhancing the role of FDI inflows in achieving sustainable development objectives in these countries through diversifying the sources of output generation.

Deductive approach is used to test the main hypothesis of the current study that improvements in governance indicators accelerate non-mining FDI inflows. To the best of our knowledge, despite the multiplicity of studies on the effects of governance on FDI attraction, estimating the effects after excluding the extractive sectors was relatively neglected. This study also contributes in testing the sub-hypothesis that significance of governance on the localization of FDI inflows in non-mining sectors differ depending on indicators referring to governance.

The study limitations are related to the selection of resource-dependent developing countries that realize two conditions. The first is an ability to separate mining investment from the total inflows of FDI. The second is the availability of governance indicators data for these countries.

The structure of the study includes five sections. Section 1 includes an introduction. Section 2 reviews the literature that

supports and opposes the impacts of governance on FDI inflows. Section 3 introduces the specification of the model, data sources and estimation technique. Section 4 provides empirical results and discussion. Section 5 involves conclusions and policy implications.

2. Review of Literature

In this section, the related literature will be reviewed in order to identify the nature of the relationship between governance and the FDI inflows, in theory and in practice, in an attempt to identify the nature and causes of the debate surrounding this relationship.

2.1 Theoretical background of the effects of governance on FDI inflows

The ambiguity of the relationship between governance and attracting FDI inflows can be explained by multiplicity of theories that clarify the localization of FDI. While some theories highlight the importance of having an environment conducive to governance to attract FDI, others explain FDI attraction by the incompleteness of markets and monopolistic tendencies that clarifies governance as an impediment to FDI.

Theoretically, Nayak and Choudhury (2014) divided theories of FDI with respect to factors affecting the localization of FDI inflows into four groups: theories based on perfect competition, theories based on imperfect markets, theories related to international trade and theories based on the strength of currencies.

The theories based on perfect competition assumed a two-country model where the return on capital equals its marginal

productivity and no restrictions on capital movements internationally. Accordingly, movements of capital internationally depend on the relative differences in marginal productivity of capital. Choosing the location for FDI inflows depends on where the maximum marginal productivity of capital exists (Kokko, 2006). Assuming perfect competition markets ignores the ability of differences in governance indicators to affect FDI locations (Nayak and Choudhury, 2014; Zarotiadis *et al.*, 2008).

The theories based on imperfect markets shifted the focus from the country-specific towards industry-level and firm-level determinants of FDI. This group of theories includes industrial organization approach, monopolistic power theory, International production theory, internalization theory, oligopolistic theory and Eclectic Paradigm theory. They all are applied on industrial organizations and started from the advantageous position for domestic firms over foreign ones in terms of language, culture, consumer's preferences and legal systems in addition to avoiding foreign exchange risks. In order to offset such disadvantages and make profits foreign firms need to have a monopolistic position in the host country that can take the form of technological superiority, brand names, management and marketing skills and economies of scale. According to this group of theories locating FDI depends on an eclectic approach that combines ownership, internalization and localization aspects (Kokko, 2006). Governance is included implicitly when mentioning localization aspect including cultural and political environment, market conditions and riskiness of investment (Morgan and Katsikeas, 1997).

According to this group of theories, the impact of governance on FDI cannot be accurately determined. Moreover, there is complexity of the relationship between the two variables due to the possibility of the two-way causality between both variables (Minh, 2019).

The theories related to international trade integrated theories of international trade with FDI theories after the great boom that occurred in intra-firms international trade as a result of the dominance of multinational corporations (henceforth MNCs) on world trade. In "Product Life Cycle Theory", Vernon stated that FDI moves in response to losing markets. The theory has been shown to be deficient in explaining two main points that were the reason for criticizing his theory. The first is when to choose FDI and when to choose licenses. The second is the determining factors for choosing the right location for foreign investment including government policies and regulations (Morgan and Katsikeas, 1997). In an attempt to explain the previous two points, the Eclectic Paradigm theory was presented, as mentioned above. Accordingly, this group of theories agrees with theories based on imperfect markets regarding the ambiguity of the relationship between governance and FDI inflows.

The theories based on strength of currency stated that optimally locating FDI depends on where the differences in the market capitalization rate between source and host countries is maximized.

One way of maximizing this rate is to direct FDI to countries with weaker currencies if the source country has a stronger currency. Differences in this rate may increase also if relatively smaller projects leave the domestic market to invest abroad in

light of their inability to compete domestically. This can explain partially why foreign firms move their investments to developing countries. According to this group of theories, the effect of governance is ambiguous. Some of the components of governance may increase the differences in the market capitalization rate between the source country and the host country. This may make more efficient domestic firms unwilling to invest in the host country and open the way for firms that are less competitive in the source country to invest in these countries. In addition, the relative differences in governance between the two countries may increase the differences between the strength of the two currencies (Nayak and Choudhury, 2014).

To conclude, the theoretical background shows that the relationship between governance and FDI inflows is complex for several reasons. First, the effects of governance on FDI inflows go in several channels some of them confirm the positive relation while others support the inverse relation. Second, governance has several dimensions and so its effects on FDI inflows depends on dimensions included referring to governance (Biro *et al.*, 2019). Third, the complexity of the relationship between both variables as it goes in both directions.

2.2 Empirical studies of the effects of governance on FDI inflows

The empirical studies did not result in a greater specification of the nature of the impact of governance on FDI inflows to the host countries. From the related literature review, it became clear the possibility of dividing the empirical studies into three

basic groups according to the nature of the relationship between the two variables. The first group supports the positive relationship between the two variables. The second group found no evidence for this positive effect for governance indicators. The third group confirms the inverse relationship between them. Some of recent studies belong to each group are introduced below.

Several studies proved that the quality of governance is rewarded in the global economy by high levels of FDI inflows. The positive relationship has been proven in these studies regardless of the countries to which it was applied; the method used in the estimation, the dimensions used referring to governance or the time periods under study.

Sabir *et al.* (2019) inspected the effect of governance on FDI inflows using panel data for 148 developing and developed countries from 1996 to 2016. The governance indicators included in Worldwide Governance Indicators of the World Bank ((henceforth WGI) are used. These dimensions are Control of Corruption, Government Effectiveness, Political Stability, Regulatory Quality, Rule of Law and Voice and Accountability. The effect of each dimension of institutional quality on FDI inflows is estimated separately. Using S-GMM, results confirmed that improvements in all governance indicators are significantly attract FDI inflows. The magnitude of the effects is greater for developed countries relative to developing countries.

Flora *et al.* (2019) tested the effect of governance on FDI in 18 Latin American host countries from 29 source countries, which are the largest investing countries globally. WGI is used referring to governance. Using a gravity model, findings

confirmed that governance is considered a factor of attractiveness for FDI inflows in Latin America.

Biro *et al.*, (2019) investigated the impact of governance on FDI in Latin American countries using a gravity model. Data used covers 18 Latin American countries for the period 2001-2012. Using both of (OLS) and (Poisson pseudo-maximum likelihood (PPML)) estimators, the study concluded that having better values for governance measured using WGI dimensions are preferable in host countries.

Bouchoucha and Yahyaoui (2019) had the same confirmation about the value of governance in attracting FDI when applying on 41 African countries divided between low income and middle income countries between 1996 and 2013 using S-GMM.

Yerrabati and Hawkes (2016) compiled 771 estimates from 48 empirical studies for the impact of governance on FDI in South and East Asia conducted during the period 1980-2012. Indicators of governance included in WGI are used. The main conclusion was that all the indicators of governance are important factors in determining FDI inflows to South and East Asia.

Minh (2019) analyzed the impact of institutional quality on FDI inflows in Vietnam using a set of panel data for 59 cities from 2010 to 2017. Provincial Competitiveness Index (PCI) survey is used referring to institutional quality. Using Difference Generalize Method of Moments (Difference-GMM), results show that institutional quality is statistically significant in affecting FDI inflows.

Yakubu (2020) investigated the effect of institutional quality on FDI in Ghana from 1985 to 2016. Institutional quality indices used are derived from International Country Risk Guide (ICRG) including bureaucracy quality, corruption index, democratic accountability index, government stability index and law and order index. Using autoregressive distributed lag (ARDL) approach; results proved that improving institutional quality provides an appropriate investment climate to attract FDI inflows.

Although most of related studies confirmed the direct relationship between governance and FDI inflows, there are studies found no evidence for the direct effect of governance or some of its components on FDI inflows, especially in developing countries.

Peres *et al.* (2018) inspected the effect of governance on FDI inflows using panel data for 110 developing and developed countries from 2002 to 2012. Governance is measured as control of corruption and rule of law. Using Instrumental variable methodology, estimation results proved that governance was statistically insignificant in developing countries. This was explained by the weak structure of institutions in developing countries.

Kurul and Yalta (2017) explored institutional factors as determinants of FDI inflows in a sample of 113 developing countries over the period 2002–2012. The six WGI dimensions are used referring to institutional factors. Using difference GMM estimator, results provide evidence that the impact of institutional factors on FDI inflows in developing countries is sensitive to the dimension used. Control of corruption, government effectiveness and the voice and accountability have

statistically significant positive impacts on FDI inflows. Political stability, regulatory quality and rule of law were statistically insignificant in affecting FDI inflows in developing countries.

Mengistu and Adhikary (2011) used WGI dimensions in order to test governance as a determinant of FDI inflows in a sample of 15 Asian countries from 1996 to 2007. Results generated from the fixed effects model (henceforth FE) stated that voice and accountability and regulatory quality were statistically insignificant in affecting FDI inflows in the sample countries.

Niarachma *et al.* (2021) analyzed the impact of governance on FDI inflows in a number of ASEAN countries from 2002 to 2018. The six WGI dimensions are used referring to governance. Using FE, the study found empirical evidence that governance encourages FDI inflows to host countries for only three dimensions. The direct effect is not proven for voice and accountability, political stability and absence of violence or terrorism and government effectiveness.

Gangi and Abdulrazak (2012) examined the impact of governance indicators generated from the WGI dimensions on FDI inflows in 50 African countries from 1996 to 2010. Panel FE and random effects (henceforth RE) estimators are used. Results provide an evidence for the impact for only three dimensions out of the six dimensions included in WGI. The direct effect is not proven for regulatory quality, political stability and control of corruption.

There are studies that have proven governance as a barrier to attract FDI inflows. Subasat and Bellos (2013) applied panel

gravity model to estimate the link between governance and FDI inflows to 18 Latin American countries during the period1985-2008. Governance indicators used includes ICRG Institutional quality indices. Findings stated that with an exception of democratic accountability, that was statistically insignificant, the rest of governance indicators were significantly negative. This confirms that poor governance encourages FDI inflows in Latin American host countries.

Semenas (2020) tested the role of institutional factors as drivers of FDI inflows in 26 emerging markets during the period 2002-2019. The WGI dimensions are used to express institutional factors. Results of static and dynamic panel gravity models confirmed that both of Government effectiveness and Rule of law are found to be negatively linked to FDI inflows.

Egger and Winner (2005) investigated the impact of corruption on FDI inflows in a sample of 73 developed and developing from 1995 to1999. This sample of countries represent more than 90% of the total world's inward FDI. Corruption data are collected from Corruption Perceptions Index of Transparency International (TI). Using generalized least squares (GLS), results found an evidence that corruption stimulus FDI inflows.

Moustafa (2020) analyzed the impact of corruption on affecting total FDI and non-oil FDI in Egypt from 1970 to 2019. Corruption data are generated from Democracy Index published by the Quality of Government Institute and the Economist Intelligence Unit. Using ARDL and the Stock-Watson dynamic OLS (DOLS), results confirmed that corruption attracts total FDI and non-oil FDI inflows in both the short run and the long run.

To summarize, there is no agreement in empirical studies about neither the existence of a statistically significant relationship between governance and FDI inflows nor the direction of it if exists. Many factors combine to give this result. First, the relationship is sensitive to the indicator used to measure governance. Second, the relationship between both variables goes in both directions. Third, the effects of some of the indicators of governance on FDI inflows differ depending on the level of development of sample countries. Fourth, the nature of the relationship between variables may result in some estimation problems, such as autocorrelation and endogeneity, those can make it sensitive to the estimation methods used. The ambiguity of this relationship makes it important to study the effects of the indicators of governance on FDI inflows in resource-dependent developing host countries those need to diversify the sources of output generation.

3. Specification of the Model, data sources, and estimation technique

In this section, the specification of the model, sources and description of data are discussed and the estimation strategy used is explained.

3.1 Specification of the Model

To investigate the effects of governance indicators on non-mining FDI inflows "*NMFDI*" six models are estimated. In each model one of the indicators of governance included in WGI is used in the presence of other control variables. The proposed empirical specification of the model will be as follow:

$$NMFDI_{it} = \propto + \rho NMFDI_{i(t-1)} + \sum_n \beta_n \, Gov_{it} + \sum_k \delta_k \, X_{it} + \lambda_i + \varepsilon_{it} \quad \text{.... (1)}$$

where i and t denote country and time period, respectively. The lag of "*NMFDI*" is used to express whether "*NMFDI*" follows a historically particular pattern. The independent variable "Gov_{it}" reflects the indicators of governance used. "X_{it}" refers to vectors of control variables; "λ_i" is a set of individual and time-invariant country's FE and ε_{it} stands for the error term.

The indicators included in WGI are used referring to "Gov_{it}". These indicators include control of corruption "$CCor_{it}$", government effectiveness "$GEff_{it}$", political stability and absence of violence "$PolSt_{it}$", regulation quality "$RegQ_{it}$", rule of law "$RLaw_{it}$" and voice and accountability "Voi_{it}".

In choosing the macroeconomic control variables in the host countries "X_{it}", only those which have been identified as having a stable long-run relationship in the literature are used. These control variables are Gross Domestic Product per-capita "*GDPPC*", Inflation calculated using GDP deflator "*Infl*", Trade openness "*Open*" measured as the summation of exports and imports as a percentage of GDP, Labor force participation rate "*LFPR*", Infrastructure measured as the percentage of individuals using the internet of population "*Infr*" that is used because of lack of better representative in sample countries, Natural resources rents "*NRR*" referring to resource abundance, Population "*Pop*", Progress in human capital "*TER*", Domestic investment "*DInv*" measured as gross fixed capital formation as a percentage of GDP, Manufacturing sector productivity "*VAInd*" and a dummy for landlocked countries "*DLock*".

Using the control variables in equation (1), the specification of the model can be shown as follow:

$$NMFDI_{it} = \propto + \rho NMFDI_{i(t-1)} + \beta_1 CCorr_{it} + \beta_2 GEff_{it} + \beta_3 PolSt_{it} + \beta_4 RegQ_{it} + \beta_5 RLaw_{it} + \beta_6 Voi_{it} + \delta_1 GDPPC_{it} + \delta_2 Pop_{it} + \delta_3 Infl_{it} + \delta_4 Open_{it} + \delta_5 LFPR_{it} + \delta_6 Infr_{it} + \delta_7 NRR_{it} + \delta_8 TER_{it} + \delta_9 DInv_{it} + \delta_{10} VAInd_{it} + \delta_{11} DLock_{it} + \lambda_i + \varepsilon_{it} \quad \ldots. (2)$$

The indicators of governance are considered the main independent variables in this model in order to test both of the main and the sub-hypotheses of the study. The expected effect and significance of indicators of governance and control variables in "*NMFDI*" inflows models are as follows:

a) The time lag of the dependent variable tests the hypothesis that FDI inflows in non-mining sectors is characterized by a dynamic nature (Kurul and Yalta, 2017; Minh, 2019). To accept this hypothesis, the variable "$NMFDI_{i(t-1)}$" need to be statistically significant and positive in the modal.
b) Control of corruption in the host country "*CCorr*" has an unknown effect. As mentioned before, some studies stated that corruption restricts FDI inflows; others found corruption as an accelerator to FDI inflows or seem less important in locating FDI.
c) Government effectiveness "*GEff*" and Regulation quality (*RegQ*) have effects those can be acceptable in both directions. The quality of governments is expected to formulate and implement market-friendly policies to attract FDI inflows (Sabir *et al.*, 2019). However, some empirical

studies found both to be significantly negative and others found that the effect is not proven.

d) Political stability and absence of violence "*PolSt*" and voice and accountability (*Voi*) are expected to accelerate FDI inflows (Yakubu, 2020). Political freedom, participation in selecting governments, accountability and stabilized governments promote FDI inflows as both help reducing uncertainty, and protecting property rights (Mengistu and Adhikary, 2011; Semenas, 2020). Despite, as mentioned before, some studies found that this direct effect is not proven.

e) Rule of law "*RLaw*" is expected to be positively linked to FDI inflows as higher enforcement of contracts and the lower likelihood of violence and crime support attracting FDI inflows (Sabir *et al.*, 2019). However some studies found that foreign investors may ignore problems in the legal system if they have a deep comfort perception about the host country. This was reflected in its effect on FDI inflows as some studies found it statistically significant in attracting FDI inflows while others found it insignificant.

f) The "*GDPPC*" refers to purchasing power and economic well-being in the host country (Alshamsi *et al.*, 2015). This variable is expected to affect NMFDI positively (Yakubu, 2020). According to the "endogenous growth theory", having larger markets may lead to accelerate the willingness to invest. Moreover, "agglomeration economies" states that the increased market size generates production cost reduction which accelerates attracting FDI inflows (Moustafa, 2020; Semenas, 2020).

g) Population "*Pop*" reflects the market size of the host country (Minh, 2019; Sabir *et al.*, 2019). Accordingly, it is expected to have a positive effect on NMFDI.
h) Inflation "*Infl*" measures the macroeconomic stability of the host country. Most studies agreed that high inflation gives rise to uncertainty leading to discouraging investment in non-mining sectors in resource-dependent developing countries (Moustafa, 2020). However, some studies found no evidence for this impact stating that inflation cannot affect FDI if it does not exceed a certain threshold (Alshamsi *et al.*, 2015; Obiamaka *et al.*, 2011).
i) Trade openness "*Open*" expected effect on NMFDI can be acceptable in both directions. It may have a positive impact on NMFDI as high trade openness leads to have larger markets for final products and it facilitates having inputs and investment goods from abroad if necessary (Moustafa, 2020; Yakubu, 2020). On the other hand, it may have a negative impact as foreign investors may use foreign investment as an alternative way to penetrate the country's markets in case of the failure to export to it because of restrictions on exports.
j) Labor force participation rate "*LFPR*" is expected to have a positive impact on NMFDI. Labor abundance can be used as an indicator for less expensive labor if they are qualified which attracts NMFDI to such host countries (Mengistu and Adhikary, 2011).
k) Infrastructure "*Infr*" has an ambiguous effect on NMFDI due to having multiple channels of effects. First, a positive effect on NMFDI can be found as improving infrastructure in the host country helps reducing logistics distribution costs

(Semenas, 2020). Usually this happens in case of vertical FDI where location decision depends mainly on a cost basis. Second, a negative effect on NMFDI can be found if MNCs target locating horizontal FDI in low infrastructure quality countries to reduce logistics costs there. Then products can be supplied to high infrastructure quality countries in lower relative costs (Castro *et al.*, 2007). The net effect depends on the initial stock of domestic infrastructure in host countries relative to regional neighbors. Castro *et al.* (2007) stated that only paved roads can reflect the effects of infrastructure on FDI locations from the perspective of foreign investors.

l) Natural resources rent "*NRR*" is expected to be negatively affecting NMFDI. The high rents in natural resources may lead to attract FDI to mining sectors and reduce FDI inflows to non-mining sectors causing a crowding-out effect (Ross 2019).

m) The progress in human capital "*TER*" measured as the ratio of tertiary education enrollment to the population of the age group that corresponds to the level of tertiary education. It is expected to have a positive effect on NMFDI as the high rates of human capital helps supplying qualified labor and results in a relative increase in demand for tradable goods that may attract MNCs to invest in such countries (Kilicarslan, 2018).

n) Domestic investment "*DInv*" is expected to have a positive or negative impact on FDI inflows. The majority of literature confirmed the complementary between domestic investment and FDI. Conversely, increasing the competitiveness of domestic companies, especially small ones, requires using

restrictions on attracting FDI (Mengistu and Adhikary, 2011).

o) Value added in manufacturing as a percentage of GDP "*VAInd*" as a proxy for manufacturing sector productivity. This effect on NMFDI can be accepted in both directions. It can have a positive effect on NMFDI as improving productivity during expansion attracts FDI to non-mining sectors. On the other hand, according to the Cost Capital Theory, the lack of capital in most of developing countries leads to reducing the value added in the manufacturing sectors. The latter increases the opportunity of FDI inflows to increase the rate of return on foreign capital in case of having the supporting factors. Accordingly, FDI inflows are attracted to countries with low levels of value added in manufacturing (Afolabi *et al*., 2019).

p) Being landlocked countries "*DLock*", measured as a dummy variable equal 1 if landlocked and 0 otherwise, is expected to be negative as poor accessibility and high transportation costs restrict attracting FDI inflows to the country.

3.2 Sample countries and data

As previously mentioned, the methodology followed by ICMM (2018) in choosing the sample countries is adopted where the country is considered resource-dependent if resources dominate more than 20 per cent of exports or its rents account for more than 10 per cent of generating GDP. A third dimension is added, for the purpose of this study, referring to countries where resources dominate more than 20 per cent of FDI inflows. The choice of the sample countries and time span

were contingent upon the availability of data on governance indicators and non-mining FDI inflows. Following the previous limitations, sample countries included in the study includes 21 countries, in which consideration was given to diversifying their geographical distribution and relying on more than one natural resource (as shown in appendix 1).

Data of controlled variables have been taken from the World Bank- World Development Indicators database except landlocked countries variable (*DLock*) which has been obtained from UNCTAD. Data of the six governance indicators have been collected from WGI. A transformation was made in the governance indicators estimates to range from 0 (weak) to 10 (strong). All the variables included in the model are transformed to a natural logarithm form except "NMFDI", "*Infl*" and "*Dlock*" those can have negative or zero values. Hereafter, the letter "L" at the beginning of the variable's name indicates the transformation of its values to a natural logarithm.

It was found that all indicators of governance are highly correlated (as shown in appendix 2). This leads to the importance of estimating six models using one of the indicators of governance in each of them. This is consistent with a number of studies that dealt with the impact of governance indicators on FDI (Sabir *et al.*, 2019; Subasat and Bellos, 2013).

Some features of data in the selected countries are notable in appendix 3. First, the averages of the natural logarithm of all governance indicators indicate that all the countries under study fall in the lower half of governance indicators according to WGI estimates. Second, standard deviations of the natural logarithm of the governance indicators used show that there is relative considerable variation in them. The highest variation

among countries included in the study was in "$LPolSt_{it}$" while the least was in "$LGEff_{it}$".

3.3 Estimation Technique

Macroeconomic data set for the 21 countries, as mentioned earlier, are used for the period 2000-2020. The choice of the number of countries included and time period of the study depend on the availability of data on all variables.

Taking into account the possibility of the two-way causal effects between "*NMFDI*" and some of governance indicators as well as the possibility of the endogeneity problem, the "Ordinary Least Squares estimation" (OLS) is inappropriate as it has a problem of omitted variable bias (Biro *et al.*, 2019). Despite that the FE could avoid this problem; it results in biased and inconsistent estimators in case of using lag dependent variable (Sabir *et al.*, 2019). Accordingly, the panel FE technique is employed, without adding the lag dependent as an independent variable, to confirm the existence of the FE which will be tested using redundant FE–likelihood ratio. In order to add the lag dependent variable, models are specified using a non-balanced yearly dynamic-panel data technique based upon S-GMM modified by Arellano and Bond (1991). Arellano and Bond (1991) used the first-differenced variables instead of their levels to exclude the individual effects in estimation dynamic-GMM model. They simultaneously used the lagged levels of predetermined explanatory variables and the differenced endogenous as instruments. Several studies used S-GMM model during estimating determinants of NMFDI to avoid estimation problems resulted from heteroscedasticity,

autocorrelation, omitted variable bias and endogeneity (Bouchoucha and Yahyaoui, 2019; Minh, 2019; Sabir *et al.*, 2019). Accordingly, following Arellano and Bond (1991), the model in equation 2 is estimated as a system of two models for each dimension of governance. The first uses lagged differences as instruments in the level of variables equation. The second employs lagged levels of variables to be included as instruments for the difference equation.

4. Empirical Results and Discussions

Before running the models, panel unit roots of variables are performed to test the stationarity of variables. Tests of "Levin, Lin and Chu (LLC)", "Im, Peseran and Shin (IPS)", "Fisher-type-ADF (FADF)" and "Fisher-type-PP (FPP)" are used. As shown in appendix 4, variables of "*NMFDI*", "*LVoi*", "*LPolSt*", "*LGEff*", "*LRegQ*", "*LCCOR*", "*LPop*" and "*Infl*" are found to be stationary in their levels while variables of "*LRLaw*", "*LOpen*", "*LLFPR*", "*LGDPPC*", "*LInfr*", "*LNRR*", "*LTER*", "*LDInv*" and "*LVAInd*" are found to be stationary with their first difference. Hence, all variables included in the models can be cointegrated.

The correlation analysis which is illustrated in appendix 2 proved that all the correlation coefficients between "*NMFDI*" and governance indicators were positive with an exception of "*LCCOR*". This supports both of theoretical findings and the sub-hypothesis of the current study. Additionally, the correlation coefficients between "*NMFDI*" and all the control variables have the expected signs which support the theoretical basis of determinants of locating inward FDI.

Panel FE vs. RE are employed using Hausman test. Then the existence of the FE is tested using redundant FE-likelihood ratio. The results strongly reject that both of cross-section and period effects are redundant. The results of FE models proved that four out of the six governance indicators are statistically significant as shown in appendix 5. The coefficients of "*LVoi*", "*LPolSt*", "*LRLaw*" and "*LRegQ*" are positive and statistically significant at least at 5% critical levels. The coefficients of "*LGEff*" and "*LCCOR*" are statistically insignificant in affecting "*NMFDI*". Accordingly, the results regarding the effects of governance indicators on "*NMFDI*" inflows are sensitive to the dimension used. This confirms the results of Kurul and Yalta (2017), Mengistu and Adhikary (2011) and Niarachma *et al.* (2021).

Variables of "*LGDPPC*", "*LDINV*" and "*LTER*" are statistically significant in all models and have the expected positive sign. The variable "*LVAInd*" is statistically significant in all models and has the expected negative sign. Variables "*LLFPR*" and "*LPop*" have the expected positive effects in models where they are statistically significant. Variables "*LOpen*" and "*LNRR*" have the expected negative effect in models where the variables are statistically significant in. The results regarding the variable "*LOpen*" highlights the importance of having FDI as an alternative way to export in case of having restrictions. The results regarding the variable "*LNRR*" highlights the crowding-out effect between investing in mining and non-mining sectors.

Using Wald test to check for the possibility of the endogeneity problem, results confirmed that variables of

"*LGEff*", "*LRegQ*", "*LRLaw*", "*LVOI*", "*LGDPPC*", "*LLFPR*" and "*LDINV*" are endogenous variables in *NMFDI* model. In order to eliminate the FE and avoid biased and inconsistent estimators in case of having the endogeneity problem and to add the lag dependent variable, models are specified using a S-GMM. The values of the Sargan test of over-identifying restrictions rejected the null of over-identifying restrictions in all models used to estimate equation 2. The tests of Arellano-Bond test for AR(2) imply that problems of second order autocorrelation in differences can be rejected. The results of estimating the Dynamic S-GMM models are reported in appendix 5.

As shown in appendix 5, the results of S-GMM models confirmed both of the theoretical basis and the FE regarding governance as determinants of NMFDI as all of them are statistically significant in the models except "*LVoi*" and "*LCCOR*". More specifically, the estimated coefficients of "*LPolSt*", "*LGEff*", "*LRegQ*" and "*LRLaw*" are positive and statistically significant in their models. This confirms that improving these indicators of governance can accelerate attracting FDI inflows to non-mining sectors in sample countries. This leads to the acceptance of the main and the sub-hypotheses of the current study. These results are consistent with studies of Kurul and Yalta (2017), Sabir *et al.* (2019) and Yakubu (2020). The statistically insignificance of "*LVOI*" and "*LCCOR*" are consistent with the results of Mengistu and Adhikary (2011), Niarachma *et al.* (2021) and Peres *et al.* (2018). In order to explain these results, Tole and Koop (2011) stated that some governance indicators like control of corruption are of less importance relative to other determinants

like the level of security if the former do not exceed certain thresholds. Peres *et al.* (2018) confirmed this especially in developing countries because of the relatively weak structure and performance of institutions.

The rest of the statistically significant independent variables included in the S-GMM models have the expected signs. The statistically significance of the time lag of the "*NMFDI*" confirmed the dynamic nature of FDI inflows to non-mining sectors in sample countries. This is consistent the results of Kurul and Yalta (2017) and Minh (2019). The statistically significant parameters of "L*GDPPC*" and "L*Pop*" in all S-GMM models confirmed that greater market size accelerate FDI inflows to non-mining sectors in sample countries. This is consistent with results of Minh (2019), Moustafa (2020), Semenas (2020) and Yakubu (2020). The variable "L*Infr*" is found to be statistically significant and negatively affects NMFDI in all S-GMM models except that uses "*LRegQ*". This illustrates that MNCs prefer to locate their investments in low infrastructure quality host countries to reduce logistics costs which confirms the findings of Castro *et al.* (2007). The variable "*LNRR*" is found to be statistically significant and negatively affects NMFDI in all S-GMM models confirming the crowding-out effect between investing in mining and non-mining sectors. This is consistent with the findings of (Ross 2019).

The variable "*LOpen*" is found to be statistically significant and has a positive coefficient in S-GMM models using "*LRLaw*" and "*LCCOR*" referring to governance. This confirms the importance of having bigger markets and facilitating having

inputs in attracting FDI inflows to non-mining sectors in sample countries. The variable "*Infl*" is found to be statistically insignificant in all S-GMM models. This is consistent with results of Alshamsi *et al.* (2015) and Obiamaka *et al.* (2011). Alshamsi *et al.* (2015) explained this by stating that inflation cannot affect FDI if it does not exceed a certain threshold. The variable "*LDINV*" is found to be statistically significant and has a positive coefficient in S-GMM models using "*LVoi*" and "*LCCOR*" referring to governance. This confirms the complementary between domestic investment and FDI in non-mining sectors of studied countries.

The variable "*LLFPR*" is found to be statistically insignificant in all S-GMM models. This can be explained, in the studied countries, by the presence of factors those are more important than the abundance of labor such as the availability of qualified labor to deal with technology associated with foreign investment. Moreover, this variable explains a ratio that does not reflect labor supply and labor cost. The statistically insignificance of "*LTER*" in all S-GMM models can be explained by the weak ability of tertiary education enrollment, which is used because of the lack of having a better indicator, to express the progress of human capital in host country. The statistically insignificance of "*LVAInd*" in all S-GMM models can be explained by the weak ability of the variable to express the manufacturing sector productivity. The variable "*DLock*" is found to be statistically insignificant in all S-GMM models. This can be explained by the weak ability of being landlocked referring to poor accessibility and high transportation costs as restrictions to attracting FDI inflows to host countries.

5. Conclusions and policy implications

This study tested the hypothesis that improvements in governance indicators accelerate non-mining FDI inflows. It explores both of the theoretical and empirical impacts of governance indicators on non-mining FDI inflows in a number of resource-dependent developing countries. The study concluded that theoretically, the impacts of governance on non-mining FDI inflows is complex as the effects go through several channels depending on the indicators used referring to governance. Moreover, the impact may go in both directions. This leads to the lack of clarity in the net impact of improved governance on FDI inflows theoretically. The empirical studies did not result in a greater specification of the nature of the impact of governance on FDI inflows to the host countries.

In estimating this effect, FE is used to avoid the possibility of the two-way causal effects between "*NMFDI*" and some of governance indicators as well as the possibility of the endogeneity problem. Additionally, S-GMM technique is used in order to add lag dependent variable to the model. Accordingly, twelve models of non-mining FDI inflows are estimated using one of the six governance indicators in each as an independent variable. The estimation gave several implications regarding the determinants of non-mining FDI inflows in the sample of resource-dependent developing countries. First, results confirmed the main hypothesis that governance is statistically significant in affecting non-mining FDI inflows. Second, this impact differs depending on the indicator used referring to governance which confirmed the sub-hypothesis of the current study. Third, control of corruption

is of less importance relative to other determinants if it does not exceed certain thresholds which also confirmed the sub-hypothesis of the current study. Fourth, non-mining FDI inflows have a dynamic nature and follow a historical pattern. Fifth, having larger markets in host-countries accelerate non-mining FDI inflows. Sixth, inflation cannot affect non-mining FDI inflows if it does not exceed a certain threshold. Seventh, the crowding-out effect between investing in mining and non-mining sectors is proven.

Results of the study can lead to a number of recommendations to support the effectiveness of attracting non-mining FDI inflows to resource-dependent developing countries. Among these recommendations:

1. Focusing more effectively within the strategies of diversifying economies that some indicators of governance are relatively more important than others on attracting FDI.
2. Evaluating the improvements in the governance indicators within a regional framework and not to focus just on the national level putting into account that the initial levels of governance indicators compared to those of regional neighbors need to be considered while formulating FDI attraction policies.
3. Targeting the improvements in the worst governance indicators compared to regional neighbors as a top priority to attract FDI inflows to non-mining sectors.
4. Putting into account when formulating FDI attraction policies that some of governance indicators cannot affect FDI attraction to non-mining sectors if it does not exceed certain thresholds. Other factors become more important in affecting FDI to non-mining sectors.

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Appendix 1: Resource-dependent countries included in the study

	Hydrocarbons	Metal and minerals	Both
Asia	Brunei Oman Uzbekistan	Armenia Indonesia Mongolia	Kazakhstan
South America	Ecuador	Chile Colombia	Bolivia Peru
Africa	Egypt	Rwanda Tanzania Uganda Zambia	Mozambique
Others*	Azerbaijan Russia	Georgia	

* Others include Eurasia countries.

Appendix 2: Correlation matrix of included variables over the period 2000-2020

Correlation (Prob.)	NMFDI	LVoi	LTER	LRLaw	LRegQ	LPop	LPolSt	LOpen	LNRR	LLFPR	LInfr	LGEff	LGDPPC	LVAIND	LDInv	LCCOR	Infl
NMFDI	1 -----																
LVOI	0.097 (0.123)	1 -----															
LTER	0.331 (000)	0.163 (0.009)	1 -----														
LRLaw	0.054 (0.391)	0.223 (0.000)	0.157 (0.012)	1 -----													
LRegQ	0.095 (0.128)	0.333 (0.000)	0.274 (0.000)	0.866 (0.000)	1 -----												
LPop	0.459 (0.000)	0.053 (0.401)	-0.029 (0.659)	-0.401 (0.000)	-0.422 (0.000)	1 -----											
LPolSt	-0.102 (0.106)	0.015 (0.811)	-0.082 (19)	0.415 (0.000)	0.285 (0.000)	-0.555 (0.000)	1 -----										
LOpen	-0.236 (0.0001)	0.083 (0.188)	0.075 (0.234)	0.261 (0.000)	0.273 (0.000)	-0.648 (0.000)	0.551 (0.000)	1 -----									
LNRR	0.029 (0.647)	-0.266 (0.000)	-0.201 (0.001)	-0.030 (0.639)	-0.160 (0.011)	0.009 (0.885)	0.151 (0.016)	0.278 (0.000)	1 -----								
LLFPR	-0.059 (0.346)	0.152 (0.015)	-0.435 (0.000)	-0.142 (0.024)	0.035 (0.575)	-0.074 (0.236)	0.169 (0.007)	0.041 (0.516)	0.083 (0.187)	1 -----							

Appendix 2 (Cont.): Correlation matrix of included variables over the period 2000-2020

Correlation (Prob.)	NMFDI	LVoi	LTER	LRLaw	LRegQ	LPop	LPolSt	LOpen	LNRR	LLFPR	LInfr	LGEff	LGDPPC	LVAIND	LDInv	LCCOR	Infl
LInfr	0.221 (0.0004)	-0.211 (0.001)	0.679 (0.000)	0.270 (0.000)	0.279 (0.000)	-0.209 (0.001)	0.196 (0.002)	0.189 (0.002)	0.055 (0.386)	-0.249 (0.000)	1 -----						
LGEff	0.118 (0.059)	0.197 (0.002)	0.347 (0.000)	0.843 (0.000)	0.828 (0.000)	-0.444 (0.000)	0.366 (0.000)	0.272 (0.000)	-0.096 (0.127)	-0.048 (0.449)	0.454 (0.000)	1 -----					
LGDPPC	0.253 (0.000)	-0.057 (0.369)	0.644 (0.000)	0.452 (0.000)	0.488 (0.000)	-0.393 (0.000)	0.272 (0.000)	0.346 (0.000)	0.198 (0.002)	-0.238 (0.001)	0.776 (0.000)	0.620 (0.000)	1 -----				
LVAInd	0.211 (0.001)	0.249 (0.000)	0.218 (0.000)	0.006 (0.921)	-0.078 (0.217)	0.355 (0.000)	-0.275 (0.000)	-0.297 (0.000)	-0.081 (0.201)	-0.364 (0.000)	-0.205 (0.001)	0.061 (0.336)	0.058 (0.364)	1 -----			
LDInv	0.086 (0.170)	0.035 (0.582)	0.049 (0.439)	0.073 (0.246)	0.092 (0.145)	0.018 (0.775)	0.176 (0.005)	0.090 (0.153)	-0.151 (0.016)	0.115 (0.067)	0.184 (0.003)	0.107 (0.088)	0.105 (0.096)	-0.082 (0.196)	1 -----		
LCCOR	-0.051 (0.415)	0.384 (0.000)	0.137 (0.029)	0.839 (0.000)	0.747 (0.000)	-0.452 (0.000)	0.341 (0.000)	0.266 (0.000)	-0.105 (0.096)	0.041 (0.515)	0.228 (0.002)	0.824 (0.000)	0.357 (0.000)	-0.001 (0.998)	0.034 (0.585)	1 -----	
Infl	0.043 (0.494)	-0.159 (0.011)	-0.157 (0.012)	-0.128 (0.042)	-0.161 (0.010)	0.168 (0.007)	-0.145 (0.020)	-0.113 (0.070)	0.146 (0.019)	-0.116 (0.064)	-0.183 (0.003)	-0.208 (0.001)	-0.136 (0.030)	0.097 (0.128)	-0.148 (0.018)	-0.218 (0.0004)	1 -----

L at the beginning of the variable name indicates the transformation of values to a natural logarithm.

Source: Author calculations depending on sources of data.

Appendix 3: Descriptive statistics of main variables over the period 2000-2020

	NMFDI	LCCOR	LGEff	LPolSt	LRegQ	LRLaw	LVoi
Obs.	295	420	420	420	420	420	420
No. of cross sections	21	21	21	21	21	21	21
Mean	3495.9	1.3	1.48	1.39	1.5	1.4	1.31
Median	705.36	1.352	1.439	1.428	1.492	1.398	1.426
Maximum	62117.4	2.102	2.063	2.051	2.089	2.062	2.0261
Minimum	-4635.7	0.8148	0.95	-1.38	-0.235	0.715	-0.286
Std. Dev.	7234.3	0.277	0.223	0.429	0.311	0.265	0.405
Skewness	4.403	0.645	0.625	-1.612	-0.906	0.303	-1.307
Kurtosis	28.306	2.9459	3.076	8.858	5.827	3.206	5.529

Source: Author calculations depending on sources of data.

Appendix 4: Summary of Panel Unit Roots of Variables

Var. name	Calculated $p-value$ (Probability)				Degree of integration
	LLC	IPS	FADF	FPP	
NMFDI	-4.27 (0.000)	-1.89 (0.098)	57.12 (0.059)	56.69 (0.065)	I~(0)
LVoi	-3.97 (0.000)	-4.01 (0.000)	98.44 (0.000)	75.81 (0.001)	I~(0)
LPolSt	-3.14 (0.000)	-3.67 (0.000)	79.35 (0.004)	65.77 (0.011)	I~(0)
LGEff	-5.03 (0.000)	-4.51 (0.000)	89.30 (0.000)	76.04 (0.001)	I~(0)
LRegQ	-4.67 (0.000)	-2.99 (0.001)	94.5 (0.000)	45.98 (0.311)	I~(0)
LRLaw	-2.77 (0.002)	-088 (0.188)	51.55 (0.148)	27.17 (0.963)	I~(1)
LCCOR	-2.58 (0.004)	-1.47 (0.071)	68.32 (0.006)	56.25 (0.7)	I~(0)
LGDP	4.26 (1.00)	8.18 (1.00)	3.74 (1.00)	3.07 (1.00)	I~(1)
LPop	-7.49 (0.000)	-6.26 (0.000)	131.93 (0.000)	40.7 (0.528)	I~(0)
LOpen	-1.96 (0.025)	-0.68 (0.248)	46.87 (0.28)	31.68 (0.877)	I~(1)
LLFPR	-1.832 (0.034)	-0.63 (0.263)	55.11 (0.085)	34.5 (0.788)	I~(1)
LGDPPC	4.19 (1.000)	8.26 (1.000)	3.62 (1.000)	2.97 (1.000)	I~(1)
Infl	-18.40 (0.00)	-13.46 (0.00)	287.9 (0.000)	289.2 (0.000)	I~(0)
LInfr	-2.4 (0.008)	0.51 (0.694)	43.57 (0.404)	69.11 (0.005)	I~(1)
LNRR	-0.60 (0.273)	0.14 (0.556)	52.09 (0.137)	17.46 (0.999)	I~(1)
LTER	0.85 (0.803)	2.29 (0.989)	36.94 (0.692)	42.13 (0.465)	I~(1)
LDInv	0.09 (0.538)	-0.04 (0.483)	47.03 (0.274)	28.27 (0.948)	I~(1)
LVAInd	-2.16 (0.152)	-0.94 (0.173)	59.97 (0.040)	43.97 (0.388)	I~(1)

Source: Prepared by the author depending on estimation results.

Appendix 5: Panel FE and S-GMM Models Results (NMFDI as a dependent variable)

Variable	Using LVoi as LGov		Using LPolSt as LGov		Using LGEff as LGov		Using LRegQ as LGov		Using LRLaw as LGov		Using LCCOR as LGov	
	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM
C	-381577*** (-2.7127)	-92974.9 {-1.46}	-401339*** (-2.93)	-42917*** {-2.69}	-343880** (-2.32)	-43093.8* {-1.81}	-397106*** (-2.72)	-56121*** {-3.75}	-477213*** (-2.88)	-59515*** {-3.12}	-351993** (-2.38)	-91204 {-1.3}
NMFDI(-1)		0.563*** {17.3}		0.627*** {15.08}		0.628*** {11.78}		0.617*** {18.86}		0.6199*** {17.17}		0.562*** {8.54}
LGov	11620.5*** (2.99)	-748.16 {-0.59}	2445.4*** (3.12)	1401.9** {2.46}	-485.83 (-0.14)	2481.6** {2.19}	6564.3** (2.43)	1458.8** {2.18}	9280.7*** (2.71)	1790.2* {1.92}	-52.235 (-0.02)	1116.1 {0.88}
LGDPPC	7409.74*** (2.61)	3999.2*** {2.68}	9239.9*** (3.12)	1877.2** {2.39}	10146.3*** (3.38)	1898.96** {2.2}	9531.3*** (3.27)	1822.5*** {2.75}	10016.3*** (3.52)	2270.7** {2.0}	10219.5*** (3.51)	3984.8*** {3.34}
LLFPR	14819.5* (1.67)	4188.298 {0.4}	18618.9** (2.26)	1237.5 {0.62}	24007.9*** (2.85)	-105.55 {-0.03}	14477.3 (1.48)	2792.54 {1.1}	14084.1 (1.47)	1959.49 {0.3}	23965.4*** (2.77)	3043.47 {0.26}
LOpen	-5055.27** (-2.59)	2724.6 {0.94}	-2643.004 (-1.41)	84.45 {0.11}	-3248.9 (-1.68)	911.84 {1.48}	-3734.1* (-1.96)	1051.8 {1.21}	-2549.1 (-1.38)	1405.86* {1.8}	-3170.5* (-1.7)	2583.5* {1.67}
LPop	16177.9* (1.92)	2301.2*** {4.39}	15245.7** (2.1)	1520.3*** {3.4}	10150.8 (1.29)	1642.2*** {3.93}	15972.1* (1.86)	1626.1*** {5.4}	20376.9** (2.07)	1875.8*** {3.72}	10570.9 (1.29)	2411.9*** {3.92}
LDINV	2904.9** (2.31)	3214.5* {1.79}	3181.36** (2.41)	268.65 {0.65}	3676.3*** (2.75)	383.39 {1.01}	3158.8** (2.44)	209.7 {0.48}	3058.6** (2.32)	460.75 {0.81}	3642.6*** (2.74)	3047.5* {1.84}
LVAInd	-9045.1*** (-4.24)	-1624.77 {-0.59}	-7012.8*** (-3.51)	-835.05 {-0.87}	-7317.3*** (-3.62)	-1082.13 {-1.34}	-7688.8*** (-3.71)	-355.5 {-0.27}	-8236.8*** (-3.83)	-980.48 {-0.84}	-7353.2*** (-3.58)	-1757.1 {-1.06}
LTER	4183.3*** (3.06)	-226.87 {-0.36}	4644.9*** (3.3)	333.86 {0.89}	5121.1*** (3.57)	-39.34 {-0.12}	4298.0*** (2.91)	24.92 {0.08}	3897.5*** (2.69)	-14.102 {-0.04}	5154.1*** (3.7)	-441.6 {-0.69}
LNRR	-1573.03** (-1.98)	-1438.8** {-2.32}	-1342.9* (-1.72)	-434.06** {-2.17}	-1280.415 (-1.61)	-404.98** {-1.98}	-1325.2* (-1.66)	-354.2* {-1.79}	-1179.2 (-1.61)	-579.14* {-1.93}	-1277.3 (-1.62)	-1306.8** {-2.57}
Infl	14.05302 (0.44)	24.096 {1.2}	11.92383 (0.39)	9.86 {0.6}	6.921235 (0.22)	-5.156 {-0.36}	12.72398 (0.4)	9.01 {0.92}	18.429 (0.57)	-0.637 {-0.03}	7.4107 (0.24)	26.388 {0.8}

Appendix 5 (cont.): Panel FE and S-GMM Models Results (NMFDI as a dependent variable)

Variable	Using LVoi as LGov		Using LPolSt as LGov		Using LGEff as LGov		Using LRegQ as LGov		Using LRLaw as LGov		Using LCCOR as LGov	
	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM
LInfr	175.9048 (0.18)	-2095.92* {-1.85}	-62.43012 (-0.06)	-894.16* {-1.78}	167.2254 (0.16)	-913.7** {-2.02}	-289.5432 (-0.29)	-597.18 {-1.01}	-428.89 (-0.43)	-1014.5* {-1.68}	113.62 (0.12)	-1961.1*** {-2.7}
Dlock		1219.95 {1.11}		-51.02 {-0.1}		401.56 {0.88}		336.23 {0.6}		728.6 {1.27}		1635.98 {1.3}
Redundant FE Tests												
	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
Cross-Section / Period (Chi-Sq.)	141.93 [0.000]		123.59 [0.000]		128.9 [0.000]		135.96 [0.000]		135.5 [0.000]		132.7 [0.000]	
Cross-Section/ Period (F)	4.02 [0.000]		3.37 [0.000]		3.55 [0.000]		3.8 [0.000]		3.79 [0.000]		3.69 [0.000]	
System GMM Related Tests												
AR(2) p-value[1]		0.212		0.218		0.217		0.22		0.216		0.215
Sargan Test[2]		0.349		0.739		0.987		0.359		0.571		0.167

The symbols *, ** and *** reflects the significance at 10%, 5% and 1% levels.

Values in () refer to t-statistics, values in {} refers to z- statistics and values in parenthesis [ ] refer to probability.

[1] Arellano-Bond test for Second-order autocorrelation AR(2). AR(1) is measured but not reported.

[2] Sargan test of over-identifying restrictions

Source: Prepared by the researcher depending on estimation results.