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Does inward FDI influence the quality of domestic institutions? A cross-country panel analysis

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Abstract

Domestic institutions are recognized as important in attracting foreign direct investment (FDI) and spurring economic development in host countries, but FDI can also affect and shape domestic institutions. In this paper we use extensive data on the quality of institutions and on inward FDI in 127 countries over a period of 22 years to see whether attracting FDI improves the quality of institutions in the host economies. We distinguish between different types of institution, FDI and country, and we estimate a series of pooled ordinary least squares, fixed effects, and dynamic panel data models to address endogeneity. Our findings suggest that higher amounts of inward FDI improve the average quality of institutions in recipient countries. This holds particularly when the quality of institutions is measured in terms of political stability, regulatory quality and rule of law, and when host countries are developing or transition economies.

Keywords: quality of institutions, foreign direct investment, panel data

JEL codes: F23, F63, O43, O57

1. Introduction

In the last two decades, the international economics and business literature has amply explored the determinants of inward foreign direct investment (FDI), and acknowledged the relevance of host countries' institutions[1]. Although most of the literature has focused on how institutions influence inward FDI (see Bailey, 2018 and Mondolo, 2018 for a review), institutions are unlikely to be unaffected by the strategies of multinational enterprises (MNEs), and consequently by FDI. Foreign firms generally attempt to adapt to local institutions to overcome the "liability of foreignness" and obtain legitimacy in the host markets (Kostova & Zaheer, 1999; Dahan et al., 2006). They also typically try to shape the local business environment in their favor (Boddewyn, 1988; Hillman & Hitt, 1999). Meanwhile, countries sensitive to the benefits of inward FDI, and committed to gaining legitimacy and international reputation within the bigger, global business community will deliberately adopt policies to attract foreign investment (Martin & McKibbin, 1999; Kwok & Tadesse, 2006). The reason why, and the extent to which national governments are willing to modify their institutions or policies, either to influence the behavior of MNEs, or as a result of MNEs' increasing presence in the global economy, can be found in Dunning's eclectic OLI paradigm. According to this approach, the probability of domestic governments taking such action is a positive function, *ceteris paribus*, of the number of distinctive ownership-specific advantages of MNEs, and of their ability to augment or combine these assets with local resources and skills. This probability raises with the appeal of a given country's own location-specific assets to inward investors, and with the competition between MNEs for the host country's resources, capabilities or markets (Dunning & Lundan, 2008).

In the last twenty years or so, a growing number of empirical studies have looked at what Kwok & Tadesse (2006, p. 767) call *"the other side of the picture*" in the relationship between inward FDI and institutions. This issue is still under-researched, however, and existing works focus only

[1] We adopted Hodgson's definition of institutions as "*the systems of established and embedded social rules that structure social interactions"* (Hodgson, 2006, p.13). Property rights, rule of law, corruption and political rights are typically considered examples of institutions. This work focuses on formal institutions, namely those founded on codified, explicit rules and standards that shape the interaction between members of society by promoting stability and regulation (North, 1990; Scott, 2008a).

on one institutional factor or policy (such as corruption or environmental regulation) at a time, on relatively small samples of countries, and/or on narrow time frames.

This study aims to provide a global assessment of the effects of inward FDI on the quality of domestic institutions. Specifically, we test whether inward FDI is an agent of institutional change, and an indirect driver of economic development, particularly in transition and developing economies. We merge data from different sources covering a sample of 127 countries and 22 years. In estimating the impact of inward FDI on the quality of host countries' institutions, we distinguish between advanced, developing and transition economies, and apply different measures of FDI. We split the overall quality of a country's institutions into six elements: voice and accountability, political stability, government effectiveness; regulatory quality, rule of law, and control of corruption. We adopt fixed-effects and system generalized method of moments (GMM) dynamic panel models to control for unobserved heterogeneity and to address the potential endogeneity affecting the relationship between FDI and institutional quality.

We find that attracting FDI has a positive impact on the average quality of domestic institutions. This effect is stronger when: (i) institutions are measured in terms of political stability, government effectiveness, and especially regulatory quality and rule of law; (ii) recipient countries are developing economies or, to a lesser extent, transition economies; (iii) FDI takes the form of greenfield projects. These results are robust to unobserved heterogeneity, simultaneity, and alternative measures of institutional quality. We therefore posit that policies to attract FDI can help developing regions to improve the quality of their institutions, and, as a consequence, their level of economic development.

The paper is organized as follows: Section 2 discusses the conceptual framework, showing the mechanisms through which MNEs affect domestic institutions (2.1), and reviewing the literature on the effects of inward FDI on certain types of institution (2.2); Section 3 describes the empirical model and the data; Section 4 presents the results of the estimates; Section 5 concludes.

2. Conceptual framework

2.1 The main mechanisms through which MNEs affect domestic institutions

In recent decades, the literature has increasingly acknowledged the role of multinational companies, and consequently of inward FDI, in influencing the institutional framework of host countries, to such a degree that MNEs have sometimes been defined as "agents of change" (Kwok & Tadesse, 2006; Neffke et al., 2018), "agents of economic transition" (Malesky, 2009), and "institutional entrepreneurs" (DiMaggio, 1988; Dahan et al., 2006).

Multinationals can often shape local business environments because they generally exert more political influence (typically over public officials) than domestic firms for two main reasons. One is the host country's belief that the MNE will contribute to domestic economic growth, which increases the latter's bargaining power when negotiating the terms of its entry in the host market. The other is the international dimension of the MNE, which implicitly means: lower costs of moving to another country (Desbordes & Vaudey, 2007); knowledge of sophisticated market rules; the opportunity to adopt transfer pricing schemes and benefit from subsidies unavailable to local firms (Ramirez & Kwok, 2009); more experience in managing institutional idiosyncrasies (Henisz, 2003). MNEs thus often resort to lobbying to influence governmental policies that matter to their activities, such as regulations concerning trade protection and the local environment (see Section 3.2.2), or taxation.

Foreign investors may also foster local institutional quality: by providing information on laws adopted in other recipient countries; by actively collaborating with local actors in the provision of services (see Section 3.2.2); by creating or participating in policy networks within transnational social and economic systems, as Dahan et al. (2006) point out. The authors define a policy network as a *"self-organizing group that coordinates a growing number of public (decision-makers) and private (interest groups) actors for the purpose of formulating and implementing public policies"* (Dahan et al., 2006, p.1578). They also provide several examples of international organizations that can be described as policy networks, such as the Transatlantic Business Dialogue, the World Commission on the Social Dimension of Globalization, and the Global Climate Change Coalition.

Generally speaking, MNEs exert a more indirect influence on local environments too. Starting from an analysis of the concepts of institutional isomorphism and disembeddedness[2] (see DiMaggio & Powell, 1983, and Dacin et al., 1999), Kwok & Tadesse (2006) identify three main effects of MNEs on host countries, mainly through their impact on domestic firms, and on local workers hired by foreign companies: (i) the regulatory pressure effect, (ii) the demonstration effect, and (iii) the professionalization effect. The *regulatory pressure effect* derives from subsidiaries being exposed to political and economic pressures exerted by the host country, the parent company's home country, and the international business community, where the latter tends to delegitimize questionable activities and introduce compulsory requirements and norms of conduct (Sandholtz & Gray, 2003; Kwok & Tadesse, 2006). To give an example, the regulatory pressure effect can make foreign companies' employees more reluctant to offer bribes, and this helps to discourage corruption.

Foreign firms may also show domestic firms how to conduct business differently - and potentially more efficiently, effectively and transparently. This *demonstration effect* is fueled by the spread of MNEs' standardized business procedures and corporate lifestyles across the world, which tend to replace local firms' organization patterns (DiMaggio & Powell, 1983). This explains why Westney (1993) claims that such local organization patterns undergo a process of de-institutionalization. Historical examples include the transfer of US management models and incentive structures to Europe in the 1950s and '60s, and of Japanese work practices and quality control procedures to the US and Europe in the '80s (Dunning & Lundan, 2008).

Finally, there is *professionalization effect* due to the ability of MNEs to attract talented young workers. This is because they typically rely on cutting-edge technologies and more advanced managerial techniques, and they offer better working conditions and salaries. To increase their chances of being recruited, some young people attend business schools, obtain international certifications, and join professional associations. In doing so, they not only gain professional skills,

[2] Starting from the concept of "embeddedness of organizations", Dacin et al. (1999) argue that globalization may be regarded as a disembedding process that strips individuals and firms of their local structures and allows for restructuring at a more global level. A concept related to disembeddedness that helps us understand firms' behavior is what DiMaggio & Powell (1983) called *institutional isomorphism*: organizations tend to take into account and imitate the behavior of other organizations faced with a similar set of environmental conditions.

but also become increasingly open-minded and reluctant towards obsolete ways of doing business and conservative values. They can thus contribute to gradually updating their country's business culture, which - over time - may shape personal values, human motivation, and the social organization of production (DiMaggio & Powell, 1983; Kwok & Tadesse, 2006).

2.2 The effects of inward FDI on host countries' institutions: literature review

The mechanisms outlined in Section 2.1 help to clarify why and how MNEs' inward FDI can influence various aspects of recipient countries' institutional environment. This section briefly reviews the literature concerned with this issue, focusing particularly on the effects of FDI on corruption, government policies, and international relations. More detailed information on a selection of papers mentioned in this section is provided in Table 1. The table makes it easy to compare these studies in terms of: the selected dependent variables and FDI regressors; the subjects and time frames considered; the use of econometric methods to address endogeneity; the statistical significance and sign of the effects of FDI on the types of institution considered; the main conclusions.

TABLE 1 HERE

2.2.1 FDI and corruption

Several researchers have investigated the impact of inward FDI on corruption, broadly definable as *"the use of public office for private gains"* (Bardhan, 1997, p. 1321). According to Kwok & Tadesse (2006), increasing inward FDI reduces the host country's level of corruption over time by means of the demonstration effect, and especially of the regulatory pressure effect. The authors' quantitative analysis, conducted on a large sample of countries over 30 years, provides empirical support for this claim.

Whether more inward FDI discourages or stimulates corruption is much debated, however. On the one hand, FDI can reduce a country's propensity to engage in illegal activities because corruption-

averse foreign investors - like American and European investors (Wei, 2000) - can easily quit the market. Countries more integrated in international society, and where FDI is important to the local economy, are also more exposed to economic and normative pressures against corruption (Sandholtz & Gray, 2003; Larrain & Tavares, 2004). Since the introduction of the OECD Convention against bribery, foreign firms from OECD countries are increasingly likely to engage in legal lobbying activities (Desbordes & Vauday, 2007). As suggested by the demonstration effect, moreover, inward FDI may promote the diffusion of pro-business norms and the adoption of new values and ideas, especially from developed countries with more solid and transparent institutions. This inclines recipient countries more towards good governance practices and the strengthening of property rights protection and the rule of law, while discouraging illicit activities (Gerring & Tacker, 2005; Lee & Lio, 2016). Finally, corruption generally acts as a disincentive for investments because it increases the risk and uncertainty for potential investors and raises the costs of doing business (Getz & Volkema, 2001; Robertson & Watson, 2004). As Rose-Ackerman (1975) put it, corruption may become less common if it has long-term negative consequences for the firms and individuals involved, as is the case with FDI projects.

That said, FDI is vulnerable to corrupt activities because it is typically associated with large infrastructure projects and privatization programs involving sizable economic rents. This vulnerability is generally greater where there are lax regulatory frameworks, discretionary decision-making, and imperfectly accountable public officials. In such cases, foreign investors are more likely to conform to the local culture and business practices, including any illegal behavior (Larrain & Tavares, 2004; Lee & Lio, 2016). The eagerness of foreign investors to enter the market may also tempt host-country nationals to use corruption as a means of sharing the local opportunities for profit with the investors (Robertson & Watson, 2004). Drawing on their advanced knowledge of international business and vast international networks, MNEs may also develop sophisticated bribery schemes and "import" them in the host countries (Kwok & Tadesse, 2006). After assessing the influence of inward FDI on the perception of corruption in 95 countries during the years 2000-2004, Pinto & Zhu (2016) contend that whether FDI has a positive or negative effect on corruption levels depends mainly on the host country's economic and political conditions, and on the availability of local resources. Bayar (2011) looks at 10 countries in Eurasia or East Asia, and finds instead that FDI is not a significant determinant of corruption in these geographical regions.

Another relevant issue concerning FDI and corruption is endogeneity. Most of the empirical studies on the influence of FDI on corruption take endogeneity into account, typically by resorting to an instrumental variable approach. Craigwell & Wright (2011) use linear and non-linear Granger causality tests instead to see which direction of causality prevails. Their findings suggest that, when employing the linear panel methods, most markets show a two-way causal link between FDI and corruption, but when nonlinear tests are used, the link from FDI to corruption dominates.

2.2.2 FDI and government policies

Foreign firms generally attempt to influence some host government policies because the profitability of their FDI largely depends on the business environment in which they operate. Such corporate political strategies have been investigated mainly in the endogenous protection literature (Desbordes & Vaudey, 2007). MNEs may influence the level of trade protection by undertaking "quid pro quo" direct investments (which alleviate protectionist pressures), and by lobbying (see, for instance: Bhagwati et al., 1992; Grossman & Helpman, 1996; Blonigen & Figlio, 1998; Gawande et al., 2006). FDI can also affect local environment regulation, but whether for better or for worse has long been the object of debate. According to a widely-held view, mostly known as the "pollution haven hypothesis" (Cole et al., 2006; Copeland, 2008), pollution-intensive firms tend to open subsidiaries in countries with less stringent environmental regulations. According to the so-called "trade-up hypothesis", which has recently been gaining ground, FDI may even contribute to improving local environment protection. It has been claimed that international integration gives developing countries the opportunity to learn advanced environmental technologies, standards and management systems, and the incentive to use them (Lin et al., 2014). To give an example, Zeng & Eastin (2012) conclude that MNEs from the least developed countries find it increasingly advantageous in financial terms to signal their commitment to environmental protection to consumers, investors, and potential business partners by adopting sound environmental practices. These authors thus judge that FDI from such countries can positively affect local environment protection. Whether the "pollution haven" or the "trade-up" hypothesis dominates depends on the characteristics of the countries and firms involved. In particular, Cole et al. (2006) suggest that the positive impact of inward FDI on the stringency of environmental regulations is higher, the lower the local government's corruptibility.

As well as pursuing their own interests, MNEs sometimes collaborate with a host country's enterprises with the aim of strengthening and upgrading the quality of local services, for training human resources, for instance (e.g. Rasiah, 2002, and Okada, 2004). As an example, Wrana & Revilla-Diez (2016) find that MNEs running cooperation projects with local schools in Vietnam can positively influence the quality of local education by introducing institutional elements of their home country's skills training system. As also observed by Dunning & Lundan (2008), the upgrading of local vocational training enables MNEs to inject and disseminate a business culture in the host country.

2.2.3 FDI and international relations

Inward FDI may improve the quality of the bilateral political relations between a parent company's home country and a host country, increasing their economic interdependence, and thus making military conflicts more costly. FDI can therefore even help to defuse military tensions (Russett & Oneal, 2001; Kahler & Kastner, 2006; Levy, 2003; Gartzke et al., 2001). Polacheck et al. (2012) make an important empirical contribution to this strand of literature: considering bilateral FDI involving a total of 53 countries, they find that a 10% growth in FDI is associated with a 3.3% increase in net cooperation. An interesting case study on this issue comes from what is often considered the most centralized economy in the world, North Korea. In 2004 the country opened a special economic zone (the Gaeseong Industrial Complex, or GIC), which has attracted investments from other countries, and South Korea in particular (Kim, 2016). The GIC could act as a conflict management tool and help to contain the military tensions between the two countries by increasing their economic interdependence (Haggard & Noland, 2008), but also by influencing North Korean people's opinions of South Korea (Yang et al., 2013). In the long term, the GIC might motivate North Korea to undertake a process of transformation from a totally planned economy to a more open, market-oriented one (Lee & Lee, 2013; Kim, 2016).

2.2.4 FDI and other institutional factors

Increasing inward FDI and integration in the world economy may also lead to *de facto* decentralization. Such investments can provide subnational actors with resource flows that make them more independent of central government authorities, reinforcing the importance of subnational policies for economic development (Malesky, 2008). Evidence of this "empowerment of local leaders" effect has been found, for instance, in Kazakhstan (Jones-Luong, 2003), Mexico (Diaz-Cayeros et al., 2003), and Vietnam (Malesky, 2008).

FDI can also contribute to ideological convergence across countries. Based on data emerging from detailed individual questionnaires administered in 28 provinces of mainland China, Lin (2018) claims that those who work for enterprises controlled by foreign investors (especially when the latter are not from Hong Kong, Macao and Taiwan) tend to be more in favor of freedom of speech than individuals working in non-multinational domestic firms. According to Kim (2016), a gradual ideological convergence - triggered partly by the employees in the two countries working side by side in the GIC - could take place in the long term between the two Koreas as well (see Section 2.2.3).

2.3 Research hypotheses

From our literature review (Table 1), we can see that the reported effects of corruption on FDI are rather varied, while there seems to be a positive effect of FDI on all the other types of institution considered. Some authors posit that MNEs can favor the adoption of more advanced business practices and more liberal values, encouraging local authorities to embark on processes of modernization, decentralization and liberalization, and to address weaknesses in their institutional framework. In other words, in addition to affecting the business practices and decision-making processes of local authorities to their advantage, foreign MNEs can also trigger a gradual, positive process of adaptation of the host country to higher standards of governance and regulation (Hewko, 2002; Malesky, 2009).

Many of the studies we reviewed focus mainly on developing and/or transition economies, so how and to what degree FDI affects such countries seems to be of particular interest. Nowadays,

developing countries, and transition economies even more, are catching up and modernizing, and they have more scope for improving their institutional quality than advanced countries. Developing and transition economies often rely on a more malleable institutional framework. At the same time, foreign investors - especially in transition economies like the post-communist countries - generally do not settle for a passive role in the host country's reform process, but work closely with government actors (Malesky, 2009). In doing so, they can promote more advanced business practices, and favor the strengthening of property rights protection and the rule of law (which are generally under-developed in these countries). They can also help improve the quality of public services, such as the provision of vocational training in Vietnam. Finally, as contended in Section 2.2.4, FDI can stimulate decentralization processes in countries dealing with an unequal distribution of political power and low levels of democracy - which are generally transition or developing economies (like the three mentioned in Section 2.2.4).

In the light of these considerations, we expect: (i) inward FDI to have a positive influence on the *average* quality of domestic institutions; (ii) such an influence to be stronger in developing and transition economies than in advanced countries[3]; and (iii) the influence of FDI to vary by type of institution considered.

3. Empirical analysis

3.1 Data

Our sample consists of 127 countries (see the Appendix, Table A.1, for the full list) observed over 22 years, from 1995 to 2016. The time frame is restricted to the years 2003 to 2016 when we consider the number (or value) of greenfield FDI as the focal regressor because the corresponding data were not available before 2003. The countries are split into three main groups by level of

[3] In recent years, there has been a remarkable increase in outward FDI from some countries in South-East Asia, namely Singapore, Hong Kong, and China especially. To give an example, in 2015, China was the biggest investor in the Developing Asia region, and the fourth main investor in Africa (UNCTAD, 2018). Because this phenomenon is quite recent, however, for the whole 22-year time frame (1995 to 2016) considered in this work, most of the FDI in developing and transition economies came from developed countries.

development[4]: advanced countries, developing countries and transition economies. We merge information from different data sources, including: UNCTAD for the data on FDI inflows, the Worldwide Governance Indicators provided by the World Bank Group for the data on the quality of institutions, and the World Development Indicators provided by the World Bank for all the other covariates included in our econometric model (see the Appendix, Table A.2 for the full list of variables and related sources).

3.1.1 Dependent variable

The dependent variable is the "quality of governance index" (QGOV), which is the average of the six Worldwide Governance Indicators (WGI) produced by Daniel Kaufmann and Aart Kraay and made available by the World Bank Group. These widely-accepted and often-used indicators are based on a broad definition of governance. Specifically, Kaufmann et al. (2011, p. 222) identify governance as *"the traditions and institutions by which authority in a country is exercised. This includes: (a) the process by which governments are selected, monitored and replaced; (b) the capacity of the government to effectively formulate and implement sound policies; and (c) the respect of citizens and the State for the institutions that govern economic and social interactions among them"*. QGOV may thus serve as a good proxy for the overall quality of a country's institutions. The six WGI range from approximately -2.5 (the lowest quality) to +2.5 (the best quality), and are available for most of the world from 1996 onwards. They concern the following complementary governance dimensions:

[4] We split the sample according to the United Nations classification, except for the Eastern European countries currently belonging to the EU (i.e. Slovenia, Slovakia, Hungary, Czech Republic, Poland, Croatia, Lithuania, Latvia, Estonia, Romania and Bulgaria). The latter are classified as transition economies due to the historical, cultural and economic similarities with the other ex-URSS and Western Balkans countries. As an illustration, Tukunaga & Iwasaki (2017), who recently conducted a meta-analysis of empirical studies on the determinants of inward FDI in the transition economies, include also works focusing on Central-Eastern Europe.

- *voice and accountability*, which captures perceptions of the extent to which citizens are able to participate in the selection of their government, as well as freedom of expression, freedom of association, and free press and media;

- *political stability and absence of violence/terrorism*, which is related to perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism;

- *government effectiveness*, capturing perceptions of the quality of public services, the quality of the civil service, and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies;

- *regulatory quality*, concerning perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development and market-oriented strategies;

- *rule of law*, which reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence;

- *control of corruption*, capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the State by elites and private interests.

The WGI condense information from a wide set of perception-based governance data sources (e.g. the World Economic Forum's Global Competitiveness Report, the Institute for Management Development's World Competitiveness Yearbook, and the World Bank/EBRD Business Environment and Enterprise Performance surveys) and measure several relevant types of institution, such as civil liberties, political rights and freedom of the press, property rights, rule of law, and corruption (World Bank Group, 2018).

Finally, as a robustness check (see Section 4.4), we employ the index of Economic Freedom produced by the Heritage Foundation (https://www.heritage.org/index/). Although this index focuses mainly on economic institutions, it covers a wide range of institutional aspects, and

partially overlaps with some of the WGI. To be more specific, this broad index is scored from 0 (lack of economic freedom) to 100 (full economic freedom) based on 10 indicators: property rights, freedom from corruption, fiscal freedom, government spending, business freedom, labor freedom, monetary freedom, trade freedom, investment freedom, and financial freedom (Heritage Foundation, 2018).

Figure 1 shows the trend of the QGOV between 1995 and 2016 for all the countries in our sample, and for the sub-samples of developing and transition economies.

FIGURE 1 HERE

Across all countries, the level of the institutional quality index remains fairly stable over time, though it decreases slightly in the early years of the new millennium compared with the level recorded in the second half of the 1990s. This is due mainly to the performance of the developing economies, which experienced a deterioration in the quality of their institutions during that period, caused largely by lower levels of political stability and regulatory quality. This decline has been followed by a gradual recovery, driven mainly by the South-East Asian region. On the other hand, overall institutional quality has improved remarkably over time in the transition economies, which have embarked on pervasive processes of modernization, privatization and democratization since the early 1990s.

3.1.2 Focal regressor

We measure FDI inflows in three ways. The first refers to the real net FDI (RFDI) inflows measured in millions of US dollars[5]. Data on yearly inward FDI flows at current prices come from UNCTAD FDI Statistics. Then we use data on countries' GDP deflator from the World Bank's dataset of World Development Indicators to compute the yearly inward FDI flows in real terms. The second variable is given by FDI inflows as a share of national GDP (FDI/GDP): while RFDI

[5] The results do not change remarkably when FDI inflows at current prices are used.

provides a measure of the absolute amount of inward FDI, the ratio of FDI to GDP gives us a measure of the relevance of FDI inflows to the recipient country's economy. Third, we include the number of inward greenfield FDI projects (GRFDI). This variable is based on data from the FDI Markets Dataset developed by the Financial Times Group, and is available also in the Annex Tables of the World Investment Reports provided by UNCTAD. Unlike the other two variables, GRFDI counts the actual investment projects undertaken by MNEs in host countries. While cross-border mergers and acquisitions (M&A) may involve just a change of ownership between firms, greenfield FDI are investment projects that entail new assets and activities being established in the host country (UNCTAD, 2009), so they can have a greater impact on the host country' economic and institutional framework. MNEs typically prefer to undertake greenfield FDI rather than M&A in developing and transition economies because of a general lack of suitable domestic companies, and because the potential reverse flows of knowledge and technology from the host country to the parent company's country of origin in these areas tend to be relatively low. This limits the chances of success for a M&A, which relies on significant two-way flows between the acquiring and acquired organizations. Conversely, creating new greenfield establishments in developing and transition economies enables MNEs (and particularly those from advanced countries) to organize, configure and control all aspects of the production or service process (Iammarino & McCann, 2013).

Figure 2 shows the dynamics of FDI inflows between 1995 and 2016 for the whole sample of countries, and separately for transition and developing economies. Looking at the whole sample, FDI inflows have increased considerably since the mid-1990s, except during the periods of the financial and sub-prime crises in 2008-09 and 2012-14, respectively. Transition economies attracted a sizable amount of FDI, particular from the mid-1990s up until 2008-2009. The contraction seen in 2015 is driven mainly by four large economies - Russia, Ukraine, Kazakhstan and Azerbaijan – reducing their FDI (partly due to political uncertainty and military tensions in their area). There has since been a recovery and, according to UNCTAD analysts, this trend should continue in the coming years (UNCTAD, 2018).

FIGURE 2 HERE

3.1.3 Control variables

When investigating the effects of inward FDI on institutions, we control for some macro-economic factors in the host country that might affect its institutional quality. First, we control for country size, in terms of total population (POP). Second, we control for the degree of urbanization, using population density (DENS). The effects of these variables on institutional quality are ambiguous, however. Larger total populations and higher population density levels may be positively influenced by lower mortality rates, good-quality medical facilities, and immigration dynamics deriving from the presence of economic opportunities. In other words, they may reflect a degree of economic development, which can then be expected to correlate positively with institutional quality. As Lee & Lio (2016) suggest, a certain level of population density can also help achieve economies of scale in the provision of public services. On the other hand, overpopulation can be an obstacle to the provision of public services and, more in general, to the effective handling of the additional governance challenges of a densely-populated country. Overpopulation may also be driven by a high average number of children per woman, which is often associated with poverty and poor education, and may point to a lack of economic and especially social development, and therefore negatively influence institutional quality.

We also control for the industry mix of a country, including the value added of services (SERV) and industry (IND) as a share of its GDP (taking the share of value added in primary sectors for reference). We thus implicitly control for a country's level of development, which should be higher, the higher the share of value added from its service-related activities. The influence of industrialization is more ambiguous because, as Lee & Lio (2016) suggested, it can create a large number of rent-seeking opportunities that may foster corruption.

Then we include a variable computed as the sum of exports and imports divided by the GDP (TRADE) as a proxy of trade openness: this variable is expected to have a positive effect on the quality of institutions for much the same reasons as those already discussed regarding inward FDI. Previous studies showed, however, that this indicator's influence on institutional quality varies, depending on the type of institution (especially after controlling for the countries' level of development), and the sample of countries considered (Islam & Montenegro, 2002; Knack & Azfar, 2003). In particular, Rigobon & Rodrik (2005) find a weak positive relationship between

trade openness and the rule of law, but a negative relationship between the former and democracy: the authors interpret this in terms of distributive tensions generated by economic openness.

Furthermore, we control for inflation (INFL) using the GDP deflator, and for unemployment (UNEMP) as given by total unemployment as a proportion of the total labor force, because these factors can give rise to conflict, socio-political instability, and insecurity, which can negatively affect the quality of institutions.

The availability of network infrastructure such as telephone and internet communications can improve the quality of domestic institutions, and thereby also the efficiency of governance and citizens' participation in political life. We consequently also include a variable measuring total broadband and landline telephone subscriptions per 100 population (BROADTEL). This indicator is likely to be strongly related to education, and the positive effect of education on institutional quality has been emphasized by Alesina & Perotti (1996) and others (see Alonso & Garcimartin, 2013, for a review)[6]. All this information comes from the World Development Indicators provided by the World Bank[7].

Finally, we include a series of dummies capturing whether or not countries belong to certain political and commercial organizations, or participate in trade agreements that might increase the attraction of FDI. Such organizations and agreements include: the OECD (Organization for Economic Cooperation and Development); the UEMOA (Union Economique et Monétaire Ouest Africaine); the COMESA (Common Market for Eastern and Southern Africa) and/or CFTA (Continental Free Trade Area); the SADC (Southern African Development Community); the APEC (Asia-Pacific Economic Cooperation); the UNASUR (Union of South American Nations); the CACM (Central American Common Market); the NAFTA (North American Free Trade

[6] Actually, BROADTEL correlates strongly with our selected proxy for education (i.e. the average number of years of schooling, derived from the Human Development Index dataset provided by the United Nations). Two relevant aspects concerning education, the perceived quality of primary education and the coverage of primary schooling, are also captured by the WGI "Government effectiveness", which is one of our dependent variables. This probably explains why the coefficient of the variable "average number of years of schooling" is not significant in most of the regression estimates (available on request). In the light of these considerations, we decided to omit it from the model.

[7] We do not include GDP per capita among regressors because it is highly correlated with population density, trade openness and use of internet communications. Moreover, we also include GDP when using the FDI/GDP variable as the focal regressor. Finally, GDP per capita is a proxy for economic development, and it can partly capture the state of institutional quality in a country.

Agreement); the ASEAN (Association of Southeast Asian Nations); the MERCOSUR (Mercado Común del Sur); the EU (European Union) and the Schengen area. Table 2 provides the summary statistics and the correlation matrix for all the continuous variables.

TABLE 2 HERE

3.2 Empirical strategy

Our empirical analysis is conducted in two steps. First, we proceed with a cointegration analysis because our panel involves 127 countries and 22 years, and both our dependent variable and our focal regressor are in levels and potentially not stationary. We thus test first whether inward FDI and the quality of institutions are linked by a non-spurious, long-run relationship. Then we run a regression analysis to estimate the impact of FDI inflows on the host country's institutional quality, while controlling for unobserved heterogeneity and reverse causality.

Before developing the cointegration analysis, we test whether QGOV and our FDI variables have a unit root. We use the Im-Pesaran and Shin (IPS) test, which allows for individual effects, time trends and common time effects, and assumes that all series (i.e. all panels) in the dataset are non-stationary under the null hypothesis. For comparison, we also use an augmented Dickey Fuller (ADF) test, including a time trend and a variable number of lags.

If both the QGOV index and our FDI variables are I(1) processes, then we proceed to test for their cointegration. We use the Westerlund approach, which has good small-sample properties, and the null hypothesis of no cointegration is tested for at least some of the panels. If the null hypothesis is rejected, we can say that their long-run relationship is not spurious. The test also allows us to check whether QGOV is weakly exogenous in the FDI equations, thereby testing whether or not FDI is affected by QGOV in the long run.

Table 3 shows the results of all the tests. The upper part shows that QGOV is non-stationary. Neither the IPS nor the ADF statistics reject the null hypothesis of unit root, whereas the null hypothesis is rejected at 1% level when we put lnQGOV in first difference. As for our three FDI

variables, the two tests do not reject the null hypothesis of unit root in the majority of the cases, whereas they do reject it when the variables are in first difference. We thus conclude that inward FDI are also characterized by the presence of a unit root.

The bottom part of Table 3 shows the results of the cointegration test. The test always rejects the null hypothesis of no cointegration at 1% level. We conclude that inward FDI and quality of government are cointegrated and characterized by a non-spurious long-run relationship. The tests also show, however, that QGOV is not weakly exogenous in all the FDI equations: this means that the two variables influence each other in the long run.

TABLE 3 HERE

Second, to assess the causal impact of inward FDI on the quality of domestic institutions, we run a regression analysis. We start estimating the following baseline model:

$$QGOV_{it} = \beta_0 + \beta_1 FDI_{it} + \boldsymbol{X}_{it}\boldsymbol{\beta_2} + \theta_t + \delta_R + \in_{it} \quad (1)$$

where $QGOV_{it}$ is the index capturing the institutional quality of the country *i* in the year *t*, which is further broken down into the following six elements: voice and accountability (V&A); political stability (POLST); government effectiveness (GOVEFF); regulatory quality (REGQ); rule of law (RLAW); and control of corruption (CORR). To facilitate the interpretation of these variables, we normalize them between 0 and 1 using the following transformation: [*x*-*min*(*x*)/*max*(*x*)-*min*(*x*)]. We also transform each variable into a natural logarithm.

The vector $\boldsymbol{X}_{it}$ includes the control variables, namely: total resident population (POP); population density (DEN); trade openness (TRADE); inflation (INFL); unemployment (UNEMP); the share of value added in industry (IND) and services (SERV); and total broadband and landline telephone subscriptions per 100 population (BROADTEL). Here again, we transform these variables into natural logarithms, except for inflation.

Finally, we include a vector of year-specific dummies (θ_t), and a vector of region-specific dummies (δ_R), identified using the UN geo-scheme. All standard errors are clustered at country level.

To account for unobserved heterogeneity, we also estimate a model with fixed effects:

$$QGOV_{it} = \beta_1 FDI_{it} + \boldsymbol{X}_{it}\boldsymbol{\beta_2} + \mu_i + \theta_t + u_{it} \quad (2)$$

where μ_i is the vector of time-invariant characteristics of the country *i*, and u_{it} is the stochastic error term.

Finally, to account for the persistence of institutional quality, and for potential simultaneity with inward FDI (as emerged from our preliminary cointegration analysis), we also adopt a linear dynamic panel approach using the system GMM estimator provided by Arellano & Bover (1995), and by Blundell & Bond (1998). A system of two equations is estimated, one in first differences and one in levels, with the latter (equation 3) including area and time fixed effects:

$$QGOV_{it} = \beta_1 QGOV_{it-1} + \beta_2 FDI_{it} + \boldsymbol{X_{it}}\boldsymbol{\beta_4} + \mu_i + \theta_t + u_{it} \quad (3)$$

where $QGOV_{it-1}$ is the institutional index of the country *i* in the year *t*-1[8].

The instruments are used to establish the moment conditions. Following Roodman (2009), we use a parsimonious specification that limits the number of instruments as much as possible in order to contain losses of efficiency. For the sake of simplicity, here we only consider FDI as potentially endogenous with respect to institutional quality, whereas we assume that all the other regressors are exogenous. Thus, in the equation in levels, we instrument the FDI variable by the corresponding first difference at the time *t*-1, which is assumed to be uncorrelated with the error term in levels. In the equation in first differences, we use one-year lagged values of the FDI in levels as instruments, which are assumed not to correlate with the error term in first difference. We calculate equation 3 using the two-step system GMM estimator, and we apply Windmeijer's correction to the variance-covariance matrix to obtain heteroscedasticity-robust standard errors. To estimate the system GMM model, we need a first-order serial correlation in the first-differenced residuals, and no second-order serial correlation. We check for this using the Arellano-Bond test

[8] When we re-estimate equations 1, 2 and 3 over the years 2003-2016 (to make them comparable with those obtained with greenfield FDI), we find no relevant differences in the results concerning real inward FDI and FDI on GDP.

for serial correlation. We also test for over-identifying restrictions in our model by performing the Sargan test.

4. Results

Tables 4, 5 and 6, respectively, show the pooled OLS, fixed effects, and SYS-GMM estimates on the whole sample, using QGOV as the dependent variable. Looking at the pooled OLS estimates in Table 4, the estimated coefficients of all three FDI variables are positive and statistically significant. In particular, *ceteris paribus*, a 10% increase in real FDI inflows is related to an average 0.1% increase in institutional quality (Columns 1 and 2), while a 10% increase in FDI/GDP is related to an average 0.11-0.15% increase in institutional quality (Columns 3 and 4). Columns 5 and 6 show that, *ceteris paribus*, a 10% increase in inward greenfield FDI is associated with an average 0.8% increase in the quality of institutions[9]. To gain an idea of the magnitude of these effects, it is worth bearing in mind that the mean annual rate of growth in QGOV in the full sample of 127 countries is -0.002, with a minimum of -0.182, a maximum of 0.211, and a median of 0. An estimated coefficient of 0.012 nears the top 25th percentile of the distribution, while a coefficient of 0.08 belongs to the 1st percentile. This suggests that increasing FDI, and greenfield FDI in particular, is related to a remarkable improvement in the quality of domestic institutions. As regards the control variables, we find larger total populations and higher inflation rates related to a lower institutional quality, whereas the latter is better, the greater the relevance of a country's services sector, the higher the share of people using the communications infrastructure, and when the country is a member of the OECD. To test for potential multicollinearity, we run a VIF test for each estimated model: the value of the mean test statistics is always lower than 5.

TABLE 4 HERE

[9] We also calculated equation 1 using the value of greenfield FDI instead of their number, obtaining results that are qualitatively the same. We found that a 10% increase in the value of inward greenfield FDI correlated with an average 0.21% increase in the quality of domestic institutions. These results are not reported to save space, but are available on request.

Table 5 shows the fixed effects estimated with equation 2[10]. The magnitude and statistical significance of the coefficients of the FDI variables are lower than in the pooled OLS estimates probably due to unobserved heterogeneity. The fixed effects estimates nonetheless suggest that attracting FDI, and greenfield projects in particular, is positively related to an increase in the overall quality of institutions.

TABLE 5 HERE

When we estimate equation 3 using the two-step SYS-GMM approach (Table 6), we still find a positive and significant coefficient for real FDI inflows and the number of greenfield FDI. The fact that lnFDI/GDP is not statistically significant might be due to the quality of institutions and the level of GDP changing simultaneously. An alternative measure (which also accounts for a country's size) is FDI by size of resident population, lnFDI/POP: when we replace lnFDI/GDP with this measure, the estimated coefficient turns positive and statistically significant. Since system GMM estimates account for endogeneity, we can posit that, *ceteris paribus*, more inward FDI *induces* an increase in the average quality of domestic institutions. Looking at the diagnostic tests, the LM test on the AR(1) and AR(2) confirms the presence of first-order serial correlations in the first-differenced residuals, while the Sargan test confirms the absence of over-identification and the validity of our instruments. In conclusion, these results are consistent with our first research hypothesis.

TABLE 6 HERE

[10] Although they are not time-invariant, the OECD and the various trade agreement dummies are omitted from the fixed effects estimates due to their low variability, but the results do not change if we include them.

4.1 Results by type of country

We now turn our attention to the estimates by type of country, distinguishing between advanced, transition and developing economies. Table 7 shows the SYS-GMM[11] estimates for these separate groups of countries. To save space, we only report the estimated coefficients for the lagged QGOV and our FDI variables.

In the case of advanced economies, only the estimated coefficient of real inward FDI is positive and statistically significant, whereas those of the other two FDI variables are not significantly different from zero. This is probably because most inward FDI in developed countries takes the form of M&A, and because the quality of institutions is already high.

For transition economies, the results in Table 7 show that a 10% increase in the inward FDI/GDP induces, *ceteris paribus*, an average 0.04% increase in the overall quality of domestic institutions, while for a 10% increase in greenfield FDI projects there is a 0.32% improvement. The effect of real FDI remains not statistically different from zero.

As for developing countries, the SYS-GMM estimates in Table 7 show a positive and significant effect of inward FDI on the average quality of domestic institutions, except for the case of lnFDI/GDP[12]. Specifically, *ceteris paribus*, a 10% increase in greenfield FDI projects increases the quality of domestic institutions by an average 0.24%, whereas the corresponding effect for real FDI inflows is 0.05%.

Taken together, these results confirm our expectations: inward FDI is a driver of institutional quality, particularly in transition and developing countries, and when it takes the form of greenfield projects.

TABLE 7 HERE

[11] The limited number of observations prevents us from using the two-step estimator because, even with the most parsimonious version of the model, the variance-covariance matrix is never full-ranked. We therefore opt for the one-step estimator.

[12] A possible explanation for this lies in that FDI accounts for a larger share of the GDP in transition economies (mean 4.6%) than in developing countries (mean 3.8%). If we replace lnGFDI/GDP with lnFDI/POP, the coefficient turns positive and significant at 1% level.

4.2 Results by type of institution

FDI probably has a different impact on different types of institution. To test our third hypothesis, we assess the effect of inward FDI separately on each of the six dimensions of institutional quality. While Table 7 shows the results of our estimations when the dependent variable is the *average* quality of institutions, Table 8 summarizes the system-GMM estimated coefficients of the FDI variables, for transition economies and developing countries, respectively[13], using each of the six main elements of the QGOV as a dependent variable.

TABLE 8 HERE

In transition economies, the impact of inward FDI is significant in the case of greenfield FDI, in terms of improving domestic regulatory quality, and rule of law, and - to a lesser extent - also political stability and voice & accountability. We can see no significant influence on control of corruption, however.

When looking at developing countries, the types of institution most affected by FDI inflows are political stability and rule of law, and only the former is also influenced by inward greenfield projects. Such projects also contribute weakly to improving average government effectiveness in the recipient country. As in the case of transition economies, inward FDI has no significant impact on control of corruption.

These results are consistent with our hypothesis concerning the diverse effects of FDI on different institutional dimensions. In particular, while in transition economies inward FDI (mainly greenfield projects) has more impact on institutions linked to the functioning of the market, ease of doing business, and corporate climate, in less-developed regions it tends more to affect institutions related to the public sphere, such as political stability, government effectiveness, and rule of law.

[13] We omit the summary of the estimates for the whole sample to save space. We only found a positive and significant coefficient for the influence of greenfield FDI when voice & accountability ($p<0.05$), and rule of law ($p<0.1$) were the dependent variables.

4.3 Other robustness checks

Finally, our results can be affected by the way in which institutional quality is measured and the cumulative nature of FDI, so we check the robustness of our results with two additional tests.

First, we use the Index of Economic Freedom as an alternative proxy for the average quality of institutions. This index is provided by the Heritage Foundation on a yearly basis, and measures the basic institutions that aim to protect the freedom of individuals to pursue their own economic interests. Table 9 shows the system-GMM estimation results. We find no relevant differences with respect to the results shown in Table 7.

TABLE 9 HERE

To see if the accumulation of inward FDI over time has a relevant influence on the quality of institutions, we create two other FDI variables - lnCRFDI and lnCGFDI - to measure the amounts (in natural logarithms) of real and greenfield FDI projects, respectively, accumulated over a ten-year period. In particular, we consider the impact of real inward FDI flows accumulated between 1995 (2006) and 2005 (2016) on the quality of institutions in 2006 (2016). We also estimate the impact of cumulative greenfield FDI between 2003 (2010) and 2009 (2016) on the quality of institutions in 2010 (2016). We include all the other regressors measured in the years 2006 and 2016, respectively, as well as specific regional dummies, as in equation 1. We use a pooled OLS approach to estimate these relationships due to the limited number of observations.

Table 10 shows the results. All the estimated coefficients of inward FDI are positive and statistically significant: the higher the cumulative amount of FDI, the higher the average quality of domestic institutions in the recipient country. Although using the cumulative FDI may reduce potential simultaneity, we cannot exclude the possibility of the quality of a country's institutions (being persistent over time) increasing its ability to attract increasing amounts of FDI. In the absence of sound external instruments, we resort to Lewbel's (2012) approach, which exploits conditional second moments of the endogenous variables to account for endogeneity by circumventing the need for traditional instruments. Identification is based on a heteroscedastic

covariance restriction, i.e. on the presence of covariates correlated with the conditional variance of the first-stage errors, but not with the conditional covariance of heteroscedastic errors.

Table 10 also shows the estimated coefficients for cumulative real FDI inflows and greenfield FDI obtained using this instrumental variable approach (see the Appendix, Table A for the full estimates and related statistics). Since the cumulative FDI coefficients are all positive and highly significant, we posit that higher cumulative amounts of FDI induce an increase in the quality of domestic institutions.

TABLE 10 HERE

5 Conclusions

In this paper we examine whether and to what extent inward FDI affects the quality of institutions in recipient countries, an issue that has been less thoroughly analyzed than the opposite question of whether higher-quality domestic institutions attract more FDI. Considering a set of 127 countries and a period of 22 years, and using panel cointegration tests as well as pooled OLS, fixed-effects, and dynamic panel models, we find that higher amounts of inward FDI have a greater effect on the average quality of domestic institutions. This effect is stronger in developing and transition economies, when the FDI involves greenfield projects, and when the institutions considered have to do with regulatory quality, rule of law, and - to a lesser extent - political stability, and government effectiveness.

Our findings suggest that FDI and domestic institutions are mutually reinforcing factors: not only do higher-quality institutions help countries to attract more FDI, but FDI can in turn help recipient countries to improve their institutional quality. This particularly holds for transition and developing countries, most of which (unlike advanced economies) have recently experienced processes of liberalization, decentralization and democratization, together with institutional change. Intriguingly, we find no significant effect of inward FDI on control of corruption. This is consistent with the ambiguous role of FDI in either fostering or discouraging corruption, such that it may hinder a government's strong and effective control over this widespread phenomenon.

To conclude, not only do multinational firms benefit from a favorable business environment and/or cheaper production costs in foreign host countries, but they can also have an indirect positive influence on the latter's economies by boosting processes for their catch-up, modernization and structural change. That is why foreign investors may actually act as agents of institutional change.

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TABLES AND FIGURES

Table 1. Review of recent empirical studies concerning the influence of inward FDI on domestic institutions

Author	Dependent variable	FDI-related variables	Subjects and time-frame	Control for endogeneity	Conclusions	Effect on host country's institutions
Bayar (2011)	corruption (CPI)	FDI inflows as % of total fixed investment in the country	10 (ex URSS and East-Asia), 1999-2009	✓	Past levels of corruption and political rights are relevant causes of corruption in the sample examined, while other variables including FDI inflows seem to have no significant effect.	NOT REL
Cole et al. (2006)	environmental regulatory stringency (grams of lead content per gallon of gasoline)	lagged inward FDI stocks and flows scaled by GDP, interaction term between corruption and FDI	33 developed and developing countries, 1982-1992	✓	Inward FDI has a positive impact on the stringency of environmental regulations when the level of local government's corruptibility is low; at higher levels of corruptibility, this impact is lessened and eventually becomes negative.	VARIABLE
Craigwell & Wright (2011)	corruption (WB Statistics)	FDI as a share of GDP	42 developing countries, years 1998-2009	✓	When linear panel methods are used, the majority of the markets indicate a bidirectional causal link between FDI and corruption. In contrast, the link from FDI to corruption dominates in the nonlinear tests.	NEG

Kwok & Tadesse (2006)	corruption (CPI); also changes in levels of corruption in robustness checks	(past) FDI as a share of GDP in different time frames. The robustness checks also include the interaction between the FDI variable and education, and between FDI and cultural values	sample varying between 40 and 100 countries depending on the model; average of years 2000-2004	✓	Current corruption levels are significantly lower in countries with high FDI flows in the past. Harmful effects of culture on corruption are lower and the beneficial effects of education on corruption are higher in countries with more FDI in the past.	POS
Larrain B. & Tavares (2004)	corruption (ICRG)	gross FDI inflows as a share of GDP	a large cross-section of countries, years 1970-1994	✓	Higher FDI inflows significantly deter corruption.	POS
Lee & Lio (2016)	corruption and government performance (China Statistical Yearbook and the Procuratorial Yearbook of China)	amount of FDI as a share of GDP	China's provinces, years 2000-2009	✓	Foreign capital and investors improved governance performance and reduced corruption of Chinese provincial governments.	POS
Lin (2018)	freedom of speech	a dummy indicating whether an individual works in a foreign-invested enterprise	extensive individual surveys conducted in 28 provinces of mainland China, 2013	✓	Individuals working in foreign-invested enterprises (especially those not in Hong Kong, Macao and Taiwan) tend to be more in favor of freedom of speech than individuals working in firms without FDI.	POS

Lin et al. (2014)	3 dependent variables capturing Shanghai-based firms' COD discharges and SO2 emissions (SEPB)	firms with or without foreign control (dummy)	565 firms in Shanghai		Foreign-invested firms are more likely to comply with environmental regulations than firms with no international linkage because the former are motivated to improve their environmental compliance and also have the means to do so.	POS
Malesky (2008)	whether a province has engaged in an autonomous action in a given year (content analysis of state-owned Vietnamese newspapers)	stocks of FDI as a share of GDP	61 Vietnamese provinces, years 1990-2000	✓	FDI appears to have a powerful and robust impact on *de facto* decentralization regarding economic policy.	POS
Malesky (2009)	annual change in total economic reform (EBRD scores)	annual change in stock of FDI as a percentage of GDP	27 transition countries, years 1991-2004	✓	FDI has a positive and relevant impact on economic reforms in transition economies.	POS
Pinto & Zhu (2016)	corruption (CPI)	real FDI stock per capita (5-year average), interaction term between GDP per capita and FDI	95 countries, average 2000-2004	✓	The effects of inward FDI on corruption are expected to vary with local conditions in the host country. FDI is associated with higher levels of corruption in less developed countries, but not in developed countries.	VARIABLE

Polacheck et al. (2012)	military conflicts	dyadic FDI flows	29 OECD host countries and their source countries, for a total of 53 different countries	✓	A 10% increase in FDI is associated with a 3.3% increase in net cooperation.	POS
Robertson & Watson (2004)	corruption (CPI)	FDI per capita, change in level of inward FDI	From 88 to 99 countries, years 1999 and 2000		The faster the rate of change in FDI, the higher the level of corruption.	NEG
Wrana & Revilla-Diez (2016)	Vietnam's education system	German and Japanese MNE involved in local educational projects	Vietnam, interviews conducted in 2014		MNEs can influence regional education systems by introducing institutional elements of their home country's skill formation system.	POS
Zeng & Eastin (2012)	number of ISO 14001-certified facilities in a country that receives developing-world FDI	total inward FDI stocks as a share of GDP and of inward FDI from different areas	48 developed and developing countries, 1990–2005		Less-developed countries' MNEs find it increasingly financially advantageous to signal to consumers, investors, and potential business partners their commitment to environmental protection by adopting sound environmental practices.	POS

Table 2. Summary statistics and correlation matrix

	Mean	St.dev.	Min	Max	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. QGOV	0.516	0.147	0.232	0.828	1											
2. RFDI	6526.5	46065.3	0	1452963	0.343	1										
3. FDI/GDP	0.050	0.172	-0.589	4.996	0.164	0.001	1									
4. GRFDI	103.2	218.9	0	1933	0.407	0.575	-0.081	1								
5. POP	4.8e+07	1.57e+08	206963	1.38e+09	-0.275	0.315	-0.352	0.578	1							
6. DEN	179.9	602.2	1.479	6996.9	0.087	0.123	-0.010	0.219	0.138	1						
7. TRADE	0.853	0.492	0.156	4.426	0.272	-0.028	0.435	-0.101	-0.595	0.152	1					
8. INFL	0.092	0.319	-0.272	9.586	-0.368	-0.132	-0.046	-0.119	0.121	-0.134	-0.122	1				
9. UNEMP	0.087	0.063	0.001	0.393	0.067	0.018	0.065	-0.059	-0.114	-0.184	-0.023	-0.035	1			
10. IND	0.301	0.143	0.068	2.137	-0.112	0.050	-0.154	0.217	0.154	-0.242	-0.048	0.131	-0.143	1		
11. SERV	0.572	0.128	0.094	0.931	0.634	0.311	0.143	0.272	-0.191	0.235	0.173	-0.289	0.273	-0.477	1	
12. BROADTEL	0.265	0.263	0.001	1.021	0.675	0.373	0.081	0.522	-0.162	0.099	0.266	-0.216	0.095	0.119	0.584	1

Note: summary statistics refer to the variables before logarithmic transformation. Correlations refer to variables transformed into natural logarithms.

Table 3. Unit root and panel cointegration tests

	Im-Pesaran-Shin		*Augmented Dickey Fuller*		
Variable	**Statistic**	**p-value**	**Statistic**	**p-value**	**lags**
lnQGOV	1.8555	0.9682	-2.092	0.5505	1
	2.0019	0.9774	-0.854	0.9609	2
	1.0732	0.8584	-0.833	0.9628	3
ΔlnQGOV	-10.2300	0.0000	-4.087	0.0066	1
	-15.0252	0.0000	-3.219	0.0807	2
	-7.2099	0.0000	-2.433	0.3620	3
lnRFDI	-9.5685	0.0000	-2.488	0.3339	1
	-4.6795	0.0000	-1.027	0.9404	2
	-1.2689	0.1022	-1.083	0.9319	3
	-0.4894	0.3123	0.302	0.9963	4
ΔlnRFDI	-29.3806	0.0000	-4.853	0.0000	1
	-18.3494	0.0000	-3.419	0.0489	2
	-10.7700	0.0000	-3.670	0.0244	3
lnFDI/GDP	-8.7049	0.0000	-2.327	0.4190	1
	-3.8471	0.0000	-1.584	0.7988	2
	-2.0948	0.0001	-1.353	0.8741	3
	-1.1074	0.1341	-1.541	0.8146	4
ΔlnFDI/GDP	-28.1780	0.0000	-3.322	0.0627	1
	-15.9800	0.0000	-2.704	0.2344	2
	-9.6646	0.0000	-2.124	0.5327	3
	-4.4531	0.0000	-3.468	0.0430	4
lnGRFDI	-4.2776	0.0000	-0.366	0.9879	1
	0.2677	0.6055	0.225	0.9959	2
	0.0119	0.5048	-0.745	0.9700	3
ΔlnGRFDI	-14.1164	0.0000	-4.548	0.0013	1
	-4.5151	0.0000	-2.116	0.5369	2
	-2.4786	0.0066	-15.331	0.0000	3

Westerlund cointegration test			
Dep. variable	**Regressor**	**Variance ratio**	**p-value**
ΔlnQGOV	ΔlnRFDI	5.7448	0.0000
ΔlnQGOV	ΔlnFDI/GDP	5.7099	0.0000
ΔlnQGOV	ΔlnGRFDI	5.1168	0.0000
ΔlnRFDI	ΔlnQGOV	-10.2301	0.0000
ΔlnFDI/GDP	ΔlnQGOV	-7.4881	0.0000
ΔlnGRFDI	ΔlnQGOV	-3.0899	0.0010

Table 4. Inward FDI and quality of institutions: pooled OLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
lnRFDI	0.010***	0.010***				
	(0.002)	(0.002)				
lnFDI/GDP			0.015***	0.011**		
			(0.005)	(0.005)		
lnGRFDI					0.081***	0.077***
					(0.012)	(0.009)
lnPOP	-0.043***	-0.058***	-0.034***	-0.049***	-0.103***	-0.116***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.014)	(0.011)
lnDENS	0.007	0.006	0.007	0.006	0.002	0.007
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
lnTRADE	0.007	-0.033	0.001	-0.036	-0.037	-0.091***
	(0.027)	(0.025)	(0.028)	(0.026)	(0.032)	(0.023)
INFL	-0.040**	-0.052**	-0.051**	-0.064**	-0.290***	-0.254**
	(0.019)	(0.026)	(0.020)	(0.028)	(0.105)	(0.119)
lnUNEMP	-0.020	-0.024*	-0.023	-0.026*	-0.022	-0.023*
	(0.016)	(0.014)	(0.016)	(0.015)	(0.015)	(0.013)
lnIND	0.013	-0.003	0.025	0.008	-0.014	-0.043
	(0.033)	(0.029)	(0.033)	(0.031)	(0.041)	(0.036)
lnSERV	0.197***	0.195***	0.222***	0.225***	0.161**	0.139**
	(0.058)	(0.060)	(0.061)	(0.065)	(0.064)	(0.068)
lnBROADTEL	0.060***	0.044***	0.064***	0.048***	0.031*	0.010
	(0.017)	(0.013)	(0.017)	(0.013)	(0.017)	(0.013)
OECD	0.207***	0.204***	0.216***	0.211***	0.203***	0.186***
	(0.029)	(0.031)	(0.030)	(0.030)	(0.024)	(0.028)
UEMOA		0.075		0.082		0.106*
		(0.056)		(0.055)		(0.060)
COMESA_FTA		-0.109		-0.111		-0.117
		(0.110)		(0.111)		(0.104)
SADC		0.175***		0.176***		0.194***
		(0.053)		(0.054)		(0.045)
APEC		0.184***		0.178***		0.186***
		(0.046)		(0.045)		(0.048)
UNASUR		-0.051		-0.048		-0.020
		(0.039)		(0.041)		(0.035)
CACM		-0.021		-0.021		0.012
		(0.052)		(0.053)		(0.039)
NAFTA		-0.042		-0.026		-0.049
		(0.108)		(0.110)		(0.100)
ASEAN		-0.033		-0.032		-0.074
		(0.049)		(0.049)		(0.059)
MERCOSUR		0.085		0.083		0.091*
		(0.070)		(0.069)		(0.050)
EU_SCHN		0.139***		0.148***		0.128***
		(0.028)		(0.028)		(0.029)
Regional dummies	Yes	No	Yes	No	Yes	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2794	2794	2794	2794	1778	1778
Number of countries	127	127	127	127	127	127
R^2	0.799	0.765	0.797	0.761	0.841	0.815
Mean VIF	3.57	2.02	3.53	1.97	4.16	2.24

Notes: all the models include a constant term. Country-level cluster-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5. Inward FDI and quality of institutions: fixed-effects estimates

	(1)	(2)	(3)
lnRFDI	0.003***		
	(0.001)		
lnFDI/GDP		0.004*	
		(0.002)	
lnGRFDI			0.025***
			(0.006)
lnPOP	-0.217	-0.184	-1.820***
	(0.387)	(0.396)	(0.471)
lnDENS	0.132	0.096	1.691***
	(0.412)	(0.421)	(0.522)
lnTRADE	-0.011	-0.020	-0.040**
	(0.021)	(0.022)	(0.019)
INFL	-0.012	-0.015	-0.071***
	(0.011)	(0.011)	(0.022)
lnUNEMP	-0.007	-0.006	-0.016
	(0.012)	(0.011)	(0.011)
lnIND	0.024	0.029	0.053*
	(0.041)	(0.042)	(0.031)
lnSERV	0.029	0.029	0.037
	(0.043)	(0.044)	(0.033)
lnBROADTEL	-0.006	-0.002	0.011
	(0.008)	(0.009)	(0.010)
Area dummies	No	No	No
Year dummies	Yes	Yes	Yes
Number of observations	2794	2794	1778
Number of countries	127	127	127
Within R^2	0.063	0.056	0.165

Country-level cluster-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6. Inward FDI and quality of institutions: two-step SYS-GMM estimates

	(1)	(2)	(3)
$lnQGOV_{t-1}$	0.870***	0.981***	0.720***
	(0.071)	(0.102)	(0.086)
lnRFDI	0.004***		
	(0.001)		
lnFDI/GDP		0.001	
		(0.011)	
lnGRFDI			0.014*
			(0.008)
lnPOP	-0.021	-0.013	-0.064**
	(0.015)	(0.040)	(0.031)
lnDENS	-0.009	-0.020	0.029
	(0.016)	(0.100)	(0.026)
lnTRADE	-0.022**	-0.018	-0.032***
	(0.010)	(0.067)	(0.011)
INFL	0.000	-0.003	-0.006
	(0.006)	(0.015)	(0.012)
lnUNEMP	-0.002	-0.004	0.009
	(0.004)	(0.018)	(0.006)
lnSERV	0.015	0.013	0.000
	(0.015)	(0.104)	(0.020)
lnIND	0.024**	0.030	0.017
	(0.012)	(0.122)	(0.013)
lnBROADTEL	-0.005	-0.003	0.009*
	(0.006)	(0.072)	(0.006)
OECD	0.011	0.006	-0.007
	(0.011)	(0.112)	(0.016)
Area dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Number of observations	2,667	2,667	1,778
Number of countries	127	127	127
Number of instruments	129	129	85
AR (1)	0.000	0.000	0.000
AR (2)	0.6325	0.583	0.2306
Sargan	0.3191	0.1645	0.152

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7. Inward FDI and quality of institutions in advanced countries: one-step SYS-GMM

	Advanced countries		
$lnQGOV_{t-1}$	0.836***	0.772***	0.754***
	(0.047)	(0.052)	(0.052)
lnRFDI	0.001***		
	(0.000)		
lnFDI/GDP		-0.000	
		(0.001)	
lnGRFDI			0.002
			(0.005)
N of countries	25	25	25
	Transition economies		
$lnQGOV_{t-1}$	0.890***	0.844***	0.788***
	(0.045)	(0.035)	(0.055)
lnRFDI	0.000		
	(0.001)		
lnFDI/GDP		0.004*	
		(0.002)	
lnGRFDI			0.032***
			(0.009)
N of countries	25	25	25
	Developing countries		
ln_QGOV_{t-1}	0.936***	0.939***	0.810***
	(0.033)	(0.041)	(0.064)
lnRFDI	0.005***		
	(0.002)		
lnFDI/GDP		0.003	
		(0.002)	
lnGRFDI			0.024***
			(0.009)
N of countries	77	77	77

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All the estimates include the following additional regressors: lnPOP, lnDENS, lnTRADE, lNFL, lnUNEMP, lnSERV, lnIND, lnBROADTEL and OECD. All the estimates also include regional and year fixed effects. The full set of estimates is available on request.

Table 8. FDI and the six dimensions of institutional quality: one-step SYS-GMM

Voice & Accountability	*Transition economies*	*Developing countries*
lnRFDI	0.003	-0.001
	(0.002)	(0.003)
lnFDI/GDP	0.001°°	-0.009
	(0.003)	(0.005)
lnGRFDI	0.027**	0.014
	(0.013)	(0.017)
Political Stability		
lnRFDI	-0.004	0.013**
	(0.004)	(0.006)
lnFDI/GDP	0.013	0.013°°°
	(0.015)	(0.011)
lnGRFDI	0.091*	0.071*
	(0.051)	(0.040)
Government Effectiveness		
lnRFDI	0.001	0.001
	(0.002)	(0.002)
lnFDI/GDP	0.001°°°	0.003°°
	(0.004)	(0.002)
lnGRFDI	0.016	0.019*
	(0.016)	(0.011)
Regulatory Quality		
lnRFDI	0.002	0.007**
	(0.003)	(0.003)
lnFDI/GDP	0.011*	-0.008°°°
	(0.006)	(0.005)
lnGRFDI	0.039***	0.033
	(0.014)	(0.021)
Rule of Law		
lnRFDI	0.001	0.002
	(0.002)	(0.003)
lnFDI/GDP	-0.002	-0.001°°
	(0.003)	(0.003)
lnGRFDI	0.046***	0.029**
	(0.013)	(0.012)
Control of Corruption		
lnRFDI	0.001	0.002
	(0.002)	(0.003)
lnFDI/GDP	-0.003	0.005
	(0.002)	(0.003)
lnGRFDI	0.010	0.005
	(0.010)	(0.011)

Robust standard errors in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$; °° *p<0.05* with lnFDI/POP, °°°*p<0.01* with lnFDI/POP.

Table 9. The impact of inward FDI on the Index of Economic Freedom: one-step SYS-GMM

	Transition economies			*Developing countries*		
	(1)	(2)	(3)	(4)	(5)	(6)
$lnECFR_{t-1}$	0.763***	0.798***	0.726***	0.970***	0.936***	1.022***
	(0.050)	(0.058)	(0.074)	(0.037)	(0.040)	(0.048)
lnRFDI	0.002			0.001		
	(0.002)			(0.002)		
lnFDI/GDP		0.000			0.002°°	
		(0.005)			(0.003)	
lnGRFDI			0.013*			0.025**
			(0.008)			(0.011)
Area dummies	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	25	25	25	77	77	77

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, °° *p<0.05* with lnFDI/POP. The estimated coefficients of the other regressors are omitted to save space. The full estimates are available on request.

Table 10. Cumulative FDI and quality of institutions

Dependent variable	Cumulative FDI	Pooled OLS	Lewbel IV approach
$lnQGOV_{2006}$	$lnCRFDI_{1995-2005}$	0.043***	0.034***
(N=127)		(0.011)	(0.007)
$lnQGOV_{2010}$	$lnCGFDI_{2003-2009}$	0.091***	0.063***
(N=77)		(0.025)	(0.013)
$lnQGOV_{2016}$	$lnCRFDI_{2005-2016}$	0.036***	0.033***
(N=127)		(0.011)	(0.007)
$lnQGOV_{2016}$	$lnCGFDI_{2010-2016}$	0.116***	0.119***
(N=77)		(0.019)	(0.012)
Area dummies		Yes	Yes
Time dummies		Yes	Yes

Cluster-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$**.** The estimated coefficients of the other regressors are omitted to save space. The full estimates are available in the Appendix, Table A.

Figure 1. Average quality of institutions between 1995 and 2016

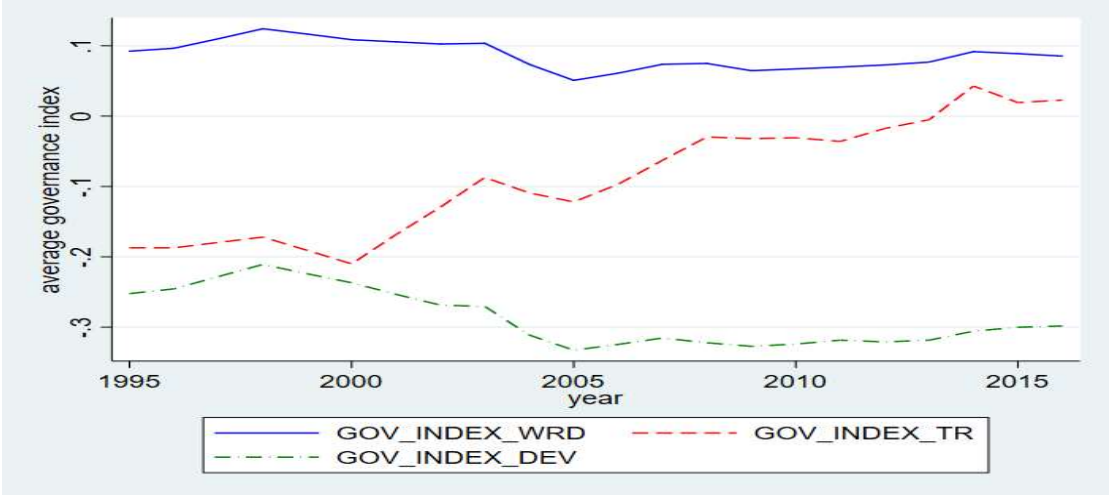
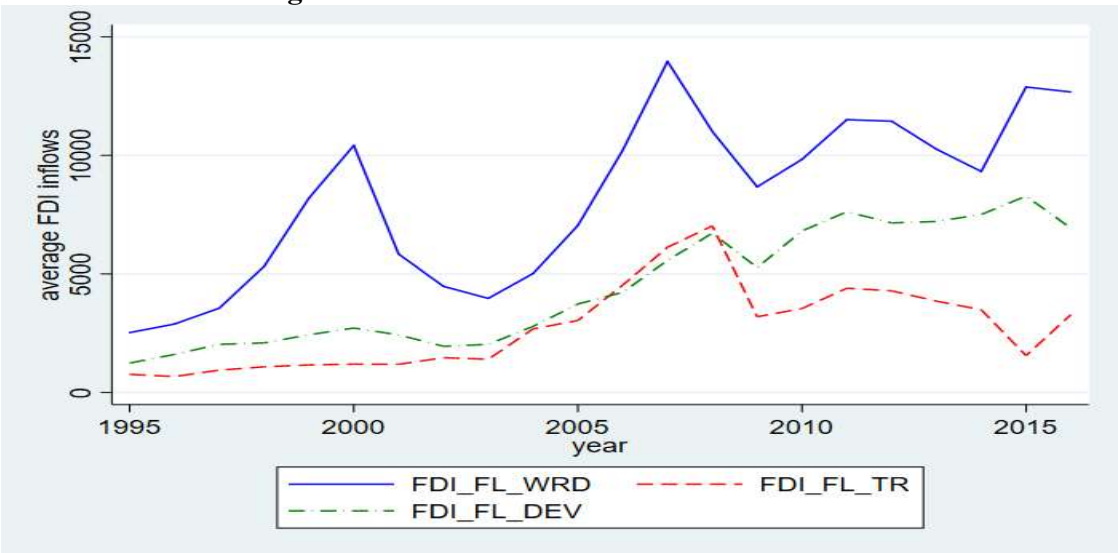


Figure 2. FDI inflows between 1995 and 2016



Appendix

Table A.1 List of countries

Advanced economies	Transition economies	Developing economies		
Australia	Albania	Algeria	Gambia	Morocco
Austria	Armenia	Argentina	Ghana	Mozambique
Belgium	Azerbaijan	Bahrain	Guatemala	Namibia
Canada	Belarus	Bangladesh	Guinea	Nepal
Cyprus	Bosnia and Herzegovina	Barbados	Guyana	Nicaragua
Denmark	Bulgaria	Belize	Honduras	Nigeria
Finland	Croatia	Benin	Hong Kong	Pakistan
France	Czech Republic	Bhutan	India	Panama
Germany	Estonia	Bolivia	Indonesia	Paraguay
Greece	Georgia	Botswana	Iran	Peru
Iceland	Hungary	Brazil	Jamaica	Philippines
Ireland	Kazakhstan	Burkina Faso	Jordan	Qatar
Italy	Kyrgyz Republic	Cabo Verde	Kenya	Rwanda
Japan	Latvia	Cambodia	Korea, Rep.	Saudi Arabia
Luxembourg	Lithuania	Cameroon	Kuwait	Senegal
Malta	Macedonia	Chad	Laos	South Africa
Netherlands	Moldova	Chile	Lebanon	Sri Lanka
New Zealand	Poland	China	Lesotho	Tanzania
Norway	Romania	Colombia	Madagascar	Thailand
Portugal	Russia	Costa Rica	Malawi	Tunisia
Spain	Slovakia	Cote d'Ivoire	Malaysia	Turkey
Sweden	Slovenia	Ecuador	Mali	Uganda
Switzerland	Tajikistan	Egypt	Mauritania	Uruguay
United Kingdom	Ukraine	El Salvador	Mexico	Venezuela
United States	Uzbekistan	Ethiopia	Mongolia	Vietnam
				Zambia
				Zimbabwe
Total: 25	Total: 25	Total: 77		

Table A.2 Description of variables

	Description	Source
	Dependent variables	
QGOV	Quality of governance (average of the six WGI)	World Bank's Worldwide Governance Indicators (WGI) dataset
	Voice & Accountability	World Bank's WGI dataset
	Political Stability	World Bank's WGI dataset
	Government Effectiveness	World Bank's WGI dataset
	Regulatory Quality	World Bank's WGI dataset
	Rule of Law	World Bank's WGI dataset
	Control of Corruption	World Bank's WGI dataset
	Index of Economic Freedom	Heritage Foundation's Index of Economic Freedom dataset
	Focal regressor	
RFDI	real FDI inflows (FDI inflows in million dollars/annual GDP deflator)	UNCTAD FDI Statistics (numerator) and World Bank's World Development Indicators (denominator)
FDI/GDP	FDI inflows/GDP	UNCTAD FDI Statistics
GRFDI	number of greenfield FDI projects	FDI Markets Dataset - Financial Times Ltd
	Other regressors	
POP	total population	World Bank's World Development Indicators (WDI) dataset
DEN	population density (per km^2 of land area)	
TRADE	trade openness (sum of imports and exports of goods and services as % of GDP)	authors' elaboration based on WDI dataset
INFL	inflation, GDP deflator (annual %)	WDI dataset
UNEMP	total unemployment (as % of total labor force)	WDI dataset
SERV	value added of services (as % of GDP)	WDI dataset
INDUS	value added of industry (as % of GDP)	WDI dataset

BROADTEL	fixed broadband subscriptions (per 100 population)+ landline telephone subscriptions (per 100 population)	authors' elaboration based on WDI dataset
UEMOA	being a member of UEMOA (Union Economique et Monétaire Ouest Africaine)	
COMESA_CFTA	being a member of COMESA (Common Market for Eastern and Southern Africa) and/or CFTA Continental Free Trade Area)	
SADC	being a member of SADC (Southern African Development Community)	
APEC	being a member of APEC (Asia-Pacific Economic Cooperation)	
UNASUR	being a member of UNASUR (Union of South American Nations)	
CACM	being a member of CACM (Central American Common Market)	
NAFTA	being a member of NAFTA (North American Free Trade Agreement)	
ASEAN	being a member of ASEAN (Association of Southeast Asian Nations)	
MERCOSUR	being a member of MERCOSUR (Mercado Común del Sur)	
EU_SCHN	being a member of the EU (European Union) and/or of the Schengen area	
OECD	being a member of the OECD (Organisation for Economic Co-operation and Development)	

Table A.3. Cumulative FDI and quality of institutions: Lewbel's IV approach

Dependent variable	$lnQGOV_{2006}$	$lnQGOV_{2016}$	$lnQGOV_{2010}$	$lnQGOV_{2016}$
	(1)	(2)	(3)	(4)
$lnCRFDI_{1995-2005}$	0.034***			
	(0.007)			
$lnCRFDI_{2006-16}$		0.033***		
		(0.007)		
$lnCGFDI_{2003-09}$			0.063***	
			(0.013)	
$lnCGFDI_{2010-16}$				0.119***
				(0.012)
lnPOP	-0.069***	-0.777***	-0.098***	-0.152***
	(0.009)	(0.013)	(0. 015)	(0.016)
lnDENS	-0.011	-0.016*	0.005	0.01
	(0.007)	(0.009)	(0.007)	(0.008)
lnTRADE	-0.039	-0.04	-0.03	-0.088**
	(0.029)	(0.036)	(0.028)	(0.036)
lnINFL	-0.078	-0.103	-0.357*	-0.08
	(0.213)	(0.274)	(0.197)	(0.172)
lnUNEMP	-0.034*	-0.028	-0.033**	-0.017
	(0.018)	(0.020)	(0.016)	(0.015)
lnIND	0.071*	0.141***	0.028	0.018
	(0.028)	(0.042)	(0.038)	(0.036)
lnSERV	0.253***	0.392***	0.344***	0.19**
	(0.078)	(0.098)	(0.090)	(0.082)
lnBROADTEL	0.079***	0.006	0.048**	-0.003
	(0.016)	(0.02)	(0.02)	(0. 013)
OECD	0.135***	0.178***	0.194***	0.195***
	(0.033)	(0.033)	(0.290)	(0.03)
Area dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Number of observations	127	127	127	127
Kleibergen-Paap rk Wald F	5.838	564.107	37.73	4013.971
Hansen p-value	0.724	0.182	0.042	0.071

Cluster-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.