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WHAT DRIVES FDI POLICY LIBERALIZATION? AN EMPIRICAL INVESTIGATION

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What Drives FDI Policy Liberalization? An Empirical Investigation

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Abstract: Do countries compete for FDI by liberalizing their FDI policy regimes? Our measure of FDI policy liberalization is an event count of changes made by a country in a given year in the areas of approval procedures, sectoral restrictions, operational conditions, incentives, investment guarantees, foreign exchange, and corporate regulations to attract FDI. Using spatial econometric estimations on panel data for 148 countries during the 1992–2009 period, we find that favorable policy changes to the FDI regime in one country are positively correlated with FDI policy changes elsewhere (i.e., policy changes favorable to FDI from other countries, increase the likelihood of liberalizing FDI policy in the country in question). While low income countries compete among themselves for investment via the liberalization of FDI policy, competition is most fierce in those countries which are relatively more open to FDI. These results are robust to alternative weighting schemes, estimation methods, sample sizes, and controlling for the possibility of endogeneity.

Keywords: FDI policy liberalization, spatial econometrics (C33, C26, F21).

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1. Introduction

Do nation states compete for Foreign Direct Investment (FDI hereafter) by altering laws and regulations governing FDI policy? While there is much anecdotal evidence to suggest that they do, surprisingly enough, to the best of our knowledge there is no empirical evidence to support these claims. The present paper fills this gap in the international political economy literature by specifically looking at competition among countries in liberalizing FDI laws and regulations related to foreign ownership, approval procedures, sectoral restrictions, operational conditions, incentives, investment guarantees, foreign exchange, and corporate regulations. It is often argued that globalization gives *footloose* capital greater bargaining power while placing host country governments under pressure to liberalize laws and regulations governing FDI policy, thus leading to competition between countries to attract FDI. Countries also compete for FDI because it can yield a number of benefits for host countries, including the development of infrastructure, technology transfer, promotion of institutions conducive to economic growth, and improvements in managerial knowledge and the level of skill among the human capital stock – all necessary for a country to compete in global markets (Dunning 1993). The main underlying argument here is that entrepreneurial politicians respond to capital mobility through a process of regulatory and incentive based competition, with the expectation that FDI creates job opportunities raising wages. This forms a huge political capital for incumbent politicians. Although competition for mobile capital is present among developed and developing countries, we believe that it is developing countries which compete more fiercely among themselves, as well as with developed countries, to attract FDI. Developed countries are not pushed as hard as developing countries to compete for mobile capital because they possess better infrastructure facilities and property rights protection, as well as stronger institutions and a more educated work force. This

reduces the cost of conducting business, making them attractive destinations for FDI in the long run (Ahlquist 2006).

Previous studies on the liberalization of FDI policy have examined the effects of openness (Asiedu and Lien 2004, Biglaiser and DeRouen 2007), tax incentives (Banga 2006), administrative barriers (Morisset and Neso 2002) and deregulation (Golub 2003, Gastanga et al. 1998) to attract FDI. Although Korbin (2005) attempts to study the basic determinants of the liberalization of FDI policy, curiously, the key aspect of inter-country competition has yet to be explored. In this paper, we use spatial econometrics to examine whether changes in FDI laws and regulations which are favorable to attracting FDI in one country, are influenced by favorable changes in FDI policy elsewhere. We also examine if such competition is evident both within group as well as across various groups of countries.

Spatial econometrics has been used in the literature to explore the extent of competition in tax, environmental standards, economic policy reforms, bilateral investment treaties and labor standards, among others. Some of the initial studies that have used spatial econometrics to examine tax competition among developed countries include those by Davies, Egger and Egger (2003), Devereux, Lockwood, and Redoano (2008), Davies and Voget (2008), Overesche and Rinke (2008) and Klemm and van Parys (2009). Davies and Vadlamannati (2011) also use spatial econometrics to examine the extent of competition in labor standards among nation states to attract FDI and trade. Neumayer and de Soysa (2011) use a similar technique with a different weighting matrix and find support for a race to the top with respect to women's labor rights. Spatial econometrics is additionally used by Markusen, Morey and Olewiler (1995), Fredriksson and Millimet (2002), Beron et al. (2003), Murdoch et al. (2003), Davies and Naughton (2006) and Perkins and Neumayer (2010) to explore the race to the bottom argument in the adoption of environmental agreements and policies. This form of econometrics has also been used in studies measuring the extent of diffusion of

policy liberalization and investment treaties. For example, Pitlik (2007) and Gassebner, Gaston and Lamla (2011) find evidence of competition among countries to liberalize regulatory, monetary and trade policies, while Simmons and Elkins (2004) find that the adoption of economic practices is highly clustered, both temporally and spatially. Using subnational data in Germany, Potrafke (2012) finds that economic liberalization in one state is influenced by economic liberalization in a neighboring state. Simmons, Elkins, and Guzman (2004) also find that inter-country competition drives the signing of bilateral investment treaties[1].

While most of these studies are cross-country analyses, to the best of our knowledge there is no evidence for competition among countries to liberalize FDI policy regimes in order to make the host destination more attractive to FDI. Our paper attempts to fill this gap by specifically focusing on competition among countries to attract FDI through liberalizing FDI policy regimes, further examining whether this competition is any different within and between developing and developed countries. Using information on changes in FDI laws and regulations in 148 countries during the 1992–2009 period, we find that changes in FDI laws and regulations which are favorable to FDI in one country, are positively correlated with the liberalization of FDI policy in other countries. Furthermore, we find that developing countries compete for FDI by relaxing FDI regulations more fiercely among themselves. On the other hand, we also find that the competition is intense in the countries which are relatively more open to FDI. Our results remain robust to an alternative weighting scheme and controlling for endogeneity. We interpret these results as direct evidence of interstate strategic interactions in the liberalization of FDI policy. It is beyond the scope of this study to examine whether such fierce competition among countries actually leads to a race to the bottom, or otherwise. We

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[1] There are also other areas where spatial econometrics has been used. For instance, Cho, Dreher and Neumayer (2011) use it to examine the diffusion of anti-trafficking government policies. Also, Cao (2010) examining policy diffusion in taxation finds that the competition mechanism induced by network position similarity in the network of portfolio investment and that of exports causes policy diffusion in corporate taxation.

leave it to a future research agenda to examine whether competition among states results in race to the bottom or race to the top.

The rest of the paper is structured as follows. Section 2 illustrates the reasons as to why countries compete for FDI. Section 3 describes the data used and the spatial econometric methodology in detail. Section 4 discusses the results and section 5 concludes.

2. Theory and Hypothesis

The 1990s witnessed a marked increase in economic integration which resulted in a dramatic increase in FDI inflows into developing countries. It is estimated that FDI inflows into developing countries during 1990s increased by about 520% (UNCTAD 2004). This increase was a consequence of widespread liberalization of FDI laws and regulations. According to Kobrin (2005), the 1992–2001 period witnessed roughly 1029 changes in policies favorable to FDI in developing countries alone. While many developing countries started to frame policies in favor of FDI and reduce regulations for the entry of foreign firms in the 1990s, this trend became even more pronounced in the 2000s. Using a different measure of changes in FDI policy, Pandya (2010) finds that a median country, protecting about 40% of its industries from the entry of foreign firms in the 1970s, dropped its protection to about 12% by the end of 2000. These drastic changes in policies favoring FDI are a significant reversal from the 1970s and 1980s as the general consensus until the 1980s was that economic incentives had an ambiguous effect on economic growth, or no impact at all (Peters and Fisher 2004, Markusen and Nesse 2006). Subsequent studies have shown that tax and other incentives have a significant effect on regional growth (Bartik 1993, Phillips and Gross 1995, Newman and Sullivan 1988). Moreover, traditional economic growth theory highlights the importance of investment in attaining higher rates of economic growth (Barro and Sala-i-Martin 2004).

The advent of the democratization process in the 1990s, with a large number of countries adopting free market economic policies, paved the way for competition between countries to attract investment. Along with basic economic and governance issues, attracting investment and job creation became a key priority for many governments in the post-reform period in the 1990s (Markusen and Nesse 2006). Thus, governments today are forced to compete against each other to attract investment, which would not only generate jobs and boost their economies, but also form huge political capital for incumbent politicians. Even some autocratic governments have been forced to liberalize their investment policy regime to stave off anti-government revolts. China's aggressive liberalization of FDI policy following the post-Tiananmen square crackdown is one such example.

In fact, stylized theory in terms of the rewards of competing for investment can be derived from basic international trade models such as the 'Heckscher-Ohlin–Samuelson theory', the 'Ricardo-Viner model', and the 'ideology and inequality thesis' proposed by Dutta and Mitra (2006), which all predict that trade will extensively benefit those countries with abundant factors of production compared to those with scarce factors. Extending the same analogy to the liberalization of FDI policy suggests that workers and farmers in poor countries will gain from the process of liberalization, where domestic capitalist rent-seeking forces are forced to compete with new foreign capital. Since developing countries are labor rich and capital poor, their openness to foreign investment is expected to benefit labor, while hurting domestic rent-seeking capitalists (see Pandya 2011 for similar arguments). Foreign investment can provide significant benefits for labor by creating better quality jobs that are associated with an increase in wages and better working conditions compared to those offered by existing local firms, thus resulting in a higher marginal revenue product of labor. Competing with foreign firms operating at a higher level of labor productivity in turn forces domestic firms to increase wages (see Pandya (2010), for example). Note that previous

literature finds a positive impact of FDI and wage increases in both developing and developed countries (Huttunen 2007, Almeida 2007, Girma and Görg 2007, Aitken et al. 1996, Haddad and Hairrson 1993).

In addition, workers and consumers could gain when goods become cheaper and access to better quality goods increases. As large sections of the middle class stand to gain, the electorate would prefer those governments which support capital importation (Jakobsen and de Soysa 2006, Bhagwati 1999). The decision to allow FDI into the multi-brand retail sector by the Indian government in 2011 is a prime example of this. While farmers and agricultural labor associations openly supported opening up the retail sector to foreign investment, anticipating an increase in wages, this created back-end supply chain networks in the farming sector which eliminated middlemen and reduced product prices, which was vociferously opposed by lobby groups in domestic small scale industries (see Subramanya 2011, The Economist 2011). Moreover, competition theorists' argue that incentive competition not only creates jobs, but also increases the tax base of host countries. New jobs created by FDI also lead to skill acquisition, a transfer of managerial skills, and lower unemployment in host countries (Markusen and Nesse 2006). These benefits, in turn, are expected to spill over to domestic firms leading to improved productivity, innovation in local markets and an increase in exports. It is also noteworthy that even if FDI does not flow in as a result of a country's provision of various incentives and deregulation, if the incumbent government believes that it does, then this alone could result in incentive competition among countries.

The other important change driving inter-state competition is the failure of state-led development policies in developing countries, which has led to free market economic systems and increased the bargaining power of FDI vis-à-vis governments. Because of these profound changes, countries which would be better off colluding to reduce the size of incentives

offered to investors, i.e., so that there are net benefits to both investors and host countries, a country has the incentive to deviate from colluding, and offer incentives to investors individually. Due to the *footloose* nature of capital on the one hand, and competitive international political systems on the other, individual governments are left with no choice but to compete with their peers. This can result in *bidding wars,* leading to a *prisoner's dilemma* situation forcing states to compete aggressively to attract FDI through policy liberalization measures and the provision of various incentives for mobile firms. In fact, successive governments in many developing countries started to deregulate their FDI policies throughout the 1990s in their bid to attract FDI and signal to the investors after their competitors have done so. This type of fierce competition puts more pressure on smaller countries with even weaker bargaining power to follow suit to retain and attract mobile capital. Simmons and Elkins (2004) allude to the case of Chile in Latin America, who liberalized capital controls, subsequently leading to a wave of capital account liberalization in other countries in the region. Based on our discussion, we test the following hypothesis:

Hypothesis 1: *Potential host countries are more likely to change FDI laws and regulations favoring FDI when their competitors have done so.*

A related issue that has not been explored is the nature of this competition between countries. Foreign investors are encouraged to set up in countries with strong economic fundamentals. Among the reasons put forward are market size, the level of income, skill level in the host country, infrastructural facilities, and political and economic stability (Blomstrom and Kokko 2003). Usually it is argued that developing nations offer an environment less conducive to FDI inflows compared to developed nations. In such instances, the lack of infrastructure, skilled labour, property rights, and political and economic stability can be compensated for through fiscal incentives. According to Madies and Dethier (2010), more than 70% of African countries use tax holidays as an incentive to attract FDI, compared to

only 20% of OECD countries. Azemar and Delois (2008) argue that the level of statutory tax rates strongly influence the destination of Japanese firms, and may allow a country to compensate for disadvantages related to public good provision or governance. However, the influence of corporate taxes decreases with a high provision of public goods and better quality of public governance. Similarly, Haufler and Wooton (1998) show that that foreign investors prefer to locate in larger countries providing a higher producer price, even in the presence of higher tax levels. Imperfect competition leads small countries to offer lower tax rates relative to large countries in order to compensate for their small market size (Raff and Srinivasan 1997, Haufler and Wooton 1998). Accordingly, we expect that the *nature* of FDI competition is fiercer in developing countries vis-à-vis developed countries. We therefore test:

Hypothesis 2: *Competition to attract FDI via the liberalization of FDI policy is fiercer among developing countries.*

3. Data and Methods

3.1 Model Specification

We use panel data covering 148 countries over the 1992–2009 (18 years) period. The baseline specification estimates the number of annual changes in FDI laws and regulations (which we describe in detail below) affecting inflows of FDI into country i in year t, which is a function of a set of exogenous variables Z_{it}:

$$FDI \ Policy_{it} = \phi_i + \beta Z_{it} + \omega_{i_t} \qquad (1)$$

ϕ_i is the country specific dummy and ω_{i_t} is the error term. The control variables are drawn from the existing FDI literature and are described below. We now include competition with other countries by introducing the number of annual changes in FDI laws and regulations in

other countries in year t to the baseline specification (1), a variable known in the spatial econometric literature as the spatial lag. We thus estimate:

$$FDI\ Policy_{it} = \phi_i + \rho \sum_{j \neq i} \varpi_{jit}\ FDI\ Policy_{it} + \beta Z_{it} + \omega_{it} \qquad (2)$$

Where, $\sum_{j \neq i} \varpi_{jit}\ FDI\ Policy$ is the spatial lag, i.e., the weighted average of the number of annual changes in FDI laws and regulations in other countries. With respect to the weighting, we use $\varpi_{ijt} = \dfrac{GDP_{jt}}{\sum_{k \neq i} GDP_{kt}}$, i.e., the share that country i gives to country j is equivalent to j's share of the total GDP across all countries in our sample, excluding country i.[2] Note, however, that the sum of the weights across the other countries for country i will equal 1. Following this weighting procedure assumes that big countries (such as the USA, Japan, China, and so on) receive larger weights. We make use of GDP as the weight for two specific reasons. First, one might anticipate that country i pays more attention to what is taking place in large countries rather than small ones. Second, and more importantly, when the goal of liberalizing the foreign investment policy regime is to attract FDI, this will then depend on the elasticity of investment to a given country's changes in its foreign investment policy regime. Thus, if country j (for example China, which is the largest recipient of FDI inflows) is more attractive to FDI relative to country k, then changes in the FDI policy regime in j (China) will have a larger impact on the FDI policy regime in country i than a comparable change in k. This, in turn, would make country i (Malaysia) more responsive to j's (China's) changes in its FDI policy regime than to those of k. This is precisely the difference that equation (2) captures by assigning a larger weight to country j. In fact, there is a large FDI literature which shows that FDI is attracted to larger countries (see Blonigen 2005), which would imply a greater sensitivity on the part of country i to the changes in the FDI policies of

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[2] "Row standardization" is a common procedure where the sum of the weights adds up to one.

a large country. Moreover, the literature using spatial econometrics to examine cross-country competition has also used GDP as a weight (e.g., Davies and Vadlamannati 2011, Vadlamannati 2011, Devereux, Lockwood, and Redoano, 2008, Madariaga and Poncet 2007, Pitlik 2007).

We include country fixed effects to control for unobserved country specific heterogeneity in the panel dataset. We also include a time trend to capture other key reform measures taking place in each country. The time trend also captures factors which are not accounted for in the models, such as efficiency gains through technological advancements or enhanced management skills, which grow over time and can have a positive correlation with changes in FDI policy regimes. As the dependent variable here is a count of the number of annual changes in FDI laws and regulations, the preferred estimates are those from the maximum likelihood, zero-inflated negative binomial regression method (Brandt et al. 2000 and King 1988) with heteroskedasticity consistent robust standard errors (Beck and Katz 1995). It is noteworthy that our dependent count variable not only exhibits a distribution that is strongly skewed to the right (accumulation of observations at zero), but also shows over-dispersion (variance being greater than the mean - see descriptive statistics in Appendix 2) with excess zeros (zeros represent about 40%). To counter these problems, we make use of the zero-inflated, negative binomial method (Lambert 1992, Greene 1994).

3.2 Data

We use annual data for 148 countries from 1992 to 2009. Appendix 1 includes the list of countries used in our study. For the dependent variable, we make use of the number of annual changes in FDI laws and regulations which are favorable to FDI, which is the aggregation of changes occurring in the following categories: (a) Foreign ownership, (b) Approval procedures, (c) Sectoral restrictions, (d) Operational conditions, (e) Incentives, (f) Guarantees or protections, (g) Foreign exchange, and (h) Corporate regulations. The details

for each of these categories are described in appendix 2. This data is generated by UNCTAD, which has been collecting the information on annual changes in the FDI policies of respective countries since 1992. UNCTAD collects this information for its annual World Investment Reports, which monitor and analyze global and regional policy trends affecting FDI flows. As an initial step, UNCTAD collects these data from various sources ranging from the media and private consulting firms, to official government sources such as investment promotion agencies or respective ministries. In the second step, this information is sent to the respective government ministries for proper verification. Upon verification, if revisions are warranted, then changes are made to the data. In a final step, the changes are categorized according to the eight relevant categories listed above. It is noteworthy that our dependent variable is the count of changes in FDI laws and regulations which are favorable to FDI in all eight categories combined. Unfortunately, UNCTAD does not provide disaggregated data on each of the eight categories. It is, however, important to note that changes in FDI laws and regulations reflect the mere openness to FDI and not the degree of openness at that particular point in time. With this caveat in mind, we use this dataset with the intention of capturing broader trends reflecting changes in FDI policy regimes across countries.

Figure 1 captures the the evolution of the liberalization of FDI policy across the 148 countries analyzed over the 1992–2009 period. As one can see, the number of annual changes in FDI laws and regulations saw a steady increase during the mid to late 1990s, and then declined towards the end of 2009. This trend is also broadly reflected among developing countries (in red bars). On the other hand, despite being low, the liberalization of FDI policy among developed countries remained fairly constant over the years. On average, the number of policy changes carried out by a median developing country was below 0.5 in 1992. This increased to almost1.5 during 2002, and remained at just 0.5 in 2009. By contrast, the number of changes carried out by a median developed country always remained below 0.5 during our

study period. Thus, much of the changes in FDI laws and regulations in our sample period are largely driven by developing countries and not by developed countries. Figure 2 provides a geographic breakdown of the number of changes in FDI laws and regulations over the 1992–2009 period. As seen, Southeast Asia has witnessed the majority of the changes in FDI policy, at 21.3% (494 changes) of the total share, followed by post-Soviet transition countries, at 18.8% (about 435 changes). Sub-Saharan Africa and the Middle East/North Africa accounted for roughly 14% each, with 335 and 331 policy changes, respectively. Developed countries, comprising of Europe, Australia, New Zealand, Canada and the USA, saw 378 policy changes in their FDI laws and regulations, which is about 16.3% of the total changes registered worldwide. South Asia saw the least number of changes at 104, which is roughly 4.5% of the total share. It is noteworthy that many of the changes in South Asia and Southeast Asia are driven by India and China, respectively.

With respect to the control variables, we follow other studies on determinants of FDI - Blonigen (2005), Chakrabarti (2001), Wheeler and Moody (1992) - and other comprehensive evaluations of the liberalization of FDI policy (Kobrin 2005). Accordingly, we include GDP per capita, measured in 2000 US$ constant prices (logged), as a proxy for the level of development in the host country. It has been argued in the literature that the benefits accruing from FDI are conditional upon higher levels of absorptive capabilities (Borensztein et al. 1998) and are thus more likely to benefit from FDI liberalization. Likewise, we control for the rate of growth in GDP of the respective host countries, which might be associated with the liberalization of FDI policy. We also include total labor force (logged) as a proxy for the support for new investments which are expected to push wages upwards. Following others, we incorporate a measure of democracy which takes the value 1 if Marshall and Jaggers (2002) polity IV index is equal or above +6 on the scale of -10 to +10, with higher values

representing a greater level of democracy[3] (Robertson and Teitelbaum 2011, Pandya 2010).

In addition to these variables, we include oil export dependency, which is expected to have a

negative effect on the liberalization of FDI policy. Oil wealth is a dummy variable taking the

value 1 if oil exports exceed one-third of export revenue, and 0 otherwise. We also include a

variable capturing the ideology of the incumbent government. Many studies have found

ideology to be a key determinant of market economic liberalization process (Bjørnskov and

Potrafke 2012, Bjørnskov and Potrafke 2011). The data on ideology comes from Beck et al.

(2001), which are coded as a value of 1 for leftist governments in power, and 0 otherwise.

Finally, using the dataset developed by Dreher et al. (2009), we include a dummy using the

host country's participation in the IMF structural adjustment program as a proxy for external

pressures to deregulate and liberalize the existing FDI policy regime (Kobrin 2005). The

details on definitions and data sources are provided in appendix 3.

3.3 Endogeneity concerns

The spatial lag variable is bound to be endogenous because if the liberalization of FDI

policy in country i depends on that of country j, then the reverse is also true. In order to

address this endogeneity problem, we utilize a non-linear instrumental variable estimation.

For the instruments, we use $\sum_{j \neq i} \varpi_{jit} Z_{jt}$, i.e., the weighted average of the other countries'

control variables, namely GDP per capita (log), the GDP growth rate, labor force,

democracy, the oil exports dummy, government ideology, and IMF program participation.

The intuition behind using these variables is twofold. First, economic and political factors are

found to be a very important force driving the liberalization of FDI policy. Second, for a

given country j, these exogenous variables directly impact its FDI policies, but are not

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[3] Though Polity IV index has faced some criticism, it captures three important elements of democracy namely, presence of institutions, existence of effective constraints on executive and participation in political process, which are found to be key for economic openness (Henisz and Manfield 2006).

dependent on those in country *i,* thus satisfying both the instrument relevance and exclusion criteria.

Employing two-stage instrumental variable estimations (2SLS–IV) for non-linear models such as zero-inflated negative binomial may be problematic, and the relevant parameters are difficult to estimate directly. Therefore, we opt to regress our endogenous variable – the spatial lag – on the selected instrumental variables by using pooled OLS models (which are the first stage regressions). We then predict the values of the endogenous variable and regress our dependent variable – FDI policy liberalization measure – using zero-inflated negative binomial estimations (the second stage regressions). However, to check the validity of the instruments in the 2SLS–IV estimations, country fixed effects are employed.

As highlighted above, the validity of the selected instruments depends on two conditions. First is *instrument relevance*, i.e., they must be correlated with the explanatory variable in question. Bound, Jaeger and Baker (1995) suggest examining the F-statistic on the excluded instruments in the first stage regression. The selected instrument would be relevant when the first stage regression model's F-statistic is above 10 (Staiger and Stock 1997). Second, the selected instrumental variable should not vary systematically with the disturbance term in the second stage equation, i.e., $\left[\omega_{it} \mid IV_{it}\right] = 0$. Meaning, instruments cannot independently affect the dependent variable. As for the exclusion restriction, it is hard to believe that the exogenous variables of country *j* directly impact the liberalization of FDI policy in country *i*. Nevertheless, the F-statistic and Hansen J-test are employed (using 2SLS-IV) to check instrument relevance and exclusion criterion (results are provided at the end of all the tables reporting regression estimations).

4. Empirical Results

4.1 Baseline Results

Table 1 presents the baseline results, estimated using zero-inflated negative binomial regression estimations. Note that the Voung test results always support using zero-inflated negative binomial regressions over negative binomial estimations. Table 2 focuses exclusively on the sample of developing countries; table 3 captures the results of the sample of countries falling below and above the median value of the liberalization of FDI policy. Table 4 replicates our baseline results for both the full and developing countries sample with instrumental variable estimations. Note that the results in all tables report marginal effects at the mean of the explanatory variables[4]. A summary of the data statistics is presented in appendix 4. Beginning with column 1 of table 1, which includes only the spatial lag term, the result is positive and significantly different from zero, at the 1% level. This result remains consistent when we include a lagged dependent variable in column 2 of table 1. In column 3, which forms our preferred specification, we add the control variables. As can be seen, we find a positive spatial lag which is significantly different from zero, at the 1% level. Adding a lagged dependent variable in column 4 does not change the results of the spatial lag. To interpret the marginal effects, a single standard deviation increase in the liberalization of FDI policy in all other countries would increase the FDI policy liberalization measures in country i by roughly 0.21. These results therefore provide some preliminary evidence that countries do in fact compete for FDI via liberalization of FDI policy regimes after their competitors have done so.

4.2 Subsample Results

In table 2, we split the sample by excluding the developed countries[5]. Note that when doing this (as well as in all subsamples below in table 3), we recalculate the spatial lag using only those countries in the subsample, i.e., assigning those outside of the subsample a zero weight. This then assumes that the subsample of developing countries does not respond to

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[4] We use Stata 11.0's margins command to calculate marginal effects.
[5] These include: Australia, Austria, Belgium, Canada, France, Germany, Italy, Ireland, Spain, Portugal, Greece, New Zealand, United States of America, and United Kingdom.

changes in the FDI policies of developed countries. As seen in column 1, despite excluding the developed countries from the sample, the spatial lag term retains its positive sign and statistical significance, at the 1% level. These results remain consistent with the inclusion of lagged dependent variable in column 2 of table 2. The substantive effects suggest that a single standard deviation increase in the liberalization of FDI policy of all other developing countries would increase the FDI policy liberalization measures in a certain developing country i by roughly 0.13. What is interesting here, however, is the results reported in columns 3 and 4 where we test for competition across groups, i.e., between developing and developed countries. As seen, developing countries seem to only respond to changes in other developing countries, and not those taking place in developed countries. On the other hand, changes in FDI policy regimes in the developing world seem to have a strong positive influence on the FDI policy regime changes in the developing country in question, which is significantly different from zero, at the 1% level (see column 3). These results remain robust to the inclusion of a lagged dependent variable in column 4 of table 2. It is also interesting to note that developing countries are only competing among themselves and not with the developed world. This might well be due to the fact that developing countries are well aware that they do not possess factors such as an educated and skilled labor force, property rights protection, strong institutions, political stability, which would attract big ticket investment anyway, even without much competition.

The above results provide evidence of fierce competition between nations, both in the global sample as well as in the sample of developing countries. In table 3, we explore this further by separating our sample of countries into two categories: those for which the mean FDI policy liberalization measure over the sample period was below the median, and those for which the mean was above the median. We do this to investigate whether the extent of competition differs between developing nations which are relatively less open, and those

which are relatively more open to FDI. Note that as is the case in the sample of developing countries, we recalculate the spatial lags using within group countries only, implying that countries below the median do not respond to those above the median, and vice versa. As can be seen here, we find much stronger evidence of competition among countries which are relatively more open to FDI, where the marginal effects are somewhat greater than those in the full sample (see column 1 of table 3). This, combined with a higher number of changes to the FDI policy regime, suggests that a one standard deviation increase in changes in FDI policy in countries in the sample above the median, are associated with a change in policy of 0.43 in a given country i above the median. In contrast, we find the effects of the spatial lag in the sample below the median to be weak, which is statistically significant at the 10% level only (see column 2 of table 3). It is also noteworthy that the marginal effects of this subsample are smaller compared to any other subsample group and the global sample reported in table 1. In columns 3 and 4, we examine the cross-group competition between the two. Interestingly, we find that both these groups only compete among themselves and not with each other (see columns 3 and 4). Furthermore, the competition, as it appears from columns 3 and 4, is much fiercer among countries which are relatively more open to FDI. It is also noteworthy that if our results were simply capturing an overall trend in the liberalization of FDI policy, one would expect similar results for the above and below median groups because their trends are comparable. The fact that we find distinct results suggests that we are capturing something more than a mere trend in the dependent variable.

Before moving further, we focus on the extent of control variables in tables 1 to 3. As expected, the rate of growth in GDP is associated with a positive effect on the liberalization of FDI policy. On the contrary, however, we find a negative impact of GDP per capita (logged) on the liberalization of FDI policy. This is certainly a surprising result. A plausible explanation is that during our study period, high income countries had already liberalized

their FDI policy regimes, while developing countries were still in the process of doing so. In table 2, which is our sample of developing countries, we do not find any statistical significance for GDP per capita. In line with our expectation, we find that the extent to which a country is operating under an IMF program, the more likely it is to liberalize its FDI policy regime. In fact, these findings remain robust across all tables. Likewise, we also find the more democratic governments are associated with liberalizing FDI policy, a result consistent with the findings of Pandya (2010). The positive and significant effect of democracy on the liberalization of FDI policy is consistent across all tables. However, we do not find any support for the mere presence of a labor force and left leaning governments. These results mostly remain robust when estimating the models using IV estimations in table 4.

In table 4, we report the results based on zero-inflated negative binomial IV estimations. Note that columns 1 and 2 represent the global sample, while columns 3 and 4 represent the developing countries sample alone. Columns 1 and 3 capture the results of the first stage regressions estimated using the pooled OLS method, while columns 2 and 4 capture the second stage regressions using the zero-inflated negative binomial method. As seen from columns two and four, the positive significant effect of the spatial lag term remains robust in the IV models. Note that we have already included the lagged dependent variable in both these models and the spatial lag results still hold. The substantive effects for both the global and developing countries sample suggest that a one standard deviation increase in the spatial lag of the IV models is associated with an increase in the liberalization of FDI policy in country i by roughly 0.11. As highlighted earlier, to examine the validity of the instruments, we estimate 2SLS-IV models that report the statistics which explore the strength of the instruments. As can be seen here, the first-stage F-test and Anderson canon LR statistics report the test statistic used to test the null hypothesis, i.e., the parameter estimate for the instrument in the first stage regression is equal to zero. Based on Staiger and Stock

(1997), we treat F-statistics greater than 10 as being sufficiently strong. In table 4, we find that in all columns, the F-statistic is always greater than 10, which is significantly different from zero, at the 1% level.

4.3 Checks on Robustness

We examine the robustness of our main findings in the following ways. First, we use an alternative weighting approach where we weigh the FDI policy liberalization measure with the distance between each country, instead of GDP, under the presumption that a country closer to those countries with higher levels of liberalization in FDI policy are well placed to compete. We use the distance in kilometers from country i as the weighting scheme, so that more distant countries are given smaller weights. Hence, we use inverse distance, not

distance, with a weighting as follows: $\omega_{i,j,t} = \dfrac{\dfrac{1}{dist_{i,j,t}}}{\sum_{k \neq i} \dfrac{1}{dist_{i,k,t}}}$. The baseline results basically

remain unchanged, although the magnitude of the results does vary marginally. When weighted by distance, we still find that changes in FDI policy which are favorable to FDI in one country are positively correlated with the liberalization of FDI policy elsewhere. Likewise, we also replace GDP as a weight with GDP per capita. Here, the results of inter-country competition to attract FDI remain robust. Second, as an additional test for robustness we exclude the observations with extreme values. The main results still remain qualitatively unchanged, suggesting that the results are not driven by extreme values. Third, in a similar fashion, we also exclude a few countries which might be suspected of driving our results, such as Argentina, Brazil, China, India, Indonesia, Malaysia, Russia, South Korea, South Africa and Turkey, i.e., the emerging countries group. Estimating our baseline models without these countries generate very similar results with respect to the spatial lag, which remains positive and significant, at the 5% level. In summary, taken together, the results seem

to be very robust to sample size, specification, and testing procedure. The results of all of the robustness checks are not reported due to space considerations, but are available upon request. Given the robust evidence, we can safely accept the hypothesis of strong inter-country competition to attract FDI.

5. Conclusion

In this paper, we present the first set of empirical results exploring the possibility of competition between countries to attract FDI via the liberalization of FDI policy. Using spatial econometric estimations for a panel data of 148 countries over the 1992–2009 period, we find that favorable policy changes to the FDI regime in one country are positively correlated with changes to FDI policy in another. This does not imply that such competition is universal, however. We also find evidence that low income countries compete among themselves for investments through the liberalization of FDI policy, and that competition is at its fiercest among countries which are relatively more open to FDI. We interpret these results as direct evidence of inter-country strategic interactions in FDI policy. Our results also suggest several potential considerations for future policy and scope for further research. Given that changes in FDI policy which are favorable to FDI in one country are positively correlated with FDI policy in another, local governments should ensure that this competition is welfare enhancing, leading to a more equitable spatial distribution of investment in host countries. Secondly, it is important to recognise the fact that the ability of a country to attract FDI via liberalization of policy is contingent on other factors that attract investment, such as domestic market size, property rights, and institutional quality, among others. Thus, if a country attracts more FDI as a result of dramatic liberalization of its FDI policy, our estimates indicate that this would force others to respond by competing more fiercely in liberalizing their FDI policy regime to avoid losing potential investment. This suggests that it may be important to be mindful of the implications of such fierce competition, as it might

also result in race to the bottom. We leave this issue to future research, perhaps by usefully employing the comparative case study method to examine whether fierce competition among countries to attract FDI is leading to a race to the bottom, or otherwise.

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Table 1: Baseline results**:** Zero-Inflated Negative Binomial

Dependent variable: Count of FDI policy liberalization measures

Variables	(1)	(2)	(3)	(4)
Lagged Dependent Variable		0.022***		0.017***
		(3.46)		(3.06)
Spatial Lag	**0.150*****	**0.193*****	**0.127*****	**0.123*****
	(6.11)	**(5.98)**	**(5.06)**	**(4.87)**
Per capita GDP (log)			-0.234**	-0.225*
			(1.98)	(1.95)
GDP growth rate			0.006**	0.006**
			(2.19)	(2.10)
Labor Force (log)			0.116	0.121
			(0.64)	(0.67)
IMF program participation dummy			0.138***	0.139***
			(2.82)	(2.84)
Oil and Gas Exporting countries dummy			-0.211	-0.206
			(1.61)	(1.58)
Democracy dummy			0.175***	0.175***
			(2.81)	(2.83)
Left-wing Government dummy			0.002	0.002
			(0.03)	(0.05)
Time Trend	0.001	-0.003	0.006	0.006
	(0.46)	(0.90)	(1.08)	(0.96)
Country specific dummies	YES	YES	YES	YES
Vuong Test statistic	4.01***	4.32***	3.88***	3.88***
Number of Countries	147	147	145	145
Number of Observations	2498	2498	2464	2464

Notes: (a) Z-statistics in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

(b) Reports average marginal effects of all explanatory variables.

Table 2: Developing Countries sample**:** Zero-Inflated Negative Binomial

Dependent variable: Count of FDI policy liberalization measures

Variables	(1)	(2)	(3)	(4)
Lagged Dependent Variable		0.020***		0.020***
		(3.38)		(3.14)
Spatial Lag of Developing Countries	**0.069***	**0.063***	**0.062***	**0.023**
	(5.89)	**(5.56)**	**(5.20)**	**(2.10)**
Spatial Lag of Developed Countries			**0.015**	**0.061**
			(0.32)	**(1.32)**
Per capita GDP (log)	-0.160	-0.151	-0.161	-0.233*
	(1.30)	(1.25)	(1.30)	(1.91)
GDP growth rate	0.007**	0.006**	0.007**	0.009***
	(2.29)	(2.17)	(2.29)	(2.59)
Labor Force (log)	0.276	0.298	0.275	0.254
	(1.37)	(1.51)	(1.36)	(1.27)
IMF program participation dummy	0.140***	0.146***	0.140***	0.146***
	(2.82)	(2.87)	(2.81)	(2.86)
Oil and Gas Exporting countries dummy	-0.192	-0.194	-0.192	-0.221
	(1.43)	(1.43)	(1.43)	(1.58)
Democracy dummy	0.186***	0.188***	0.185***	0.197***
	(2.80)	(2.88)	(2.78)	(2.97)
Left-wing Government dummy	0.044	0.044	0.044	0.037
	(0.72)	(0.72)	(0.71)	(0.61)
Time Trend	0.001	-0.001	0.000	0.005
	(0.10)	(0.21)	(0.06)	(0.65)
Country specific dummies	YES	YES	YES	YES
Vuong Test statistic	4.08***	4.12***	4.08***	4.12***
Number of Countries	121	121	121	121
Number of Observations	2057	2057	2057	2057

Notes: (a) Z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

(b) Reports average marginal effects of all explanatory variables.

Table 3: Above and Below Median sample**:** Zero-Inflated Negative Binomial

Dependent variable: Count of FDI policy liberalization measures

Variables	(1)	(2)	(3)	(4)
Lagged Dependent Variable	0.032***	0.005	0.041***	0.011
	(2.58)	(0.27)	(3.11)	(0.31)
Spatial Lag of Above Median Countries	**0.193***		**0.183***	**0.019**
	(4.39)		**(4.39)**	**(0.67)**
Spatial Lag of Below Median Countries		**0.045***	**0.047**	**0.088****
		(1.62)	(0.58)	(2.15)
Per capita GDP (log)	-0.587*	-0.061	-0.644*	-0.063
	(1.65)	(0.85)	(1.88)	(0.68)
GDP growth rate	0.012	0.006**	0.012	0.007**
	(1.38)	(2.51)	(1.38)	(2.08)
Labor Force (log)	-0.261	0.150	-0.032	0.205
	(0.52)	(0.95)	(0.07)	(0.96)
IMF program participation dummy	0.293**	0.055*	0.256*	0.070*
	(2.11)	(1.69)	(1.90)	(1.79)
Oil and Gas Exporting countries dummy	-0.811**	0.156*	-0.827**	0.161*
	(2.35)	(1.96)	(2.41)	(1.66)
Democracy dummy	0.467***	0.021	2.140*	0.035
	(3.01)	(0.41)	(1.80)	(0.57)
Left-wing Government dummy	-0.034	0.027	-0.032	0.020
	(0.27)	(0.77)	(0.26)	(0.46)
Time Trend	0.007	0.004	0.013	-0.000
	(0.41)	(1.00)	(0.81)	(0.05)
Country specific dummies	YES	YES	YES	YES
Vuong Test statistic	3.82***	1.44*	3.65***	2.11*
Number of Countries	79	66	79	66
Number of Observations	1342	1122	1342	1122

Notes: (a) Z-statistics in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

(b) Reports average marginal effects of all explanatory variables.

Table 4: IV estimations

Variables	(1) Full sample POLS First stage	(2) Full sample ZINB Second stage	(3) Developing countries POLS First stage	(4) Developing countries ZINB Second stage
Lagged Dependent Variable		0.049		0.017***
		(1.00)		(3.07)
Spatial Lag		**0.159***		
		(4.49)		
Spatial Lag of Developing Countries				**0.060***
				(4.82)
Per capita GDP (log)	0.000525***	-0.313**	-0.0116***	-0.214*
	(7.78e-05)	(2.42)	(0.00119)	(1.79)
GDP growth rate	-0.510***	0.009***	-1.815***	0.008***
	(0.0244)	(2.68)	(0.188)	(2.79)
Labor Force (log)	-7.25e-05***	0.073	-5.68e-05	0.338
	(2.59e-05)	(0.34)	(4.87e-05)	(1.63)
IMF program participation dummy	-11.83***	0.153***	26.95***	0.144***
	(2.027)	(2.73)	(5.975)	(2.87)
Oil and Gas Exporting countries dummy	-72.56***	-0.250	196.0***	-0.206
	(10.16)	(1.63)	(12.97)	(1.53)
Democracy dummy	-10.13**	0.182**	52.31***	0.210***
	(4.119)	(2.53)	(10.48)	(3.19)
Left-wing Government dummy	-1.190***	-0.018	-10.37***	0.033
	(0.182)	(0.35)	(2.105)	(0.55)
Time Trend	0.0858	0.006	0.835***	-0.001
	(0.0885)	(0.95)	(0.109)	(0.18)
R-squared	0.697		0.653	
Country specific dummies	YES	YES	YES	YES
Vuong Test statistic		4.05***		4.36***
F- statistic		147.46***		210.82***
Number of Countries	145	145	121	121
Number of Observations	2608	2465	2177	2057

Notes: (a) Robust standard errors in parentheses in column 1 and 3 and Z-statistics in parentheses in column 2 and 4 *** $p<0.01$, ** $p<0.05$, * $p<0.1$

(b) Dependent variable in column 1 is the spatial lag for global sample.

(c) Dependent variable in column 3 is the spatial lag for developing countries sample.

(d) Dependent variable in column 2 and 4 is count of FDI policy liberalization measures.

(d) Column 1 and 2 reports coefficients and are estimated using Pooled OLS (POLS).

(e) Column 2 and 4 reports average marginal effects and are estimated using Zero-Inflated Negative Binomial (ZINB).
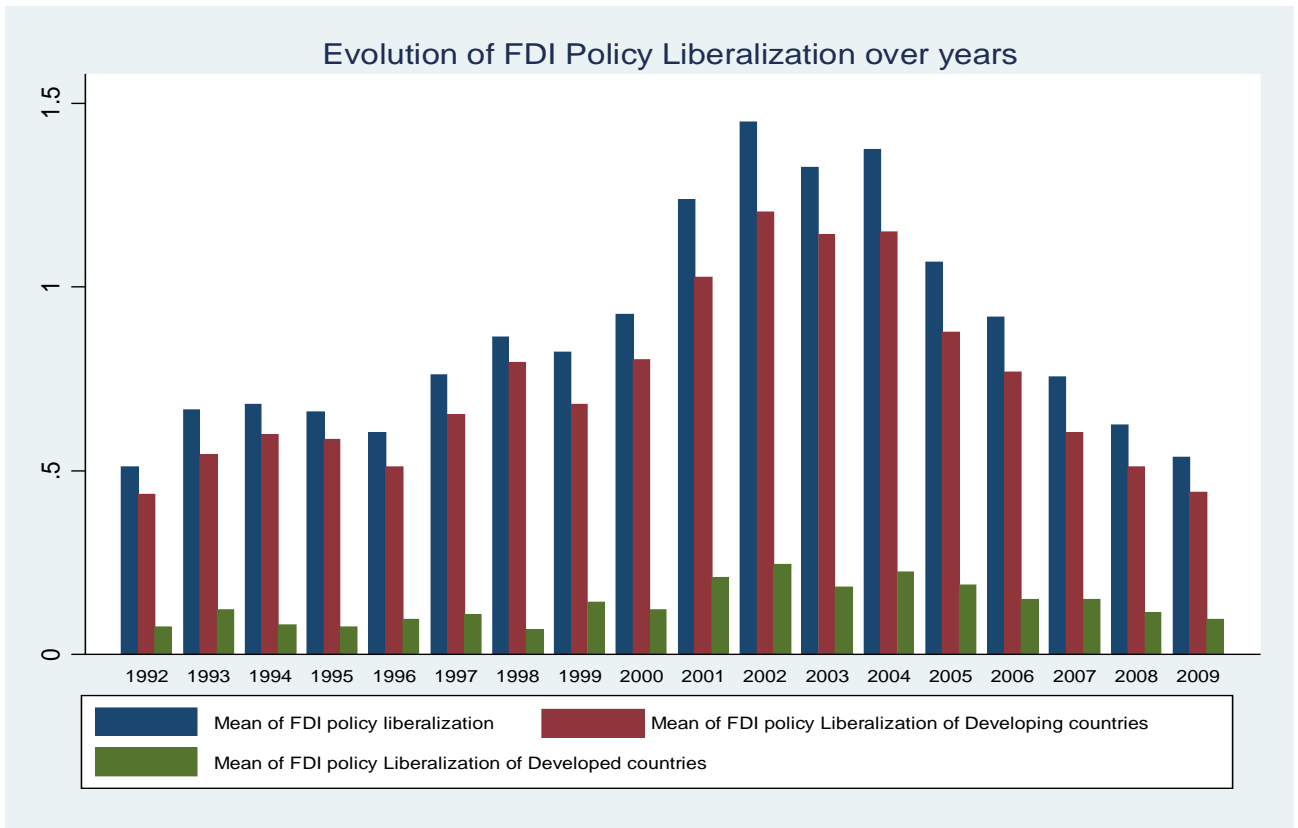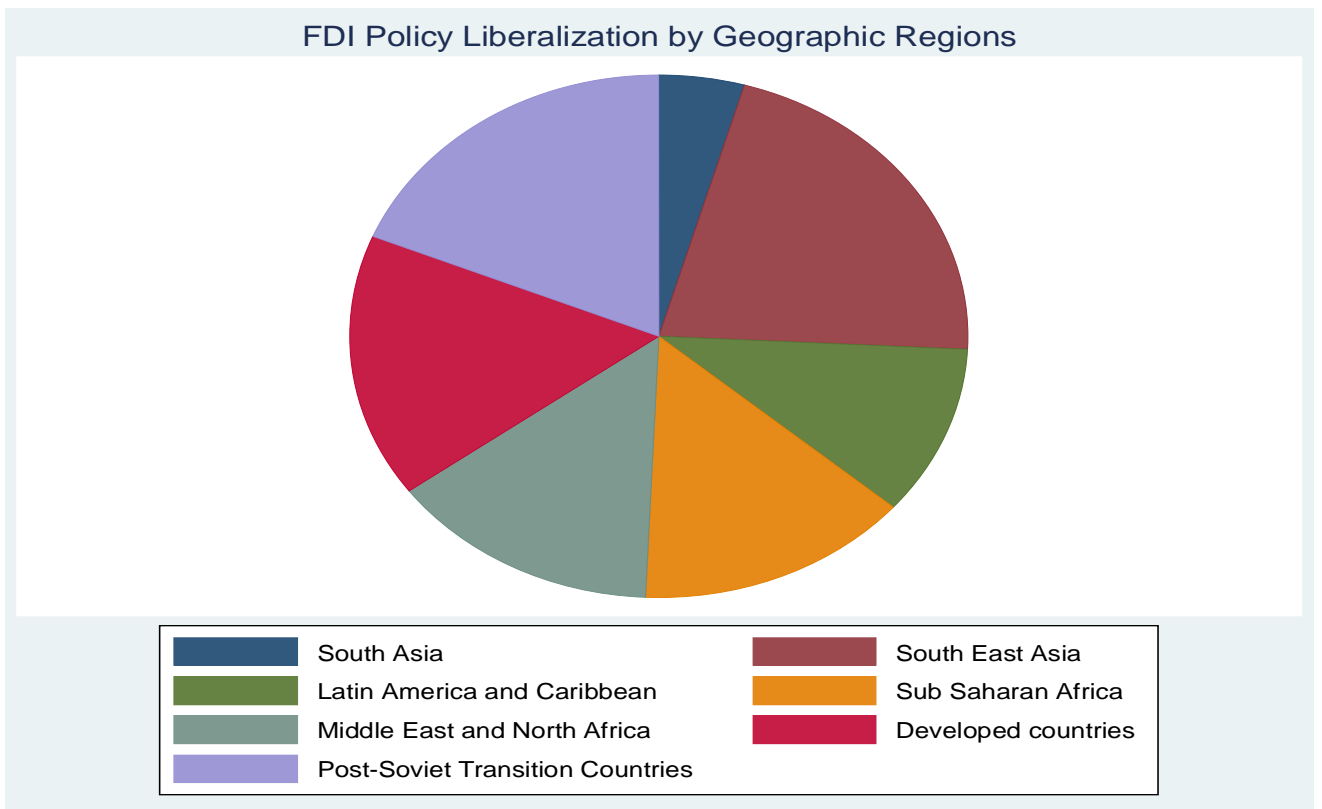
Figure 1

Evolution of FDI Policy Liberalization over years

Figure 2

FDI Policy Liberalization by Geographic Regions

Appendix

Appendix 1: Countries under study

Albania	Denmark	Kyrgyzstan	Qatar
Algeria	Djibouti	Lao People's Dem. Rep.	Romania
Angola	Dominican Republic	Latvia	Russian Federation
Argentina	Estonia	Lebanon	Rwanda
Armenia	Ethiopia	Liberia	Saudi Arabia
Australia	Fiji	Libyan Arab Jamahiriya	Senegal
Austria	Finland	Lithuania	Sierra Leone
Azerbaijan	France	Macedonia	Singapore
Bahrain	Gabon	Madagascar	Slovakia
Bangladesh	Gambia	Malawi	Slovenia
Barbados	Georgia	Malaysia	South Africa
Belarus	Germany	Mali	Spain
Belgium	Ghana	Mauritania	Sri Lanka
Benin	Greece	Mauritius	Sudan
Bolivia	Guatemala	Mexico	Sweden
Botswana	Guinea	Moldova	Switzerland
Brazil	Guyana	Mongolia	Syria
Brunei Darussalam	Honduras	Morocco	Taiwan
Bulgaria	Ecuador	Mozambique	Tajikistan
Burkina Faso	Egypt	Myanmar	Tanzania
Burundi	El Salvador	Namibia	Thailand
Cambodia	Equatorial Guinea	Nepal	Tunisia
Cameroon	Eritrea	Netherlands	Turkey
Canada	Hungary	New Zealand	Turkmenistan
Central African Republic	India	Nicaragua	Uganda
Chile	Indonesia	Niger	Ukraine
China	Iran	Nigeria	United Arab Emirates
Colombia	Ireland	Norway	United Kingdom
Comoros	Israel	Oman	United States
Congo Republic	Italy	Pakistan	Uruguay
Congo, Democratic Republic	Jamaica	Panama	Uzbekistan
Costa Rica	Japan	Papua New Guinea	Venezuela
Croatia	Jordan	Paraguay	Vietnam
Cuba	Kazakhstan	Peru	Yemen
Cyprus	Kenya	Philippines	Zambia
Czech Republic	Korea, Republic of	Poland	Zimbabwe
Côte d' Ivoire	Kuwait	Portugal	

Appendix 2: Categories under FDI policy Liberalization

FDI liberalization categories	Definition
Approval procedures	Relaxing, lifting, simplifying, and streamlining the procedure for approval of FDI into the host country.
Sectoral restrictions	Liberalizing the restrictions placed on foreign investors with respect to entry in different sectors namely, manufacturing, agro-based industries, natural resource sectors, and services (including market access restrictions).
Operational conditions	Deals with post-entry phase of investment. Includes: relaxing, lifting, removal of performance requirements by foreign investors; fair and equitable treatment of foreign investors, relaxing restrictions on the employment of foreign personnel; easing restrictions on imports of capital goods, spare parts and manufacturing inputs.
Incentives	Incentives provided to foreign investors include, fiscal incentives such as: reduction of taxes on income or profit and exemptions from payments of import duties on capital goods; financial incentives include: direct grants, subsidized credits and credit guarantees and government equity participation. Regulatory incentives comprise: relaxation of environmental, health, safety or social standards) and other non-financial incentives consists of subsidized services, the granting of market privileges through import protection or preferential government procurement contracts.
Investment guarantees	Guarantees provided by host country governments to foreign investors with respect to protection of intellectual property rights, laws, dispute settlement, ownership and other interests. It also includes providing clauses of guarantees to repatriate capital, dividends, profits and royalties
Foreign exchange	Relaxing various controls and laws over foreign exchange.
Corporate regulations	Liberalizing investment norms related to financial markets, stock exchange.

Source: http://www.sice.oas.org/Glossary/iteiit20042_e.pdf

Appendix 3: Data Sources

Variables	Definition	Data Sources
FDI policy Liberalization	Total Number of changes in FDI laws and regulations in eight categories namely, Foreign ownership, Approval procedures, Sectoral restrictions, Operational conditions, Incentives, Guarantees or protections, Foreign exchange, and Corporate regulations	UNCTAD 2011
Per capita GDP (log)	Per capita GDP (logged) in US$ 2000 constant prices.	Economic Research Service (ERS), Washington DC
GDP growth rate	Rate of growth of per capita GDP	Economic Research Service (ERS), Washington DC
Total Labor Force (log)	Total labor force active (logged)	UNCTAD 2011
IMF program participation	Dummy capturing whether a country was under IMF's Structural Adjustment Program or not	Dreher (2006)
Oil exporting countries	Dummy coded the value 1 if a country's oil exports are 1/3rd of their GDP and 0otherwise.	Fearon and Laitin (2003) augmented with fuel export data from the World Bank (2008).
Democracy	Dummy coded the value 1 if the Polity IV index is above +6 and 0 otherwise.	Marshall and Jaggers (2002) polity IV index
Left wing governments	Incumbent government's ideology takes the value 1 if the left leaning party is in government and 0 otherwise.	DPI (Database of Political Institutions dataset developed by Keefer 2001).

Appendix 4: Descriptive Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum	Observations
FDI policy Liberalization	0.877	1.738	0.000	41.000	2646
Spatial Lag	1.296	0.663	0.423	3.836	2498
Spatial Lag of Developing Countries	2.955	1.875	0.984	8.975	2498
Spatial Lag of Developed Countries	0.755	0.396	0.127	1.934	2498
Per capita GDP (log)	7.876	1.658	4.308	11.116	2645
GDP growth rate	3.800	6.601	-48.812	106.280	2646
Total Labor Force (log)	8.396	1.566	4.171	13.582	2645
IMF program participation dummy	0.118	0.322	0.000	1.000	2646
OIL exporting countries dummy	0.220	0.415	0.000	1.000	2646
Democracy dummy	0.457	0.498	0.000	1.000	2608
Left wing governments dummy	0.294	0.456	0.000	1.000	2645