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ABSTRACT

Foreign Direct Investment and Domestic Entrepreneurship: Blessing or Curse?[1]

This paper explores the effects of foreign direct investment, measured by mergers and acquisitions, on domestic entrepreneurial entry. We use a micro-panel of more than two thousand individuals disaggregated by industry in seventy countries including both developed and developing economies, 2000-2009. The theory yields ambiguous predictions about the relationship between FDI and entrepreneurship; positive spillovers via dissemination of technology or negative because of crowding out. Our empirical analysis is conducted at three levels of aggregation. We find the relationship between FDI and domestic entrepreneurship in aggregate and intra-industry to be negative. Policies need to consider how to counteract this effect.

JEL Classification: F23, M13, L26

Keywords: foreign direct investment, entrepreneurship, new firm entry, spillovers

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1. Introduction

Foreign direct investment (FDI) is an important element of international economics; the flow of capital, technology, knowledge and skills across national boundaries creates opportunities for host countries, particularly for developing countries to 'catch up' with others (Caves, 1996; Markusen and Venables, 1999; Javorcik, 2004). The literature linking FDI and economic development in the host economy mostly addresses spillover productivity effects via the dissemination of innovations on locally-owned firms (Barrios et al., 2005; Ayyagari and Kosova, 2010). Other avenues for positive spillovers include demonstration effects (Barry et al., 2003); labor mobility (Fosfuri et al., 2001) and enhanced export performance (Greenaway et al., 2004). Others cite potential advantages to the recipient country through contributions to restructuring of the economy (Caves, 1974; Kokko et al., 1996). However, some authors also draw attention to the potentially detrimental effect of FDI on development (Aitken and Harrison, 1999; Kathuria, 2000; Barrios et al., 2005). Negative spillovers can derive from for example reduced market competition through entry-deterrence in the style of Dixit (1980) or crowding out (Caves, 1996). Furthermore, the mechanisms of negative and positive effects depend on whether foreign and domestic firms are horizontally (intra-) or vertically (inter-) related to each other (Javorcik and Spatareanu, 2008) and whether competitors' products are strategic substitutes or strategic complements (Fudenberg and Tirole, 1984; Bulow et al., 1985).

New firm entry is an interesting lens through which to evaluate how spillovers from FDI affect the host economy because of the important role of domestic entrepreneurship in generating employment opportunities and innovation (Markusen and Venables, 1999) and in GDP growth (Baumol and Strom, 2007; Minniti and Levesque, 2010, Koellinger and Thurik, 2012). Levels of entrepreneurial activity also indicate the competitive pressures within the domestic economy, and its responsiveness to exogenous changes in technology and patterns of demand (Baumol, 1990). As such, they represent an important mechanism whereby the benefits of foreign investment in terms of technology, human capital and managerial skills might spill over from foreign-owned firms to the host economy (Acs et al., 2008). On the other hand, especially in a developing economy, foreign firms may be able and willing to pay higher wages to workers, enabling them to scoop up scarce domestic resources such as managerial talent and skilled labor; potential entrepreneurs might thus instead become tied up as employees of multinational firms. Other mechanisms for negative spillovers from FDI to domestic entrepreneurship include increased domestic market monopoly power leading to higher market entry barriers. Thus, the

theoretical arguments on each side of this debate are inconclusive which highlights the need to bring empirical evidence to bear, but this has been rare to date.

In this paper, we investigate the effects of FDI inflows measured by cross border merger and acquisition (M&A) on domestic entrepreneurship using an unbalanced micro-panel of more than two thousand individuals in each of seventy countries including both developed and developing economies. Empirical analysis is conducted at three levels of aggregation using both whole sample and disaggregated subsamples that are stratified by industry to focus attention on intra-industry (horizontal) spillover effects. Furthermore, our study takes into account the potential endogeneity of FDI inflows with respect to entrepreneurship. Our results indicate that the relationship between FDI inflows and entrepreneurship is in fact negative, indicating crowding out at both the aggregate and intra-industry levels. This result is found consistently across different specifications and using a variety of measures of entrepreneurial activity of which nascent entrepreneurship is our preferred one. The policy significance of our finding is indicated at the aggregate level, where we find that a 10 % increase in FDI inflows as a share of GDP causes nascent entrepreneurship to fall by 0.184 %. The results at the two industry levels of disaggregation are qualitatively similar though varying in size and significance.

This is the first study to assess the relationship between FDI and domestic entrepreneurship based on a panel of developed and developing countries over a ten-year span; most of the rather limited literature consists of individual country studies where the focus is generally on a particular industry (Görg and Strobl, 2002; De Backer and Sleuwaegen, 2003; Barrios et al., 2005). This paucity of empirical work is perhaps because identifying spillovers is inherently difficult: as Krugman (1991, p: 53) states “knowledge flows […] leave no paper trail by which they may be measured and tracked”, so spillovers are hard to quantify. Our work offers a way to overcome this limitation by using various measures of entrepreneurial entry subsequent to foreign direct investment via cross border M&A as the dependent variable, at the level of industry as well as in the aggregate. There is also a time dimension to our dependent variables which captures entrepreneurial activities at different phases of their life span.

The remainder of this paper is structured as follows. In the following section, we present the literature on the relationship between FDI and domestic entrepreneurship. We go on in the third section to discuss the data employed, which combines a new unbalanced cross country panel by industry about entrepreneurship derived from the Global Entrepreneurship Monitor with information at the industrial level about cross border M&A from Thomson. Much of the work in this study has been concerned with aligning the industry classifications of the two datasets and identifying appropriate instruments for

foreign direct investment in the entrepreneurship equations. These methodological issues are the subject of the fourth section (and the appendix) and results are reported in the fifth. Conclusions are drawn in the final section.

2. Foreign Direct Investment and Domestic Entrepreneurship

While much of the empirical literature on FDI spillover effects has argued that the impact on the host economy will be positive, (Javorcik, 2004; Blanchard et al., 2009), a few papers have suggested a negative effect (Aitken and Harrison, 1999). In this section, we summarize the main findings in both directions.

2.1. Positive Spillover Effects

The positive spillovers from FDI in the literature are usually argued to derive from the diffusion of technology and knowledge between foreign entrants and domestic incumbents. Foreign firms are assumed to own more advanced technology and to be able to motivate superior managerial performance compared to their local counterparts (Caves, 1996). Put differently, they possess firm-specific ownership advantages which involve companies' core competencies and differentiate them from competitors (Dunning, 1993). This is enabled foremost through high level of investment in innovative activities such as product, service and process developments (Guadalupe et al., 2012). In turn, exploiting the ownership advantages in resources and capacities combined with host country factors[2] is among the main motivations behind producing in a foreign market (Rugman, 1981). Once foreign firms have entered a domestic market, the diffusion of ideas and transfer of technology resulting from interaction with local economy is likely to occur both within and across industries (Javorcik, 2004; Haskel et al., 2007).

One of the channels through which knowledge diffusion is generated is demonstration effects, or contagion-imitation effects (Kokko, 1992; Barry et al., 2003). These are perhaps most likely to be observed horizontally, within an industry. Demonstration effects occur when for example local firms upgrade their technologies, develop new product and processes, or adopt similar organizational practices to those introduced by foreign companies. Interaction with foreign firms operating at higher

[2] For example, Grossman et al., (2006) describe the factors motivating FDI into host countries. They suggest that, even though locational drivers of FDI vary, the costs of factors of production, transportation and the availability of economies of scale are most important. Similarly, Ihrig (2005) argues that the level of technological differences between foreign and domestic firms plays a crucial role in the location of FDI. Results found in this study suggest that while horizontal FDI is attracted to countries with relatively better technology, vertical FDI goes hand in hand with low levels of technology available in the host countries. On the other hand, Alfaro and Charlton (2009) argue that due to limited data availability literature tends to systematically underestimate vertical FDI flows, and this type of foreign investment is often misclassified as horizontal FDI. Consequently, authors suggest that findings of studies distinguishing horizontal and vertical FDI need to be evaluated with care unless adequate attention is given to this separation.

levels of technology and imitation of their innovations may enable local firms to achieve higher productivity in their operations. Furthermore, as the novelties stemming from FDI presence are already tested in markets, domestic entrepreneurs may recognize their viability and convert them into profitable undertakings in a shorter time and with less risk of failure.

Labor mobility is another mechanism through which technology, skills and know-how may diffuse to local firms (Fosfuri et al., 2001). Training employees about company specific assets such as strategies, operations, processes make these competences better known within the organization. Being equipped with these new skills, the local workforce previously employed and trained by foreign-owned firms might take jobs in local enterprises or create businesses of their own.

Furthermore, export-oriented FDI can also provide local firms with the knowledge necessary to penetrate overseas markets (Greenway et al., 2004). Exposure to knowledge accumulated through foreign firms' international experiences can influence the export decisions of existing domestic firms (Aitken et al., 1997; Kneller and Pisu, 2007). It may further stimulate firm creation when export market opportunities are identified by local entrepreneurs, for example, by exploiting trade channels and reputation that have already been established by foreign enterprises.

These types of knowledge diffusions usually take place primarily within an industry; horizontally. The importance of inter-industry or vertical spillovers also has been considered in studies linking FDI and host economy development. In this regard, backward and forward linkages between vertically related industries are usually seen as the main mechanism for spillover effects (Rodriguez-Clare, 1996; Javorcik and Spatareanu, 2008). This type of *direct* knowledge transfer occurs once foreign firms develop supplier - customer linkages with their local counterparts. If foreign companies set higher product and service quality requirements, local suppliers may require and obtain technical assistance for improving their production processes, as well as their management and organizational skills.[3] Such enhancements may eventually increase productivity in local firms buying from or selling to the foreign investor (Javorcik, 2004). Moreover, being part of the multinationals supply chain may allow local suppliers to achieve economies of scale due for example to increased demand for intermediate goods and this may stimulate domestic entry into intermediate goods producing sectors (Markusen and Venables, 1999). Labor mobility between vertically related industries can also generate spillovers as employees trained by foreign firms may use their skills to improve local firms' performance; the impact on local industry may

[3] For example, Burstein and Monge-Naranjo (2009) draw a particular attention to management know-how embedded in foreign firms, and find that the relocation of management know-how to host (developing) countries accounts for sizeable increases in output and welfare levels.

also be visible when spin-offs are established through movement of labor across vertically related industries. However, the extent of all these vertical spillovers depends on how strongly foreign firms are integrated to local supply chains, and whether they use intermediate inputs produced locally (Caves, 1996). If foreign investors mainly source internationally, then ties with the host economy may be limited and the presence of knowledge spillovers will be less likely.

2.2. Negative Spillover Effects

FDI can also generate negative externalities for the host economy, through for example competition or 'market stealing' effects. The entry of foreign firm increases competitive pressures on domestic ones, which may drive less efficient local firms out of the market (Djankov and Hoekman, 2000). FDI-induced competitive forces may lead to a reduction in prices, ultimately resulting in displacement of local firms, which though inefficient in an international sense may provide local employment and income. The effect may be more severe if domestic firms are not efficient enough to compete with foreign firms for example due to a technological gap. In this case, the latter may come to dominate the host economy industry, and may attain monopolistic market power. Aitken and Harrison (1999) argue that the market stealing effect arises because foreign entry decreases productivity in domestic firms by forcing them to cut production. This negative effect is most prominent in the intra-industry context because foreign and domestic firms compete directly as suppliers to upstream foreign-owned entrants. The cost minimizing strategy of a foreign company may require international rather than local procurement of intermediate goods. As a result, if the foreign entry is by acquisition, existing local supplier links may be weakened over time, and ultimately replaced by international sourcing that meets global standards.

Another possible avenue through which a negative spillover might occur is related to factor markets. Foreign firms may change supply-demand balances in factor markets and exploit their global scale, resources and depth of pocket to attract the most productive host economy resources, notably labor. Foreign firms can exploit their domestic and international market power to offer better working conditions and higher wages in the host economy than domestic competitors, so talented workers may take positions in foreign firms instead of utilizing their skills in the development of domestic firms. In terms of the potential effects on entrepreneurship, FDI may restrict the formation of domestic firms by altering the relative payoffs to potential entrepreneurs in comparison with those for wage employment (De Backer and Sleuwaegen, 2003). Indeed, supporting this view, Hall and Woodward (2010) found that under certain conditions monetary reward to entrepreneurs is likely to be less than a risk free salaried job. Crowding out on these different domestic markets (product, labor, or supplier) is not necessarily

negative for economic welfare; FDI induced competition could increase domestic welfare by putting local assets to more efficient use. However, depending on the type and nature of FDI, the crowding out effect can also have adverse effects both across industries (Fudenberg and Tirole, 1984; Bulow et al., 1985) and within industries; for example, by increasing entry barriers (Dixit,1980). The direction of the impact depends on whether foreign entry is associated with increased market power in the relevant local markets.

2.3. FDI, Domestic Entrepreneurship and Spillovers

We focus on one particular facet of the relationship between foreign direct investment and the host economy, namely the impact of FDI on domestic entrepreneurship. The relationship between rates of entry of new firms and economic welfare is not unambiguous; since Chamberlain (1956), economists have been aware of the dangers of excessive entry as well as its opposite. However, a large literature attests to the important role of entrepreneurial entry in economic growth and job creation in both developing and developed economies (Schumpeter, 1934; Markusen and Venables, 1999; Acs and Audretsch, 2003; Baumol and Strom, 2007; Koellinger and Thurik, 2012). Rates of entrepreneurship usually go hand-in-hand with competition in the economy; and both of them contribute strongly to the level of innovation and technological progress that are vital to economic performance (Baumol, 1990). As a result, domestic entry may be seen as an important transmission channel to diffuse technology, human capital and managerial skills accompanying FDI into the host economy (Acs et al., 2008). For example, skilled workers, innovators and managers might receive their training and work experience within a foreign firm and then quit to create a new firm (Fosfuri et al., 2001). On the demand side, foreign firms might require higher quality or asset specific products which can be supplied by new entrants more effectively than existing firms.

On the other hand, foreign firms may exploit their superior market position in the domestic and global marketplace to crowd out domestic entrepreneurs. For example, if they pay higher wages to workers, they will influence the tradeoff between employment and self-employment in favor of the former. They may divert a significant amount of domestic factor endowments (e.g. finance, managerial and skilled labor) to themselves, raising the costs of entry for potential local entrepreneurs. Finally, if they act to increase domestic market power, this will result in higher entry barriers.

There has been less attention in the literature to the effects of this spillover mechanism on entrepreneurship than to studies of innovation or productivity. Theoretical models of spillovers are mainly in the occupational choice literature. Grossman (1984) argues that the impact of FDI on the host

economy is twofold: it lowers the number of domestic entrepreneurs and more importantly, it affects the distribution of individuals becoming an entrepreneur. The model suggests that higher earnings prospects in foreign firms attract potential entrepreneurs into waged employment rather than entrepreneurship. More recently, Das (2001) has investigated the responses of relative wages - the ratio of 'skilled' to 'unskilled wage'- to FDI inflows in a developing country context. The model suggests that if the technology gap between foreign firms and domestic ones is high and no convergence occurs, additional FDI inflows may crowd out locally-owned firms. The empirical literature comprises single industry and country studies and the results are contradictory. For example, De Backer and Sleuwaegen (2003) analyze firm entry and exit in Belgian manufacturing sector over 1990-1995. Their results suggest a crowding out of entrepreneurship from FDI, which occurs in both product and labor markets. In contrast, Görg and Strobl (2002) find that FDI presence has a positive effect on domestic entry in Irish manufacturing sector. Finally, Barrios et al. (2005) find a U-shaped relationship between FDI and local firms' entry by using plant-level Irish manufacturing data. Thus there are potentially two opposing effects of FDI on local entrepreneurship. Which effect dominates is an empirical question, which we attempt to answer in this paper.

3. Data

Our empirical work is based on the development and merger of two huge inter-industry cross country panel datasets, which covers up to 70 countries across ten years for several subgroups of industries at two different levels of industry aggregation. We combine information initially at the level of individuals from the Global Entrepreneurship Monitor (GEM) with data at the industrial level about FDI measured by cross-border M&A from Thomson. The GEM data have been collected as national surveys of individuals since 1999 and now cover more than seventy nations. GEM is based on representative national surveys of the adult population and the sample size is at least 2000 individuals per country. The survey samples are derived from the working-age population, so the database includes both entrepreneurs and non-entrepreneurs. The country selection has been growing since 2000, with an increasing emphasis on developing economies, so the panel element of the dataset is unbalanced. Information from the survey about in which sector and industry the individual is employed has been used to construct a variety of measures of entrepreneurial entry at two levels of industrial disaggregation. The second dataset provides information on FDI via M&A into each of the GEM countries for the relevant years, and is also

disaggregated to the same industrial classifications.[4] Much of the research in this project has involved constructing matching industrial level data of the two datasets.

Our measure of FDI is restricted in the sense that it considers only investment through M&A, and therefore does not take account of greenfield FDI. We will be careful in acknowledging this limitation in our interpretation of the results. In particular, FDI through M&A is perhaps more likely than FDI as a whole to have effects, whether positive or negative, on entrepreneurship because such investment projects ramp up to full size very quickly, while greenfield investments take longer to implement and to reach minimum efficient scale (UNCTAD, 2001). Hence the spillover effects from greenfield investments are likely to be slower in taking effect and initially smaller in impact than those from M&A.

We are also concerned that there might be some other factors we cannot control for and which may explain both entrepreneurship and FDI via M&A. To circumvent this problem, our FDI measure is instrumented by using two different variables that are discussed in detailed below. Furthermore, there is the possibility that the country-level FDI inflow may affect some of the country variables thereby giving rise to simultaneity bias. For this reason, we use a simple lag structure in our estimations. Finally, the issue of multicollinearity, mostly arising due to GDP per capita as a control variable, is addressed by converting this measure of economic development into a number of dummy variables. We return to these issues in the methodology section.

3.1. Dependent Variables

As we have noted, entrepreneurial activities are viewed as an important contributor to economic development (Koellinger and Thurik, 2012; Sobel, 2008), though the scarcity of comparable cross-country data on entrepreneurship has constituted a limitation in the literature (Carree and Thurik, 2003). The Global Entrepreneurship Monitor (GEM) Adult Population Survey project takes on this challenge by deriving an unbalanced panel of a variety of measures of entrepreneurship which are now being increasingly used in studies. Since the project was initiated in 1999 (Reynolds et al., 1999), GEM has evolved as a cross-national benchmarking tool with an aim to quantify entrepreneurial activities across countries and years (Reynolds et al., 2003).[5]

[4] In this paper, we consider three levels of aggregation for the data: the country level (whole sample) and two levels of industry breakdown. The most disaggregated groupings of industries include 11 1-digit ISIC rev.3 industries e.g. manufacturing. Secondly, at a higher level, we identify four broad 'industry clusters' which incorporate aggregates of these 1-digit industries on the basis of the similarities between them.

[5] There are gaps in the panel due to changes in the sample of countries that are included in each wave of the survey; the additions and eliminations lead to missing values appearing in the dataset. For example, Switzerland has GEM data corresponding to years 2002, 2003, 2005, 2007 and 2009.

One of the strengths of GEM is in its measures of entrepreneurial activity at the individual level. The survey identifies a variety of different measures of entrepreneurial activity of which we employ three in our analysis as the dependent variable. The definition of each variable is as follows (Reynolds et al., 2002; Reynolds et al., 2003):

Nascent entrepreneurship rate: The percentage of adult population (18-64 years old) who are currently active in establishing a business that they will own or co-own. This start-up has not yet generated positive cash flows for more than 3 months[6].

New business ownership rate: New business owners are former nascent entrepreneurs. The variable is defined as the percentage of the adult population who presently owns a firm and has done so for more than a period of 3 months but less than 42 months.

Total entrepreneurial activity rate (TEA)*:* The percentage of adult population who are either classified as nascent or new firm owner-managers[7].

3.2. Independent Variables

Foreign direct investment (FDI) is measured as annual cross-border M&A inflow at the target or host country level. [8] Motivations behind our choice of M&A deals as proxy for FDI inflows are as follows. First, detailed industry breakdowns of FDI inflows across countries and years cannot be obtained; an issue which is often identified in the literature (Shimizu et al., 2004). M&A deals provide a good alternative to eliminate this shortcoming as each individual M&A transaction in our data set comes with 6 digits NAICS codes. Second, M&A activities are the main stimulus behind FDI and cover around 80 % of FDI inflows (UNCTAD, 2007; Stiebale and Reize, 2011). Finally, cross-border M&A transactions have a more immediate impact on local entrepreneurship than greenfield projects. Greenfield requires more time and effort to be operational and to build up links into the local economy (UNCTAD, 2001).

[6] GEM survey employs, among others, the following questions to identify measures of entrepreneurship: (1) How many months have you been involved in starting this business? (2) Will you personally own all, part, or none of this business? (3) Has the new business paid any salaries, wages, or payments in kind, including your own, for more than three months? (4) What was the first year the founders of the business received wages, profits, or payments in kind from this business?

[7] In line with Wennekers et al. (2005) we focus mainly on nascent entrepreneurship. This is because we primarily focus on the relatively immediate influence of FDI inflows on entrepreneurship, though with a lag to address issues of causality. Nascent entrepreneurship is the dependent variable with cash flows of less than a year; the other GEM measures capture also survival rates of businesses as they cover a longer time horizon in their measurement. Nonetheless, results obtained from these alternative measures are also reported to indicate robustness.

[8] This paper uses FDI flow data instead of FDI stock. Conceptually, we are interested in the effects of FDI inflows on domestic entrepreneurship rather than the impacts of the accumulation of these flows.

M&A data are obtained from Thomson SDC Platinum database[9], which supplies authoritative coverage of worldwide M&A activities. We download all deals that comprise at least 10 % target ownership[10] for the foreign acquiring firm.[11] Altogether, we use 23126 M&A deal values to compute FDI inflows per country and year. We follow the usual practice as in Asiedu (2002), Kemeny (2010) and Aggarwal et al. (2011) and normalize the FDI variable with GDP[12] which is taken from World Development Indicators (WDI). M&A as well as GDP data is in current US dollars and cover the years through 1999-2008. Thomson provides industrial classifications for its M&A, and these are aligned with those within GEM.

Regarding the control variables in our analysis, a review of literature suggests a number of factors that have been seen in the literature as influencing national entrepreneurial activities. Most importantly, the development level of a national economy, institutional quality perhaps best indicated by business regulations and indicators of national culture are considered of high relevance (Acs et al., 2008; Van Stel et al., 2007; Wennekers et al., 2005; Hayton et al., 2002; Autio et al., 2013). Therefore, we chose the following control variables in the analysis. *GDP per capita* at purchasing power parity is extracted from WDI and it is in constant 2005 international dollars. We faced two difficulties associated with this as continuous variable. (1) It has a bimodal distribution, and (2) it is highly correlated with other independent variables in the estimated models.[13] Therefore, GDP per capita is converted into five dummies.[14] The literature suggests that of the many (highly correlated) institutional variables influencing entrepreneurial entry, the complexity of business regulation is perhaps the most important (Djankov et al, 2002). *Business regulations* are defined as total number of days[15] required to register a firm, derives from the World Bank's (WB) Doing Business division.

Variables capturing cultural characteristics are obtained from the World Values Surveys (WVS) which explores cross-national comparisons of culture, attitudes and beliefs[16] across the globe and the way they evolve over time. Enhancing our understanding of national value structures, the WVS project conducts a

[9] Thomson SDC Platinum database is extensively used in M&A research (see e.g. Deutsch et al. 2007; Finkelstein and Haleblian 2002).
[10] The 10 % threshold level is used and suggested by several international institutions such as OECD, IMF and UNCTAD.
[11] The individual transaction can be for less than 10 % of equity in the target firm, but if the acquiring firm accumulates at least 10 % ownership (including previous deals with the same target), the total deal value is included in the FDI inflow variable.
[12] We also tried gross fixed capital formation and market capitalization of listed companies to normalize FDI inflows. However, due to multicollinearity and implausible results, we opted to proceed with GDP instead of these two variables.
[13] Several alternatives such as log transformation, inclusion of a quadratic term are experimented with to eliminate these problems. Unfortunately none of them were effective.
[14] More information on this conversion can be found in methodology section.
[15] As an alternative to this variable cost comprising official fees and fees for legal and professional services as a percentage of GDP per capita is used from the same database. However, to avoid multicollinearity we decided not to use this cost variable.
[16] In fact coverage of WVS is much broader, the project provides a variety of measures in the areas of politics, diversity, religion, gender equality, environment, work, family etc.

series of surveys[17] in different countries since 1981 and currently covers more than 80 nations and a majority of world's population.[18] The surveys provide the most comprehensive work of its kind thereby largely used in studies linking values to various other factors; most notably economic outcomes (Inglehart and Baker, 2000; Berry et al.; 2010; Kwon and Arenius, 2010). In this regard, it is suggested that two key measures cover markedly different aspects of personal values in a given national culture (Inglehart and Welzel, 2005). These are: (1) *Traditional values vs. secular-rational approach*, (2) *survival vs. self-expression* respectively. The traditional dimension of the first measure involves values such as respect for authority, strong religious practices and family ties, and self-identification with national pride. At the other end of the same spectrum, we witness principles like open, collective decision making, a more global tendency and commitments towards relations outside the family circle. Concerning the dichotomy between survival and self-expression, the former is identified with food, housing, clothing etc., while the latter places emphasis on personal expression and self-development. Following the arguments raised by Inglehart (2006), and Hechavarria and Reynolds (2009), we include these two measures into the analysis to control for cultural factors that may potentially induce or inhibit entrepreneurship. Inglehart (2006) argues that countries whose citizens identify themselves with increasingly secular-rational values are more likely to seek to build a welfare state.

3.3. Instrumental Variables

FDI inflows and domestic entrepreneurship at the country or industrial level may both be explained by some other set of variables omitted from our analysis. We therefore instrument FDI by identifying factors that might influence foreign investors but are unlikely to impact upon potential entrepreneurs from the host economy. We focus on two such factors; distance between the source and host economy and corruption. The former seems especially likely to be a valid instrument since the effect of geographic distance on transactions costs of FDI is well established (Javorcik, 2004) but there is no mechanism for this to influence domestic entrepreneurship. The argument for corruption rests in the view that domestic players are acclimatized to the institutional arrangements of the host economy better than outsiders, and that perhaps the most significant indicator of institutional quality and the business environment from the perspective of foreign investors is the extent of local corruption (Mauro, 1995). The precise

[17] WVS project has already conducted five surveys in the years 1981, 1990, 1995, 2000 and 2006 and the sixth wave is currently in development. The data is publicly available via the project website. For each GEM country in the sample the average across all surveys was calculated.

[18] Nearly 85 %. Information retrieved on April, 18 2012 from http://www.worldvaluessurvey.org/wvs/articles/folder_published/article_base_46

instruments used for the estimation of FDI inflows are: (1) the weighted average geographic *distance*[19] between target country and its M&A source countries at a given year. The weight for a particular source country is computed based on its M&A share within overall inflows targeting a country-year combination. This is applied at aggregate and at the level of industry. (2) The *control of corruption* index from WB. It is defined as "perceptions of the extent to which public power is exercised for private gain".[20]

Good instruments must be uncorrelated with the error term of the original regression and good predictors of the variable being instrumented (Greene, 2011). There are no theoretical grounds to expect that domestic entrepreneurship levels will be responsive to varying degrees of bilateral distance. The distance variable is widely used in gravity models (Brainard, 1997; Carr et al., 2001; Bevan and Estrin, 2004) and is commonly used to predict FDI and trade flows between countries (Lee, 1993; Frankel and Romer, 1999). Therefore, our choice of bilateral distance as an instrument for FDI is well-grounded in the literature. Furthermore, corruption is a multidimensional phenomenon affecting different business practices with differing degrees of intensity. Husted (1999) indicates that national culture exerts strong influence on people's attitudes towards corruption. Studies linking cultural values with corruption mostly agree that corruption levels prevailing in different countries are in part explained by national culture (Rose-Ackerman, 1999; Davis and Ruhe, 2003). Therefore, one purpose of adding cultural variables as controls in our original regression is to capture the facet of corruption affecting *specifically* formation of domestic firms. On the other hand, the second instrument for FDI, control of corruption, is an *index* variable that is highly correlated some other macro variables such as rule of law, property rights. There is a considerable literature emphasizing the importance of such variables in attracting FDI inflows (Globerman and Shapiro, 2002; Pajunen, 2008) as well as cross-border M&A (Weitzel and Berns, 2006). As a result, our argument to use the control of corruption index as an instrument is to capture the overall investment climate in the host countries that influences foreign investors, rather than a particular level of corruption per se.

In order to get some more insights on data, a pairwise correlation matrix for the independent variables and corresponding summary statistics are presented Table 1 and Table 2.

[19] Bilateral distance data is obtained from Mayer and Zignago (2011). Distance here is calculated following the great circle formula, which uses latitudes and longitudes of the most important cities/agglomerations (in terms of population). There are alternatives present for this variable from the same source.

[20] Control of corruption index is available from the World Bank at http://info.worldbank.org/governance/wgi/sc_country.asp. While data are available on an annual basis since 2002, the index is computed only once every two years covering 1996, 1998 and 2000.

[INSERT TABLE 1 HERE]

[INSERT TABLE 2 HERE]

4. Estimation Methodology

Our base equation estimated at three levels of aggregation tests the relationship between domestic entrepreneurship, foreign direct investment and a variety of country and time specific control variables. The aggregate equations capture the sum of horizontal and vertical spillovers across the economy as a whole, while the intra-sectoral estimates refer to horizontal spillovers only. FDI inflows may be endogenous and hence correlated with the regression's error term. We therefore use two variations of 2SLS as our estimator (reporting also OLS to indicate the bias) and we cluster standard errors at the country level. The two 2SLS differ conditional on the instrumental variables used at the first stage. Furthermore, we lag all independent variables by one period to avoid potential simultaneity; as noted above a longer lag structure was too expensive in terms of degrees of freedom. We address potential problems of multicollinearity between GDP per capita and other independent variables by using a set of dummy variables in place of the former.[21]

If *i* denotes countries and *t* denotes time (years), our second stage model (equation 1) and corresponding first stage regression (equation 2) take the following form:

$$Entrepreneurship_{it} = \beta_0 + \beta_1 FDI_{it-1} + \beta_2 GDPper_{it-1} + \beta_3 Busi\_reg_{it-1} + \beta_4 Survival_{it-1} + \beta_5 Traditional_{it-1} + u \quad \textbf{(1)}$$

$$FDI_{it-1} = \alpha_0 + \alpha_1 Dista_{it-1} + \alpha_2 Contr\_Corrup_{it-1} + \alpha_3 GDPper_{it-1} + \alpha_4 Busi\_reg_{it-1} + \alpha_5 Survival_{it-1} + \alpha_6 Traditional_{it-1} + \varepsilon \quad \textbf{(2)}$$

Depending on the estimated model, $Entrepreneurship_{it}$ refers to one of the GEM measures of entrepreneurial activity discussed in the data section. The FDI_{it-1} variable is normalized with respect to the GDP level of the particular country. Five dummy variables are created to control for GDP per capita variable ($GDPper_{it-1}$). As a result, none of the pairwise correlations between the independent variables

[21] The chosen threshold levels are not theory-driven; rather we take a pragmatic approach which we believe to be the best available. The reference category dummy takes the value 1 if GDP per capita equals to 11 500 US $ or less. We chose the cutoff point such that the reference dummy is highly correlated with all other independent variables. This procedure ensures that the reference dummy absorbs much of the multicollinearity so that remaining dummies are less related to other independent variables. As the reference category dummy is excluded from the original regression, multicollinearity is not a serious an issue anymore.

and/or GDP per capita dummies exceeds 0.34. The variable $Busi\_reg_{it-1}$ reflects the total number of days required to register a firm; $Survival_{it-1}$ and $Traditional_{it-1}$refer to the cultural variables. The control of corruption index[22] ($Contr\_Corrup_{it-1}$) in the host country and bilateral weighted distance ($Dista_{it-1}$) serve as instruments to predict FDI inflows in the first stage regression along with other independent variables[23] from the original model. The variables FDI_{it-1} and $Dista_{it-1}$ are in logarithmic form because their distribution is non-normal.

We noted above that bilateral distance is theoretically exogenous to our original regression (equation 1) and the control of corruption index represents a set of related variables including rule of law and property rights, which we believe to be important in cross-border investment decisions, but less so in domestic entrepreneurship. The reliability of our instruments will be tested in the following ways. Where applicable, we will present test statistics such as the over identification test, the F-score of estimated models and partial R^2 of our first stage regressions (equation 2). For robustness, we estimate equations 2 with both instruments (distance and corruption), and with distance as the only instrument.

Our paper studies the effects of FDI on domestic entrepreneurship over time at country level and at country-industry level. Therefore, equation (1) is estimated separately at three layers of aggregation covering the whole sample and two industry breakdowns. At the first level of industry breakdown, the sample is allocated into four broad 'industry clusters', stemming from the GEM database. In the second disaggregation, we classify our data into 11 1-digit ISIC rev. 3 industries.

Entrepreneurship data used in this work is based on 4 digits ISIC rev. 3 industry classification whereas FDI data is available in 6 digits NAICS codes reflecting 2007 updates of the scheme. Therefore, we needed to map the data from NAICS 2007 to ISIC rev. 3. This necessitated some data adjustments prior to the data allocation across individual industries. Methodological details of the data mapping between ISIC rev. 3 and NAICS 2007 codes are included into the appendix. The appendix also includes tables showing the composition of our industry groupings.

[22] Due to data limitations, the missing values of this variable (corresponding to 1999 and 2001) are replaced with the average values of the neighboring years. A similar adjustment is made for the variable business registration as it only exists from 2004 to 2012.

[23] 2SLS estimation technique uses all explanatory variables from the original model to predict the instrumented variable (FDI in our case) in the first stage regression, based on the assumption that they are exogenous. One may argue that this procedure raises problems as our independent variables may be endogenous. However, given the fact that we lag all right hand side variables by one year, we ensure that the explanatory variables are only weakly endogenous, if at all. In fact, this view is corroborated by respective statistical tests reported in the results section.

Our sample covers the years from 2000 to 2009 but is unbalanced with a size of 347 observations. We have two cultural variables that are time-invariant and a business registration variable that does not change greatly over time. As a result, a fixed effects model appears to be less suitable as an estimation procedure.[24] The sample countries that are included in the analysis are listed in the appendix.

5. Results

We first report cross country results in the aggregate before continuing in the second sub-section to present our findings on horizontal spillovers based on the two levels of industrial disaggregation.

5.1. Cross-Country Analysis: Overall Spillovers

We have various dependent variables to capture different dynamics of entrepreneurship in the host economies. Equation (1) is therefore estimated separately for each measure of entrepreneurship using 2SLS techniques, and reported in comparison with OLS. The latter is estimated twice conditional on instrumental variables included in the first stage regression (equation 2). Given the number of models estimated, for brevity, we chose to report results in a parsimonious way in Tables 3-4.[25] Results obtained from OLS and two applications of 2SLS estimation using nascent entrepreneurship as dependent variable are presented in Table 3. Column (1) shows OLS results while columns (2) and (3) report 2SLS estimations. In column (2), weighted bilateral distance between target and acquirer countries is the only instrumental variable used to predict lagged FDI in the first stage regression. When the control of corruption index is included as an additional instrument to the first stage estimation, the relevant 2SLS results are shown in column (3). Table 3 reveals a small difference in lagged FDI coefficients between columns (2) and (3). However, when the OLS and 2SLS coefficients are compared, a much larger change, approximately 6-fold, is reported. This indicates that there may be a positive correlation between FDI and the error term in the OLS regression. Furthermore, as we discover later, the standard errors on the FDI variable in the 2SLS models are larger, however not as much as the coefficients themselves. This is not surprising, because standard errors in IV differ from OLS only in the R^2 of the first stage regression; and as the R^2 is less than 1, the IV standard errors are larger.

The aggregate results indicate that the relationship between lagged FDI and nascent entrepreneurship is negative, and this finding is consistent across all specifications in Table 3. Furthermore, the negative effect of the FDI variable is significant at the 1 % level in the 2SLS regressions and at the 10 % level in the

[24] In fact, the unbalanced nature of our panel resulting from the entrepreneurship measures and the lag structure of the estimation that costs many degrees of freedom, does not allow us to implement a fixed effects approach.
[25] Estimation results that are not reported are available in the web appendix.

OLS. Our results provide evidence that, at the cross-country level, negative spillovers stemming from previous year's FDI compensate for potential positive spillovers. Robustness checks with a two period lag also do not change our main results qualitatively.

We checked the endogeneity of the FDI variable by computing the difference between OLS and 2SLS estimators and obtained a test statistic with a p-value smaller than 0.001 for both models reported in columns (2) and (3) of Table 3. Here the null hypothesis is that the FDI variable is exogenous to the regression disturbance term. Table 3 also includes the partial R^2 between FDI and its fitted values in the first stage regression as a measure of instrument relevance. The value of this statistic equals 0.1881 and 0.2551 for the 2SLS models presented in columns in (2) and (3), respectively. Finally, we checked for overidentification by testing whether the instrumental variables are uncorrelated to the residuals, which is necessary to qualify them as valid instruments. As reported at the bottom of column (3), the p-value corresponding to the overidentification test is ≈ 0.9, indicating that the instruments satisfy this criterion.

We also explored whether the negative association between entrepreneurship and FDI is economically meaningful. [26] The OLS regression findings imply that a 10 % increase in FDI affects the nascent entrepreneurship rate in the host economy by -0.0314 %.[27] Likewise, results obtained from 2SLS models suggest a 0.1874 % and 0.1840 % decline in the level of entrepreneurship, respectively. To compute the coefficient on FDI as a share of GDP, we assume that the FDI measure increases by one standard deviation (that is 0.786). Holding all other explanatory variables in 2SLS models in columns (2) and (3) at their averages, this translates into a reduction of the nascent entrepreneurship rate by 0.015 % and 0.014 %, respectively.[28] Given a standard deviation of nascent entrepreneurship of 3.97, the magnitude of this decrease suggests that the negative economic effect of FDI is limited.

[INSERT TABLE 3 HERE]

We control for the level of economic development by including five dummy variables. The construction of indicator variables was necessary to address the variable's bimodal distribution and multicollinearity. As we move through columns (1)-(3) in Table 3, we find consistency in the results suggesting that higher levels of GDP per capita are negatively associated with nascent entrepreneurship. Furthermore, this negative link is statistically significant at the 1% level. This is consistent with the literature (Aidis et al.,

[26] Note that the FDI variable is subject to logarithmic transformation. The interpretation of relevant coefficients alters accordingly.

[27] In a level-log model $\Delta y = (\beta_1 / 100)\%\Delta x$ where y is the dependent and x is the independent variable.

[28] These values are calculated by multiplying the FDI variable coefficient with its standard deviation, that is 0.01874 x 0.786 = 0.015 for column (2) and 0.01840 x 0.786 = 0.014 for column (3).

2012). As a robustness check, the models in Table 3 are estimated with the logarithmic and quadratic forms of GDP per capita to capture potential non-linearities. We also altered the number of dummy variables and cutoff points for GDP per capita. The results obtained from these alternative specifications do not differ qualitatively from those reported in Table 3. Furthermore, we ran additional robustness checks by replicating the analysis in Table 3 with the subsamples of only OECD and non-OECD countries respectively. Again, we obtain similar results for both groups of countries. [29]

The control variable capturing the length of time required for business registration does not exhibit statistical significance in any model in Table 3, though as expected the sign of the coefficient is intuitive in columns (2) and (3). Regarding the two cultural variables, positive values on the traditional vs. secular-rational spectrum indicate more secular-rational orientation; whereas negative values indicate stronger ties with traditions. Similarly, positive values on the survival vs. self-expression range mirror priorities related to personal development, while negative values put more weight on the survival aspect. The results in Table 3 suggest that national emphasis on traditional and on self-expressive values are associated with greater nascent entrepreneurship activity. Both cultural variables are statistically significant at the 1 % level across all specifications.

In summary, as the test statistics in column (1) indicate, the lagged FDI variable is correlated with the error term, so OLS is not the optimal estimator to evaluate our predictions. Based on the estimation results and test statistics such as partial R^2 of the first stage regressions and the F test, the appropriate specification is the 2SLS model with two instrumental variables (column (3) in Table 3). For brevity, we do not report the estimation results obtained from OLS and 2SLS regressions where bilateral distance is the only instrument, because the results are qualitatively very similar to Table 3.[30] All estimation results presented hereafter refer to the 2SLS model with bilateral distance and corruption index as instruments for the FDI variable as our base specification.

[INSERT TABLE 4 HERE]

In Table 4, we provide results from our 2SLS base model using the alternative entrepreneurship measures discussed above as dependent variable. The coefficients on the lagged FDI variable presented in Table 4 have a similar pattern to that of Table 3 regarding the direction of relationship with entrepreneurship although coefficients vary quantitatively across columns (1) through (3). For all

[29] These additional estimations are available in the web appendix.
[30] The results are available in the web appendix

specifications, we find a negative and statistically significant effect of FDI inflow. When we compare the effect of FDI on nascent entrepreneurship (column 1) and on new business ownership (column 2), we see a decline in FDI's negative effect. This indicates that the younger is the start-up, the stronger are the negative spillover effects of FDI. In fact, while a 10 % increase in FDI in the previous year is associated with a 0.1840 % decline in nascent entrepreneurship, the decrease in new business ownership is 0.0847 %. (The corresponding value for total early stage entrepreneurship rate is 0.2580 %.)

Once again, it is interesting to analyze the economic importance of these point estimates. If we assume that the FDI variable increases by one standard deviation (that is 0.786), this will affect new and total early stage entrepreneurship activities by -0.007 % and -0.02 %, respectively. These numbers are relatively small in comparison to standard deviations of relevant entrepreneurship measures.[31]

Most control variables follow a similar pattern to those presented in Table 3. Therefore, we will not further elaborate on them.

5.2. Industry Level Analysis: Horizontal Spillovers

In this subsection, we assess how domestic entrepreneurship by country in different industries responds to lagged FDI into their country and sector. We use the same specification as in Table 4, though with variables within each country also disaggregated by sector; that is we use the 2SLS specification of Table 3 column 3 with bilateral distance and the corruption index as instruments for the industrial FDI variable (equation 1). Commencing with 'industry clusters'[32] we focus on whether horizontal FDI inflow into a given industry has an impact on domestic entrepreneurship in the same industry.[33] The 2SLS model is estimated for each industry and results are reported in Table 5. The dependent variable in these regressions is the host country's annual early stage entrepreneurship rate by industry.

[INSERT TABLE 5 HERE]

Table 5 reveals that the estimates at the industrial level on the lagged FDI variable are qualitatively comparable to those obtained using the full sample although the significance and the size of the effect vary. We find negative and significant relationships between entrepreneurship in an industry and FDI

[31] These are 3.18 and 6.12, respectively.
[32] See the tables presented in Appendix 3 for more detailed information regarding the composition of each industry cluster.
[33] There are also single-country studies focusing on the vertical effects of FDI. This type of analysis, however, requires detailed information on the inter-industry linkages, preferably over time, for each of the sample countries. Unfortunately, there is no such data available for all the countries in the sample. Therefore, this paper is particularly concerned with the effects of horizontal FDI inflows on domestic entrepreneurship.

into that industry in all specifications in Table 5 except for extractive industries, for which the relationship is of the same sign but insignificant.[34] Hence, speaking in Granger-causality terms, the results suggest that FDI has negative horizontal spillover effects on domestic entrepreneurship in most of the industries considered.

For transformative industries, column (1) shows that if horizontal FDI in the previous year increases by 10 %, the level of total early stage entrepreneurship in the following year drops by 0.0652 % and this impact is significant at the 1 % level. Similarly, the entrepreneurship rate decreases in consumer-oriented industries and business services by 0.1062 % and 0.0236 %, respectively, as horizontal FDI increases by 10 %. Although a statistically significant association is not detected for extractive industries, the direction of the effect is consistent with the other estimates.

If horizontal FDI in the transformative industries increases by one standard deviation (that is 0.843), the entrepreneurship rate in the same industries drops by 0.005. The corresponding effects on domestic entrepreneurship in consumer oriented industries and business services are -0.007 and -0.02, respectively. Given that average total early stage entrepreneurship rate across these three industry clusters is 2.06, the negative economic effect of horizontal FDI is, again, quite small. Table 5 also includes test statistics, such as overidentification, which are pertinent in the context of 2SLS applications.[35]

We also analyzed intra-industry (horizontal) effects of FDI on domestic entrepreneurship using more disaggregated data. Here, the four 'industry clusters' are disaggregated into 11 1-digit ISIC rev.3 industries.[36] We use the 2SLS base specification (Table 3, column 3) with bilateral distance and corruption index (equation 1) for estimations within each 1-digit industry, using nascent, new and total early stage entrepreneurship as dependent variables.

Though the models were estimated for each of 11 1-digit industries, some have very few observations which led to poor estimation results in the first-stage regressions. For example in agriculture, we only have an average of 2.4 M&A deals per country-year combination. We therefore only report the subset of 1-digit industry results that meet the criterion that the F-statistics of the estimated econometric model is statistically significant at the 5% level. The results on the intra-industry effects for these 1-digit industries

[34] The impact of the control variables is also in line with the analysis of the aggregate data.
[35] The R^2s of our models are relatively low for all estimations, but this is not surprising as the R^2 from 2SLS estimation "has no natural interpretation" (Wooldridge, 2006, p: 521).
[36] For more information regarding industry composition see Appendix 3.

that satisfy our econometric criterion are reported in Tables 6. Due to space constraints, we only present the coefficients of the lagged, second-stage FDI variable.

The results in Table 6 suggest that the intra-industry effect of lagged FDI on domestic entrepreneurship within 1-digit industries is negative and significant for two (one) industries out of the five for nascent (total early stage) entrepreneurship. Furthermore, as we see in panel A, this negative link is more pronounced in the manufacturing industry.

[INSERT TABLE 6 HERE]

6. Conclusion

In this paper, we investigated the effects of FDI via M&A on domestic entrepreneurship. The literature suggests that FDI could either stimulate or inhibit local entrepreneurship. While foreign enterprises bring knowledge and superior technology that can spillover into the local economy, they are also the source of increased competition in product and factor markets and may raise the opportunity cost of entrepreneurship compared to employment. The direction of the response of domestic entrepreneurship to FDI inflow relies on whichever of these two effects dominates.

Using data that covers both developed and developing countries over the period 2000-2009, we find FDI via M&A has a negative and significant effect on domestic entrepreneurship at the aggregate level. We further split our data into subsamples at two levels of disaggregation depending on industry type. Our industry level estimates are consistent with the aggregate results, namely, there is evidence of negative intra-industry effects of FDI on domestic entrepreneurship. These results are robust to alternative specifications of the dependent variable, as well as to different strategies for instrumenting FDI and for addressing potential endogeneity. This raises the question; how do we explain the negative impact of FDI on entrepreneurship?

The literature suggests that the competition effect is the principal source of crowding out in the intra-industry context. Foreign firms and domestic ones compete directly in product markets. If local enterprises fail to adopt superior technologies and to improve their productivity in response to the increased competition from the foreign entrant, they will be forced to exit. On the other hand, positive intra-industry spillovers from FDI may be limited because this type of knowledge diffusion, if it takes

place, would convey advantages to domestic competitors. Hence foreign firms have strong incentives to keep their technologies and management practices secret from domestic firms within the same industry.

The majority of FDI inflows in our dataset are heavily concentrated on the transformative (mainly manufacturing) and service industries, rather than the extractive industries. The negative effects of the FDI inflows on domestic entrepreneurship are also more pronounced in the former groups of industries. As a result, although we do not directly test the competition effects on domestic entrepreneurship, the results are suggestive of the fact that FDI-induced competition seems to dominate the benefits of knowledge diffusion particularly in transformative and service industries. On the other hand, when the competition between foreign firms and the local economy is limited, as in the extractive industries, the crowding out effects of FDI inflows are not significant.

An alternative explanation is related to the use of the local resources. Foreign firms enter a host economy so that they can benefit from assets peculiar to localities (Dunning, 1993). They can attract scarce domestic resources for example talented and skilled workforce. This translates into additional competitive pressure in labor markets, with the potential to change the entrepreneurial landscape in the local economy. A crucial driver behind new firm formation is the supply of entrepreneurially talented individuals. Equally important is the extent to which these prospective entrepreneurs have inclinations towards launching businesses of their own. This problem falls within the domain of an occupational choice model in which individuals have preferences for one of the alternative occupations and associated income flows; for example, the individual decides either to be an employee or become self-employed. This decision depends in part on the difference between expected income from wage employment and entrepreneurial pay. Given the wage structures offered by foreign companies are typically attractive by domestic standards, especially for skilled or managerial labor, potential entrepreneurs may take positions in these firms in preference to entrepreneurial activities. Related to this explanation, Grossman (1984) argues that FDI inflows not only lower the number of domestic entrepreneurs but also affect the distribution of individuals becoming entrepreneurs. Therefore, by attracting potential entrepreneurs into wage employment, it is plausible to expect that FDI presence exerts negative effects on domestic firm formation. Given the limitations of data in this study we can only propose rather than test these alternative explanations, but to do so remains an important subject for future research.

Like most studies in the field our analyses do not take into account the qualitative aspects of entrepreneurship. Entrepreneurship quality represents the extent to which new value is added to the economy in terms of for example job creation or technological innovation. High-growth firms and

business activities specifically in knowledge-intensive sectors are regarded as high quality entrepreneurship that contribute significantly to economic development. Due to data constraints, however, we are unable to capture the heterogeneous nature of entrepreneurship quality in this paper. Rather, GEM measures that we employ approach entrepreneurship from a quantitative perspective. This is to say that the negative effects of FDI simply reflect lower levels of entrepreneurship but this does not necessarily mean FDI also reduces the entrepreneurship quality. The presence of FDI might aid the birth of high-growth businesses which in turn might create positive welfare effects in the host countries. This is an empirical question which is beyond the scope of our analysis, and a subject of future study.

Our paper has policy implications as well. Many countries offer generous incentives to attract more FDI in the hope of knowledge spillovers. What our paper suggests is that while foreign firms may offer advantages for domestic firm development, policy circles should also consider the negative effects of FDI inflows on entrepreneurial activity. In practice our analysis shows that the economic impact on domestic entrepreneurship, while negative, is quantitatively quite small. Moreover, our findings refer only to FDI via M&A, which represents around 80% of foreign investment. Further work is needed to explore the impact of greenfield FDI. Even so, policy makers evaluating strategies to encourage foreign investors via M&A could consider acting simultaneously act to offset the relatively modest negative impact on domestic entrepreneurship by providing support for domestic entrepreneurs.

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Tables

Table 1: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FDI/GDP	1								
GDP per cap dum01	-0.223***	1							
GDP per cap dum02	-0.0871	-0.424***	1						
GDP per cap dum03	0.128**	-0.210***	-0.262***	1					
GDP per cap dum04	0.146***	-0.204***	-0.255***	-0.127**	1				
GDP per cap dum05	0.137**	-0.269***	-0.336***	-0.167***	-0.162***	1			
Business Registration	-0.210***	0.442***	0.0311	-0.111**	-0.211***	-0.278***	1		
Survival vs. Self-expression	0.343***	-0.414***	-0.229***	0.186***	0.342***	0.323***	-0.244***	1	
Traditional vs. Rational	0.118**	-0.534***	0.159***	0.279***	0.198***	0.0153	-0.308***	0.162***	1

N=347, * p<0.10, ** p<0.05, *** p<0.01

Table 2: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Nascent entrepreneurship rate	347	4.94	3.97	0.45	29.39
New business ownership rate	347	4.03	3.18	0.26	22.73
Total entrepreneurial activity rate	347	8.61	6.12	1.26	37.92
FDI/GDP	347	0.33	1.31	-5.57	3.18
Bilateral Distance	347	5.92	1.09	3.76	9.66
Control of Corruption Index	347	0.97	1.06	-1.32	2.59
GDP per cap dum01	347	0.25	0.44	0	1
GDP per cap dum02	347	0.35	0.48	0	1
GDP per cap dum03	347	0.12	0.32	0	1
GDP per cap dum04	347	0.11	0.31	0	1
GDP per cap dum05	347	0.18	0.38	0	1
Business Registration	347	29.21	31.34	2	152
Survival vs. Self-expression	347	0.38	0.84	-1.62	1.82
Traditional vs. Rational	347	0.06	0.92	-1.75	1.74

All independent variables are lagged by one year. FDI/GDP and bilateral distance are in log form

Table 3: Nascent Entrepreneurship Estimation Results at Aggregate Level

Estimation Method	OLS	2SLS	2SLS
	(1)	(2)	(3)
FDI/GDP	-0.314*	-1.874***	-1.840***
	(0.158)	(0.540)	(0.419)
GDP per cap dum02	-3.180***	-2.996***	-3.000***
	(0.873)	(0.833)	(0.840)
GDP per cap dum03	-3.883***	-3.251***	-3.264***
	(0.950)	(1.008)	(1.015)
GDP per cap dum04	-4.183***	-3.741***	-3.751***
	(1.003)	(1.046)	(1.058)
GDP per cap dum05	-3.722***	-3.377***	-3.384***
	(1.037)	(1.178)	(1.179)
Business Registration	0.00131	-0.00554	-0.00540
	(0.0181)	(0.0122)	(0.0122)
Survival vs. Self-expression	0.965***	1.611***	1.597***
	(0.314)	(0.501)	(0.492)
Traditional vs. Rational	-1.707***	-1.720***	-1.719***
	(0.309)	(0.367)	(0.364)
Constant	7.405***	7.626***	7.621***
	(0.926)	(0.836)	(0.816)
Partial R^2 of first stage regressions			
FDI/GDP	—	0.1881	0.2551
Test for exogeneity of FDI/GDP variable			
	—	13.219	24.267
		[0.0005]	[0.0000]
Test for overidentification			
Hansen J statistic	—	—	0.013
p-value			[0.9109]
Other statistics			
Observations	347	347	347
R^2	0.454	0.226	0.236
F	7.922	6.178	7.052

Notes: Dependent variable is nascent entrepreneurship rate. Estimation method is OLS in column (1), 2SLS for column (2) and column (3). In column (1), FDI/GDP variable is in its original values. In column (2) and (3), predicted values of FDI/GDP from first-stage regression are used. Bilateral distance is the only instrumental variable used to predict lagged FDI/GDP in the first stage regression in column (2). In column (3) we use both bilateral distance and corruption as instruments. Standard errors are reported in parentheses and corrected for clustering for countries. All independent variables are lagged by one year. FDI/GDP is in log form. P-values for the tests of exogeneity and overidentification appear in brackets. * p<0.10, ** p<0.05, *** p<0.01

Table 4: 2SLS Estimation Results for all Entrepreneurship Measures at Aggregate Level

Dependent variable	Nascent. Entre. (1)	New Entre. (2)	Total Early Stage Entre. (3)
FDI/GDP	-1.840***	-0.847**	-2.580***
	(0.419)	(0.352)	(0.631)
GDP per cap dum02	-3.000***	-3.291***	-5.918***
	(0.840)	(0.988)	(1.495)
GDP per cap dum03	-3.264***	-3.799***	-6.764***
	(1.015)	(1.129)	(1.761)
GDP per cap dum04	-3.751***	-3.819***	-7.186***
	(1.058)	(1.156)	(1.858)
GDP per cap dum05	-3.384***	-3.471***	-6.558***
	(1.179)	(1.075)	(1.892)
Business Registration	-0.00540	-0.00448	-0.00993
	(0.0122)	(0.00732)	(0.0120)
Survival v. Self- expression	1.597***	0.802**	2.247***
	(0.492)	(0.356)	(0.754)
Traditional vs. Rational	-1.719***	-0.786**	-2.388***
	(0.364)	(0.338)	(0.590)
Constant	7.621***	6.790***	13.81***
	(0.816)	(0.994)	(1.465)
Partial R^2 of first stage regressions			
FDI/GDP	0.2551	0.2551	0.2551
Test for exogeneity of FDI/GDP variable			
	24.267	7.275	23.225
	[0.0000]	[0.0088]	[0.0000]
Test for overidentification			
Hansen J statistic	0.013	0.031	0.000
p-value	[0.9109]	[0.8594]	[0.9855]
Other statistics			
Observations	347	347	347
R^2	0.236	0.298	0.322
F	7.052	7.109	9.487

Notes: Relevant dependent variable is at the top of each column. Estimation method is 2SLS. In all models, predicted values of FDI/GDP from first-stage regressions are used. We use both bilateral distance and corruption as instruments. Standard errors are reported in parentheses and corrected for clustering for countries. All independent variables are lagged by one year. FDI/GDP is in log form. P-values for the tests of exogeneity and overidentification appear in brackets. * p<0.10, ** p<0.05, *** p<0.01

Table 5: Industry Clusters Estimation Results: Intra-Industry Effects

Industry	Transformative	Consumer Oriented	Business Services	Extractive
	(1)	(2)	(3)	(4)
FDI/GDP_Horizontal	-0.652***	-1.062**	-0.236*	-0.0490
	(0.229)	(0.524)	(0.130)	(0.0563)
GDP per cap dum02	-1.112**	-4.005***	0.0369	-0.403***
	(0.450)	(1.104)	(0.210)	(0.152)
GDP per cap dum03	-1.430***	-4.686***	-0.158	-0.679***
	(0.547)	(1.147)	(0.332)	(0.211)
GDP per cap dum04	-1.661***	-4.412***	-0.267	-0.762***
	(0.543)	(1.260)	(0.403)	(0.244)
GDP per cap dum05	-1.775***	-4.717***	0.0205	-0.733***
	(0.564)	(1.317)	(0.334)	(0.227)
Business Registration	0.000660	-0.00788	-0.00493**	-0.00331**
	(0.00363)	(0.00802)	(0.00238)	(0.00162)
Survival vs. Self-expression	0.654***	0.783**	0.513***	0.208**
	(0.221)	(0.350)	(0.155)	(0.0913)
Traditional vs. Rational	-0.512***	-0.759***	-0.222**	-0.0418
	(0.185)	(0.257)	(0.0863)	(0.0589)
Constant	3.497***	4.227***	1.119***	0.889***
	(0.508)	(1.528)	(0.247)	(0.182)
Partial R^2 of first stage regressions				
FDI/GDP	0.1743	0.0683	0.1849	0.1075
Test for exogeneity of FDI/GDP variable				
	14.075	5.458	5.551	0.392
	[0.0004]	[0.0236]	[0.0219]	[0.5104]
Test for overidentification				
Hansen J statistic	0.095	1.147	0.788	0.732
p-value	[0.7574]	[0.2842]	[0.3748]	[0.3922]
Other statistics				
Observations	286	234	258	199
R^2	0.146	0.134	0.122	0.187
F	5.588	8.068	6.043	1.646

Notes: Dependent variable is total early stage entrepreneurship. Estimation method is 2SLS. In all models, predicted values of FDI/GDP_horizontal from first-stage regressions are used. We use both bilateral distance and corruption as instruments. Transformative FDI is normalized by total value added in mining, manufacturing, construction, electricity, water, and gas (ISIC rev.3 divisions 10-45). FDI labeled as consumer-oriented and business services are normalized by total value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services (ISIC rev.3 divisions 50-99). Value added in ISIC rev.3 divisions 1-5 covering forestry, hunting, and fishing, as well as cultivation of crops and livestock production is used to normalize extractive FDI. Standard errors are reported in parentheses and corrected for clustering for countries. All independent variables are lagged by one year P-values for the tests of exogeneity and overidentification appear in brackets * p<0.10, ** p<0.05, *** p<0.01

Table 6: 1-Digit Industry Estimation Results: Intra-Industry Effects

Dependent variable	Nascent Entre. (1)	New Entre. (2)	Total Early Stage Entre. (3)
PANEL A			
[a]Manufacturing_Horizontal	-0.269**	-0.0887	-0.342**
	(0.128)	(0.0600)	(0.161)
Observations	255	273	273
Hansen J statistic	0.271	0.015	0.233
p-value	[0.6024]	[0.9014]	[0.6296]
PANEL B			
[b]Finance-Insurance-Real Estate_Horizontal	0.0201	-0.0322	-0.0226
	(0.0188)	(0.0216)	-0.0226
Observations	231	249	249
Hansen J statistic	1.999	1.374	2.290
p-value	[0.1574]	[0.2412]	[0.1302]
PANEL C			
[c]Business Services_Horizontal	-0.0909	-0.128	-0.209
	(0.0677)	(0.0893)	(0.145)
Observations	203	221	221
Hansen J statistic	0.426	0.702	0.034
p-value	[0.5142]	[0.4021]	[0.8543]
PANEL D			
[d]Transportation-Communication-Utilities_Horizontal	-0.0456	-0.0380	-0.0788
	(0.0319)	(0.0257)	(0.0537)
Observations	233	250	250
Hansen J statistic	0.043	0.100	0.126
p-value	[0.8360]	[0.7515]	[0.7227]
PANEL E			
[e]Health-Education-Social Services _Horizontal	-0.0843**	-0.0907	-0.173
	(0.0387)	(0.0623)	(0.106)
Observations	106	116	116
Hansen J statistic	0.456	0.596	0.928
p-value	[0.4993]	[0.4401]	[0.3354]

Notes: Relevant dependent variable is at the top of each column. Estimation method is 2SLS. In all models, predicted values of FDI/GDP_Horizontal from first-stage regressions are used. We use both bilateral distance and corruption as instruments. Only coefficients and standard errors belonging to FDI/GDP_Horizontal variable are reported. [a] includes ISIC rev. 3 divisions 15-37, [b] covers ISIC rev. 3 divisions 65-67 and 70, [c] includes ISIC rev. 3 divisions 71-74, [d] covers ISIC rev. 3 divisions 40-41, 60-64 and 90, [e] covers ISIC rev. 3 divisions 75, 80 and 85. Standard errors are reported in parentheses and corrected for clustering for countries. P-values of overidentification appear in brackets * p<0.10, ** p<0.05, *** p<0.01

Appendix:

Appendix 1: Collinearity Diagnostics: Variance Inflation Factors (VIF)

Variable	VIF	1/VIF
FDI/GDP	1.16	0.865
GDP per cap dum02	1.74	0.575
GDP per cap dum03	1.64	0.608
GDP per cap dum04	1.90	0.526
GDP per cap dum05	1.92	0.521
Business Registration	1.28	0.780
Survival vs. Self-expression	1.74	0.573
Traditional vs. Rational	1.59	0.627
Mean VIF	1.62	

Appendix 2: Sample Countries

ALGERIA	EGYPT	KAZAKHSTAN	SAUDI ARABIA
ANGOLA	FINLAND	SOUTH KOREA	SINGAPORE
ARGENTINA	FRANCE	LATVIA	SLOVENIA
AUSTRALIA	GERMANY	LEBANON	SOUTH AFRICA
AUSTRIA	GREECE	MACEDONIA	SPAIN
BELGIUM	GUATEMALA	MALAYSIA	SWEDEN
BOLIVA	HONG KONG(SAR)	MEXICO	SWITZERLAND
BOSNIA & HERZEGOVINA	HUNGARY	MOROCCO	THAILAND
BRAZIL	ICELAND	NETHERLANDS	TUNISIA
CANADA	INDIA	NEW ZEALAND	TURKEY
CHILE	INDONESIA	NORWAY	UGANDA
CHINA	IRAN	PANAMA	UNITED ARAB EMIRATES
COLOMBIA	IRELAND	PERU	UNITED KINGDOM
CROATIA	ISRAEL	PHILIPPINES	UNITED STATES
CZECH REPUBLIC	ITALY	POLAND	URUGUAY
DENMARK	JAMAICA	PORTUGAL	VENEZUELA
DOMINICAN REPUBLIC	JAPAN	ROMANIA	
ECUADOR	JORDAN	RUSSIA	

Appendix 3: Mapping NAICS 2007 Industry Codes with ISIC rev. 3 Codes

Entrepreneurship data used in this work is based on 4 digits ISIC rev. 3 industry classification whereas FDI data is available in 6 digits NAICS codes reflecting 2007 updates[37] of the scheme. Therefore, some data adjustments needed to be made prior to industry level analysis. Namely, we translated all NAICS 2007 data into ISIC rev. 3 classification in order to ensure consistency between these two systems. One immediate problem we encountered is that, unfortunately, there is no readily available correspondence table between NAICs 2007 update and ISIC rev. 3 to ease data conversion. This is because, we believe, while the former classification is a quite recent one, the latter reflects even an older version of its kind. Therefore, concordance from NAICS to ISIC is done in three stages. First, entrepreneurship data is converted[38] from ISIC rev. 3 to ISIC rev. 3.1, and next M&A data corresponding to NAICS 2007 codes is transformed into 2002 updates of the same classification. At the final stage, M&A data NAICS 2002 codes is mapped into ISIC rev. 3.1 codes where correspondence tables are provided by the US Census Bureau.[39] One might argue that since NAICS is a newer economic activity classification, it would have been a better approach to convert ISIC codes rather than vice versa. Unfortunately, structure of entrepreneurship data allowed us to make limited adjustments which ultimately condition us to seek a practical solution of which we apply.

While mapping NAICS 2002 codes into ISIC rev. 3.1 ones, some of the former codes in our data had more than one correspondence within ISIC rev. 3.1 industry classification. These occurrences were rare; for example in year 1999 we have 3173 M&A deals in total and only 106 observations out of this map into multiple ISIC rev. 3.1 codes. Put it differently, only ≈ 3 % of all cases suffer from multiple mapping condition in 1999. The situation is also similar with regard to other years. As a result, for observations having this attribute, we proportionally allocated the value of an individual M&A deal into corresponding ISIC rev. 3.1 codes.[40]

[37] There is 2012 update in NAICS scheme as well but at the time that we obtained our M&A data (March, 2012) Thomson SDC platinum database was still using 2007 codes.

[38] Concordance table between ISIC rev. 3 and ISIC rev 3.1 is provided by United Nation Statics Division and is available from: http://unstats.un.org/unsd/cr/registry/regso.asp?Ci=23&Lg=1

[39] All used concordance tables are available at the website of the US Census Bureau: http://www.census.gov/eos/www/naics/concordances/concordances.html

[40] We also applied an alternative method of proportional allocation. When a single 6-digits NAICS 2002 code maps into more than one ISIC rev. 3.1 codes, we counted how many of these ISIC codes fall into the same industry. If total number of ISIC codes falling in the same industry has a clear majority over others, then this ISIC industry is used as the correspondence of that particular NAICs code. In the case of no clear majority in mapping, we read detailed industry descriptions to find the best fit between NAICS 2002 and ISIC rev. 3.1 codes. Furthermore, all industry level regressions reported in this paper also replicated after applying this mapping strategy. Indeed, results obtained from these alternative regressions are qualitatively the same to those reported in the paper (FDI variable coefficients are often larger than we currently reported)

After the adjustments mentioned above are done, firstly our data is allocated into four groups of industries in which we aim at as much homogeneity as possible within domain boundaries yet heterogeneity. As a further disintegration, we also classify our data into 11 1-digit ISIC rev. 3 industries. The compositions of each industry groupings at these two levels of disaggregation are presented in the following tables.

Industry Cluster	ISIC Section	ISIC 2-Digit Code	ISIC Rev.3 Title
EXTRACTIVE	A	01-02	-Agriculture, hunting and forestry
	B	05	-Fishing
	C	10-14	-Mining and quarrying
TRANSFORMATIVE	D	15-37	-Manufacturing
	E	40-41	-Electricity, gas and water supply
	F	45	-Construction
	G	50	-Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
		51	-Wholesale trade and commission trade, except of motor vehicles and motorcycles
	I	60-64	-Transport, storage and communications
	G	52	-Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods
CONSUMER-ORIENTED			
	H	55	-Hotels and restaurants
	L	75	-Public administration and defense; compulsory social security
	M	80	-Education
	N	85	-Health and social work
	O	90-93	-Other community, social and personal service activities
	P	95	-Private households with employed persons
BUSINESS SERVICES	J	65-67	-Financial intermediation
	K	70-74	-Real estate, renting and business activities

1-Digit ISIC rev.3 Industries	ISIC Section	ISIC 2-Digit Code	ISIC Rev.3 Title
	A	01-02	-Agriculture, hunting and forestry
AGRICULTURE-FISHING	B	05	-Fishing
	C	10-14	-Mining and quarrying
MINING-CONSTRUCTION	F	45	-Construction
MANUFACTURING	D	15-37	-Manufacturing
	E	40-41	-Electricity, gas and water supply
TRANSPORATATION-COMMUNICATION-UTILITIES	I	60-64	-Transport, storage and communications
	O	90	- Sewage and refuse disposal, sanitation, and similar activities
WHOLESALE	G	50	-Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
		51	-Wholesale trade and commission trade, except of motor vehicles and motorcycles
RETAIL	G	52	-Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods
HOTELS-RESTAURANTS	H	55	-Hotels and restaurants
FINANCE-INSURANCE-REAL ESTATE	J	65-67	-Financial intermediation
	K	70	-Real estate activities
BUSINESS SERVICES	K	71	-Renting of machinery and equipment without operator and of personal and household goods
		72	-Computer and related activities
		73	-Research and development
		74	-Other business activities
HEALTH-EDUCATION-SOCIAL SERVICES	L	75	-Public administration and defense; compulsory social security
	M	80	-Education
	N	85	-Health and social work
CONSUMER SERVICES	O	91	Activities of membership organizations n.e.c.
		92	Recreational, cultural and sporting activities
		93	Other service activities
	P	95	Private households with employed persons

Appendix 4: M&A Data Observation Summary over Sample Period

YEARS	Total # of M&A deals
1999	2298
2000	3004
2001	2496
2002	1745
2003	1674
2004	2043
2005	2570
2006	2337
2007	2611
2008	2348
Total	**23126**