

Foreign venture presence and domestic entrepreneurship: A macro level study

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Abstract:

Building upon the literature of necessity- and opportunity-driven entrepreneurship, this study explores how the presence of foreign ventures affect domestic entrepreneurship. We hypothesize that foreign ventures reduce necessity-driven entrepreneurship by diminishing unemployment in domestic economies, and stimulate opportunity-driven entrepreneurship by increasing knowledge stocks in domestic economies. Empirical results based on country-level longitudinal data of 30 countries from 1980 through 2008 support our hypotheses. We conclude that over time, domestic economies with more foreign ventures might have more opportunity-driven entrepreneurial activities and less necessity-driven entrepreneurial activities. Thus, foreign ventures can change the structure of domestic entrepreneurship in host countries.

Keywords: foreign venture | FDI | unemployment | knowledge spillover | entrepreneurship | macro

Article:

1. Introduction

The literature has long recognized the benefits of entrepreneurial activities on economic development (Acs, 2006, Carree et al., 2002, Wennekers et al., 2005). Recently, entrepreneurship scholars have started to explore macro-level factors that might affect entrepreneurial activities (Angulo-Guerrero et al., 2017; Thai and Turkina, 2014). Foreign ventures have received considerable attention, as their presence might enhance domestic firm productivity (Batten and Vo, 2009, Batten and Vo, 2015, Du and Rouse, 2018, González-Pernía and Peña-Legazkue, 2015, Hu and Jefferson, 2001, Javorcik, 2004), stimulate the mobility of human capital (Cheung and Lin, 2004, Fosfuri et al., 2001), facilitate knowledge spillover (Branstetter, 2001, Pathak et al., 2015), and reduce domestic unemployment (Braconier and Ekholm, 2000) in host countries.

Nonetheless, there exist two divergent lines of literature which can be used to explain how the presence of foreign ventures might affect domestic entrepreneurship. The first line claims foreign ventures might reduce domestic entrepreneurship by decreasing unemployment and thereby increasing the opportunity cost of becoming an entrepreneur (Amit et al., 1995, Cassar, 2006, Nikolaev et al., 2018, York and Venkataraman, 2010). The second line argues that the

presence of foreign ventures might add to the knowledge stocks in the domestic economy (Ghio et al., 2015), which is expected to increase the benefits of entrepreneurial activities by opening up more lucrative prospects for new venture creation (Acs et al., 2009, Fosfuri et al., 2001; Mrożewski and Kratzer; 2017).

While these two theoretical lenses yield contradictory predictions, we argue that together they can provide a more complete explanation of entrepreneurial activities in domestic economies. Thus, the purpose of this paper is to integrate these two lines of inquiry and explore how foreign ventures might affect domestic entrepreneurship. Instead of claiming that one line is more accurate than the other, we recognize that they represent two different motives behind domestic entrepreneurial activities that operate simultaneously. In particular, the first line symbolizes *necessity-driven* entrepreneurship, involving individuals who choose to start businesses because of limited alternative career choices (Block et al., 2015, Dencker et al., xxxx). The second line represents knowledge spillovers, which is more aligned with *opportunity-driven* entrepreneurship involving individuals who are able to leverage existing knowledge in order to discover and exploit lucrative prospects for new venture creation (Ardichvili et al., 2003, Acs et al., 2009, Mrożewski and Kratzer, 2017).

Building upon the literature of necessity- and opportunity-driven entrepreneurship, as well as the literature on foreign ventures and economic growth, we hypothesize that the presence of foreign ventures might affect domestic entrepreneurship through two mediators. The first mediator is unemployment. Here, we hypothesize that foreign ventures reduce domestic unemployment, which would otherwise “push” necessity-driven entrepreneurs to start a business (Block et al., 2015, Dencker et al., xxxx). The second mediator is knowledge stocks, which we hypothesize fosters opportunity-driven entrepreneurial activities (Acs et al., 2009, Agarwal et al., 2004, Agarwal et al., 2010, Audretsch and Keilbach, 2007, Ghio et al., 2015). We test our hypotheses on longitudinal data from 30 countries from 1980 through 2008. Consistent with our hypotheses, regression results show that the two mediators have countervailing effects on domestic entrepreneurship and that these effects differ in the short term and long term. Therefore, the effect of foreign ventures can be described as *structural*, where over time, necessity-driven entrepreneurship decreases while opportunity-driven entrepreneurship increases.

This article contributes to the entrepreneurship literature in several ways. First, we move toward a reconciliation of two conflicting theoretical lenses in terms of the effects of foreign ventures on domestic entrepreneurship. Such an endeavor highlights the fact that there exists a high level of variance among entrepreneurs’ motives (Shane et al., 2003), and the effects of foreign ventures on domestic entrepreneurial activities might not be homogenous. In addition, we find that the presence of foreign ventures appear to change the structure of domestic entrepreneurial activities in the long run, reducing necessity-driven entrepreneurship and increasing opportunity-driven entrepreneurship. Such a finding also contributes to the endogenous growth literature (Romer, 1994). Foreign ventures appear to be an important exogenous factor that fosters structural changes in domestic entrepreneurship. Finally, the comparison of short- and long-term effects in the mediation model highlights the importance of incorporating time into theorizing about entrepreneurship (e.g. Bird and West, 1998, York and Venkataraman, 2010).

In the following pages, we briefly review the literature on foreign ventures and domestic entrepreneurship as well as necessity-driven and opportunity-driven entrepreneurship. We then develop hypotheses, describe the methodology, present the empirical findings, and discuss the theoretical implications and limitations of our study.

2. Foreign ventures and domestic entrepreneurship

There are two separate lines of literature that are central to our research inquiry. To begin, the entrepreneurship literature suggests that the presence of foreign ventures might reduce domestic entrepreneurship by affecting the career choices of nascent entrepreneurs (Cassar, 2006, Zellweger et al., 2011). In fact, the literature notes that foreign ventures might affect the domestic labor market by either hiring more or stimulating domestic firms to hire more (Dachs and Peters, 2014). In either case, more foreign ventures might decrease domestic unemployment, which would reduce the need for individuals with few career choices to start a business (Storey, 1991). Hence, the presence of foreign ventures might be negatively related to domestic entrepreneurship (Shane and Venkataraman, 2000, Shane, 2003).

On the other hand, according to the knowledge-based literature, foreign ventures can also stimulate entrepreneurial activities via knowledge spillover, which increases knowledge stocks in the domestic economy (Bates, 1995, Ethier, 1982, Keller, 2002, Vo, 2016, York and Venkataraman, 2010). While knowledge spillover may occur when domestic firms import and/or export goods (Li and Park, 2016), the presence of foreign ventures in the domestic economy may be another source of knowledge spillover. In fact, selling goods to foreign-owned or joint ventures may provide learning opportunities with regard to product quality, market structures, and consumer preferences (Branstetter, 2001). Foreign ventures might also serve as incubators where nascent entrepreneurs can gain training and knowledge for subsequent venturing activities (Klepper and Sleeper, 2005, Yu et al., 2019).

While these two lines of literature seem to yield contradictory predictions, they can also be complementary. As we will discuss, foreign ventures can change the structure of entrepreneurship such that one type of entrepreneurship is reduced while the other is stimulated.

3. Necessity-driven and opportunity-driven entrepreneurship

As mentioned above, one possible explanation of the conflicting findings in the literature might be that studies tend to focus on only one type of entrepreneurial activity at a time even though the entrepreneurship literature has long recognized that not all entrepreneurs are the same (Shane et al., 2003). Thus, scholars differentiate two types of entrepreneurship: necessity-driven where individuals are *pushed* into entrepreneurial activities owing to limited career alternatives, and opportunity-driven where individuals are *pulled* into taking risks due to self-realization motives and perceptions of the existence of attractive entrepreneurial prospects (Block et al., 2015, Block and Sandner, 2009, Block and Wagner, 2010; Bosma and Harding, 2007).

The push of necessity-driven entrepreneurship is further articulated by Shapero, 1975, Shapero, 1984 who argued that life necessity might create a strong impulse for individuals to start their own businesses. Shapero claimed that “(m)ost entrepreneurs are displaced persons who have

been dislodged from some nice, familiar niche, and tilted off course” (1975, p252). In fact, on average almost 40% of early stage entrepreneurs in developed economies do not choose self-employment out of “improvement-driven opportunity recognition.” In developing economies, the percentage of necessity-driven entrepreneurship can exceed 50% (Poschke, 2013).

The dichotomy between necessity- and opportunity-driven entrepreneurship has received considerable attention in the entrepreneurship literature, covering topics such as entrepreneurial engagement (Grilo and Thurik, 2005), entrepreneurial profit (Block and Wagner, 2010), firm duration (Block and Sandner, 2009), knowledge spillover (Acs and Varga, 2005), economic development (Wennekers et al., 2005), and regional/national differences (Si and Bruton, 1999).

Note that necessity-driven entrepreneurship is often depicted as inferior compared to opportunity-driven entrepreneurship. For instance, it is found that necessity-driven entrepreneurs are less successful compared to opportunity-driven ones in terms of personal income, productivity (Amit and Muller, 1995), and profit (Block and Wagner, 2010). Acs and others also found that economies with more opportunity-driven entrepreneurs are better in technological innovation (Acs and Varga, 2005) and have higher household incomes (Acs, 2006). In addition, the literature indicates that necessity- and opportunity-driven entrepreneurs differ in their socio-economic characteristics; entrepreneurs with inferior economic and social status are more likely to be driven by life-necessity needs (Bergmann and Sternberg, 2007, Block and Sandner, 2009).

The literature also recognizes that environmental factors might affect the prevalence of necessity- and opportunity-driven entrepreneurship (Naudé, 2010). For instance, domestic unemployment has been highlighted as a major macro-level determinant of necessity-driven entrepreneurship. Thus, individuals without a job might perceive starting a business as a potential way to escape unemployment (Binder and Coad, 2013, Block and Wagner, 2010). In contrast, knowledge spillovers from incumbent firms or other sources may help nascent entrepreneurs identify and exploit emerging opportunities (Acs et al., 2009, Audretsch and Feldman, 1996, Kotha, 2010). Consequently, domestic economies with higher level of knowledge stocks may experience more opportunity-driven entrepreneurship (Agarwal et al., 2007, Agarwal et al., 2010, Agarwal et al., 2004).

Scholars often draw comparisons between necessity-driven and opportunity-driven entrepreneurship (e.g. Block and Sandner, 2009, Block and Wagner, 2010). However, if opportunity-driven entrepreneurship is indeed more valuable to the domestic economy than necessity-driven entrepreneurship, then a question of great practical relevance is what can we do to transform the structure of the domestic economy from one that promotes necessity-driven entrepreneurship to one that promotes opportunity-driven entrepreneurship? Most of the work that has been done focused on the endogenous growth model (Romer, 1994), where entrepreneurship is conceptualized as an *endogenous* factor which affects and is affected by economic development (Acs and Sanders, 2013, Braunerhjelm et al., 2010, Carree and Thurik, 2010, Wennekers and Thurik, 1999). Unfortunately, the impact of exogenous factors such as the entry of foreign ventures has received less attention, despite their relevance and ability to be influenced by public policy.

4. Hypothesis development

As we will further articulate, we theorize that foreign ventures might affect domestic entrepreneurship through two distinctive channels. The first one is aligned with the career choice theory of entrepreneurship while second one represents the knowledge spillover effect on knowledge stocks from the knowledge-based theory of entrepreneurship.

Regarding the theoretical model, there are two unique features. First, although both channels have domestic entrepreneurship as the dependent variable, they differ in their mediating variables. The channel mediated by unemployment represents the “push” effect aligned with *necessity-driven* entrepreneurship (Dencker et al., xxxx, Storey, 1991), while the one mediated by knowledge stocks represents the “pull” effect of *opportunity-driven* entrepreneurship (Acs et al., 2009, Agarwal et al., 2004, Agarwal et al., 2010, Audretsch and Keilbach, 2007). Second, the overall model can be described as “inconsistent mediation” (MacKinnon et al., 2007) in which unemployment is proposed to negatively mediate the effect of foreign ventures on domestic entrepreneurship, while knowledge stocks are proposed to positively mediate the effect of foreign ventures on domestic entrepreneurship. Inconsistent mediation highlights that mediating channels might be complex and might represent contradictory effects between an independent variable and a dependent variable (MacKinnon et al., 2007). As mentioned above, this feature might help reconcile the conflicting findings in the literature. We further develop our hypotheses in the following sections.

4.1. Foreign ventures and unemployment

When foreign ventures start to operate in a host economy, they need to recruit domestic labor in order to reap the benefits of cost reduction (Burda and Dluhosch, 2002, Hummels, 2007). In fact, the literature recognizes that employing domestic workers may greatly reduce operating costs (Burda and Dluhosch, 2002, Wei and Liu, 2006), while recruiting domestic sources for advertising, promotion, and customer service may reduce the cost of new market development (Agrawal, 1995, Ahn et al., 2019, Steger, 2002). In return, the domestic economy can benefit from a decline in unemployment (Fung et al., 1999). Note that the decline in unemployment is perceived to be more salient in the short-run, as foreign ventures’ hiring should take place as soon as they start to invest in domestic economy and that initial hiring is likely to be greater than incremental growth in jobs subsequent to entry.

In the long term, domestic firms start to capture new opportunities created by foreign ventures (Dachs and Peters, 2014). In fact, the presence of foreign ventures might increase market demand for inputs and intermediate products (Blalock and Simon, 2009), and domestic firms might choose to hire more in order to take advantage of increased demand (Fosfuri et al., 2001, Javorcik, 2004). In sum, we expect to see the presence of foreign ventures reduce domestic unemployment in both the short- and long- term. As such:

Hypothesis 1a. The presence of foreign ventures is negatively related to domestic unemployment in the short run.

Hypothesis 1b. The presence of foreign ventures is negatively related to domestic unemployment in the long run.

4.2. Foreign ventures and domestic knowledge stocks

In the knowledge-based literature, knowledge spillovers have received considerable attention (Branstetter, 2001, Keller, 2002). While knowledge spillovers may occur through trade with entities in foreign countries, the presence of foreign ventures in an economy may further increase such spillovers (Batten and Vo, 2009, Batten and Vo, 2015). Selling goods to foreign-owned or joint ventures in an economy may provide learning opportunities that can affect firm behavior and performance (Branstetter, 2001, Vo et al., 2017). Moreover, purchasing goods and services from incumbent foreign firms or joint ventures may provide opportunities to learn advanced technologies, which accelerate innovations (Coe and Helpman, 1995, Comin and Hobijn, 2010, Ernst and Kim, 2002, Li and Park, 2016, Manuelli and Seshadri, 2014).

Although *explicit* knowledge is likely to be transferred through international trade with entities in foreign countries, the acquisition of *implicit* knowledge is more difficult to pass across national boundaries (Audretsch and Feldman, 1996, Keller, 2002, Si and Bruton, 1999). Indeed, implicit knowledge, such as managerial experience and technological “know-how” have to be accumulated through “learning-by-doing” (Venkitachalam and Busch, 2012). Joint ventures and other partnerships with foreign ventures in a domestic setting may accelerate the diffusion of implicit knowledge (Ahn et al., 2019, Dai, 2019, Liu et al., 2010, Maung et al., 2019, Mudambi and Tallman, 2010, Si and Bruton, 1999). Thus, we expect the presence of foreign ventures to stimulate the development of both explicit and implicit knowledge stocks in domestic firms and subsequently in new firms.

Note that knowledge spillovers can come from foreign ventures from both developed and developing economies. This is because the implicit knowledge available from both kinds of foreign ventures, such as social networks or simply ways of doing business, can stimulate domestic entrepreneurship. Furthermore, foreign ventures coming from developing economies might have a higher stock of knowledge related to market competition, social networking, etc., reflecting the higher competitive barriers they have had to surmount to enter and succeed in global markets (Ahn et al., 2019).

However, we also expect that knowledge spillover is more likely to take place in the short- rather than long-run for two reasons. To begin, although knowledge spillover will occur continually over time, the greatest opportunity for knowledge spillover is around the time of initial entry of foreign ventures. For domestic firms, their motives are to absorb the knowledge as quickly as possible and use the absorbed knowledge in their own productive activities (Fang and Zou, 2010). In fact, as the absorptive capacity literature claims, in the long run, domestic firms might be driven to “de-bundle” the acquired knowledge, and “re-bundle” it with existing firm knowledge (Sirmon et al., 2007). In other words, in the long run, domestic firms are more likely to focus on assimilating and transforming acquired knowledge than acquiring new knowledge (Cohen and Levinthal, 1990). Furthermore, in the long run, foreign ventures are likely to improve their “isolation mechanisms” to limit the knowledge spillover effect in the domestic environment (Barney, 1991, Hoopes et al., 2003). Such isolation might be based on formal

mechanisms such as a patent protection or vertical integration, or informal mechanisms such as the development of complex social interactions (Campbell et al., 2012, Lengnick-Hall and Lengnick-Hall, 1988). Overall, we expect to see the positive effect of foreign ventures on domestic knowledge stocks to occur in the short-term rather than long-term.

Hypothesis 2a. The presence of foreign ventures is positively related to domestic knowledge stock in the short-term.

Hypothesis 2b. The presence of foreign ventures is not significantly related to domestic knowledge stocks in the long-term.

4.3. Unemployment and domestic entrepreneurship

In the entrepreneurship literature, it has been long recognized that the decision to start a business is determined by comparing costs (including the opportunity costs) and benefits; individuals prefer to exploit opportunities only when the perceived benefits exceed the perceived costs (Amit et al., 1995, Cassar, 2006, Hamilton and Harper, 1994, Shane, 2003). When a potential entrepreneur has no job, the opportunity cost (and hence the total cost) of starting a business is lower, giving them a stronger motivation to search for an alternative to wage-based employment to support themselves and their families (Carter, 2011). Thus, at the macro level, a higher level of unemployment can provide a “push” toward necessity-driven entrepreneurship and result in more entrepreneurial activities (Evans and Leighton, 1989, Evans and Leighton, 1990).

Note that such a “push” effect is more likely to take place in the short- rather than long-run. This is mainly because necessity-driven motives are urgent and need to be addressed in the short-term (Margolis, 2014). In other words, necessity-driven entrepreneurs might favor opportunities that can yield immediate returns rather than those that are time-consuming to exploit, albeit with the potential for higher profit (Gartner and Shane, 1995). That means the positive impact of unemployment on domestic entrepreneurship is more likely to occur in the short-term rather than long-term.

Hypothesis 3a. Domestic unemployment is positively related to domestic entrepreneurship in the short-term.

Hypothesis 3b. Domestic unemployment is not significantly related to domestic entrepreneurship in the long-term.

4.4. Knowledge stock and domestic entrepreneurship

Knowledge spillover generated by incumbent firms may stimulate domestic entrepreneurial activities (Agarwal et al., 2007). In fact, knowledge spillover theory indicates that working for and working with foreign ventures might equip individuals with *general* and *industry-specific* knowledge that can be valuable to future entrepreneurial activities (Klepper and Sleeper, 2005). *General business knowledge* encompasses a variety of basic business skills, such as planning, leading, selling, decision-making, negotiating, and others necessary for venturing success (Shane, 2003). Having work experience in a *specific industry* may also positively

contribute to venture creation in that industry (Shane, 2003). Studies show that both types of knowledge increase the likelihood that an individual will engage in entrepreneurial activities (Bates, 1995), and be more successful in those activities (Bates and Servon, 2000, Baum et al., 2001, Lee and Tsang, 2001, Shane et al., 2003). In addition, knowledge spillover might take the form of vicarious learning through observation (Denrell, 2003). Although foreign ventures have a comparatively larger stock of knowledge, it is not likely that they can fully exploit all the knowledge they possess (Agarwal et al., 2007). Through observation, potential entrepreneurs may identify opportunities those firms have been unable to exploit (Acs et al., 2009, Kotha, 2010).

Consistent with the literature, we argue that knowledge stocks are expected to positively contribute to entrepreneurial activities in an economy (Acs et al., 2009, Almeida and Kogut, 1999, Li et al., 2016). However, it is unlikely that positive externalities can take place immediately. To begin, although both general and specific knowledge as well as observation might motivate entrepreneurial activities, it takes time for opportunity-driven entrepreneurs to start a business (Folta et al., 2010, Raffiee and Feng, 2014).

More importantly, different from inter-organizational learning in which the organization already has a set of resources and knowledge, opportunity-driven entrepreneurs first need to acquire necessary knowledge, skills, and resources before absorbing and/or exploiting them (Cole et al., 2016, Kotha, 2010). In the short-run, this means that market competition driven by increased knowledge stocks might delay the exploitation of opportunities, leading to a *negative* relationship between knowledge stocks and domestic entrepreneurship (Jones and Wang, 2019). In contrast, opportunity-driven entrepreneurs are more likely to take advantage of knowledge stocks in the long-run (Gavious and Milo, 2019); hence the effect of knowledge stocks on domestic entrepreneurship is expected to turn *positive* in the long-run. Put formally:

Hypothesis 4a. Knowledge stocks are negatively related to domestic entrepreneurship in the short-term.

Hypothesis 4b. Knowledge stocks are positively related to domestic entrepreneurship in the long-term.

4.5. Inconsistent mediation and temporal dynamics

As shown in Fig. 1, we hypothesize that foreign ventures may influence domestic entrepreneurship in two ways. First, foreign ventures are expected to reduce unemployment, which in turn should reduce necessity-driven entrepreneurship. Second, foreign ventures are expected to increase domestic knowledge stocks, which in turn should stimulate opportunity-driven entrepreneurship. As we mentioned above, such a model is referred to as “inconsistent mediation” in which two mediators transmit contradictory effects from the independent variable, foreign ventures, to the dependent variable, domestic entrepreneurship (MacKinnon et al., 2007). Also note, as we highlighted in the hypotheses, temporal considerations add further complexity to the theoretical model.

Hypothesis 5a. Unemployment and knowledge stocks mediate the relationship between foreign ventures and domestic entrepreneurship in the short-term.

Hypothesis 5b. Unemployment and knowledge stocks mediate the relationship between foreign ventures and domestic entrepreneurship in the long-term.

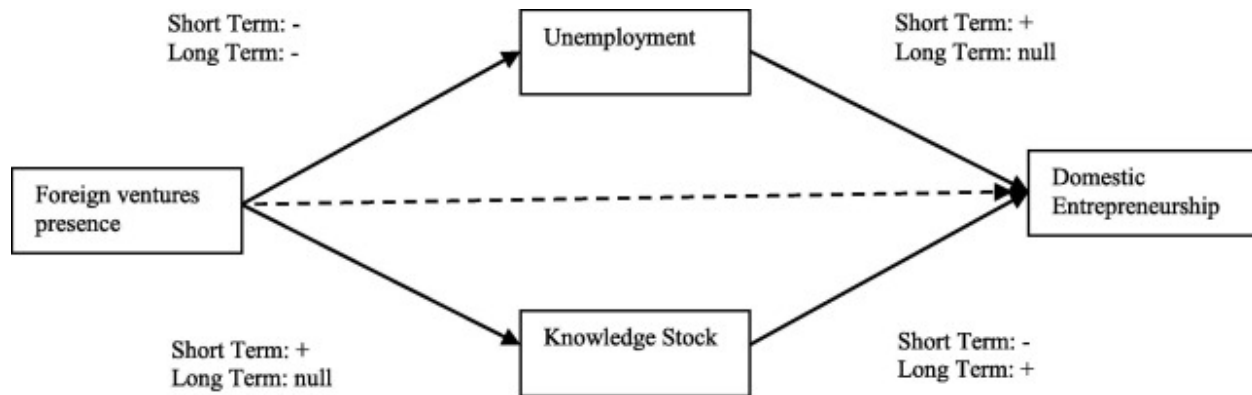


Fig. 1. Theoretical Model.

5. Methodology

Data were collected from two macro-level databases (see Table 1). Most of the variables (dependent, mediators, and controls) come from the Organization of Economic Cooperation and Development (OECD) database, except the independent variable, which comes from the United Nations Conference on Trade and Development (UNCTAD) database. The annual observations cover 30 countries from 1980 through 2008. Most of the observations are from developed economies. We incorporate data from some developing economies to increase the generalizability of the study. The structure of this database is unbalanced, suggesting that the sample size may vary in regression analyses. The longitudinal structure of the database ensures that we are able to test for both short- and long-term effects.

Note that the primary reason why we choose to use the 1980–2008 period is the 2008 financial crisis. Of particular relevance is the government intervention which were implemented after 2008 in order to mitigate the negative consequences of the crisis. Given such a severe crisis as well as various government responses toward the crisis, the structure of economic development at the country-level were completely altered. In another word, observations after 2008 might generate biased estimates, because the crisis might change the primary determinants of domestic entrepreneurship in each economy, also because economic activities such as domestic entrepreneurship might be excessively driven by government policies which largely vary from one to another. In addition, we have observed a collapse of world trade after the 2008 financial crisis. Again, there might be a country-specific effect, as some economies might react better and experience less declines in foreign investment compared to others. This means, the crisis not only affects our DV as mentioned above, it might also significantly affect the distribution of our IV (foreign venture presence). As a consequence, we did not include any observation after the year 2008.

Table 1. Definition of Variables and Data Source.

Name	Symbol	Definition	Unit	Source
<i>Domestic Entrepreneurship</i> (dependent variable)	ENTP	The percentage of the civilian labor force that is self-employed	Percentage	OECD Statistic
<i>Presence of Foreign ventures</i> (independent variable)	FDI	Inward FDI stock as a percentage of GDP	Percentage	UNCTAD (United Nations Conference on Trade and Development)
<i>Unemployment Rate</i> (mediator)	UNEMP	The percentage of the civilian labor that is unemployed	Percentage	OECD statistics
<i>Knowledge Stock</i> (mediator)	KSTOCK	Gross domestic expenditures on R&D as percentage of GDP. Each new year add its value to the existing stock. The depreciation rate is 10 percent every year.	Aggregated ratio	OECD statistics
<i>Capital Cost</i> (control)	CAPC	Three month interest rate of treasury bill as a percentage	Percentage	OECD Statistics
<i>Tax revenue on personal income</i> (control)	TAXIN	Tax revenue on personal income, as percentage of GDP	Percentage	OECD Statistics
<i>Tax revenue on corporate income</i> (control)	TAXCO	Tax revenue on corporate income, as percentage of GDP	Percentage	OECD Statistics
<i>Working-age population</i> (control)	WAPPL	The percentage of the total population between the ages of 15 and 64	Percentage	OECD statistics
<i>Income Growth</i> (control)	INCOMEGR	Annual percentage growth in disposal income per household	Percentage	OECD statistics
<i>Economic Growth</i> (control)	ECONGR	Five-year growth of gross domestic product (at price levels and PPPs of 1995), calculated by percent per year	Percentage	OECD statistics
<i>Patent</i> (control)	PATENT	Number of Triadic patent families submitted into either the European Patent Office (EPO), the United States Patent and Trademark Office (USPTO) or the Japan Patent Office (JPO). Measured as the log of the number per 10,000 inhabitants.	Natural logged	OECD statistics
<i>Fixed capital growth</i> (control)	FCAPGR	Annual percentage growth of gross fixed capital	Percentage	OECD statistics

Note: Observations contain Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States.

5.1. Dependent variable: domestic entrepreneurship

The dependent variable, domestic entrepreneurship (**ENTP**) is measured as the percentage of the civilian labor force that is self-employed. This measure has been widely used in studying entrepreneurship within countries and across countries (Acs et al., 2009, Bosma and Harding, 2007, Reynolds et al., 2005).

5.2. Independent variable: foreign venture presence

The independent variable, foreign venture presence or inward foreign direct investment (**FDI**), the investment made by firms from other countries in a focal country, as a percentage of Gross Domestic Product (GDP) is used to measure foreign venture presence (Cheung and Lin, 2004, De Clercq and Hessels, 2008, Hu and Jefferson, 2001).

5.3. Mediating variables: unemployment and knowledge stocks

The first mediator, unemployment (**UNEMP**) is measured as the percentage of the civilian labor force that is not employed.

Our measure of the second mediator, knowledge stocks (**KSTOCK**) follows Acs and colleagues (2009). We accumulate annual R&D expenditures in each country and depreciated the total from the previous year at a rate of 10% per year. This indicator is normalized by GDP, and measured as a percentage.

5.4. Control variables

Eight variables are used to control for factors that might influence the level of domestic entrepreneurship. Capital cost (**CAPC**) might influence domestic entrepreneurial activities as it represents the ease of obtaining financial capital. Following Shane (1996) and Acs and colleagues (2009), we measure capital cost by the three-month interest rate. Higher individual and corporate taxes (**TAXIN**, **TAXCO**) may make entrepreneurship less appealing (Henrekson, 2005, Shane, 2003). We measure these variables using individual taxes paid as percentage of GDP and corporate taxes paid as percentage of GDP. Previous studies assert that population structure may affect domestic entrepreneurial activities (Chrisman et al., 1992). We measure the working age population (**WAPPL**) as the percentage of the population that is of working age (16–65). Personal income is expected to influence the opportunity cost associated with venture creation (Amit et al., 1995). We control for individual income growth, measured as the percentage growth rate of household disposable income (**INCOMEGR**). Economic growth may affect domestic entrepreneurship (Bosma et al., 2007). We control for economic growth by using the five-year percentage growth of GDP with price levels and purchasing power parity (PPP) in 1995 as the base (**ECONGR**). Patents (**PATENT**) represent the knowledge created domestically rather than those diffused from foreign sources. The patent variable is measured as the log of the number of triadic patent families per 10,000 inhabitants submitted to European Patent Office (EPO), the United States Patent and Trademark Office (USPTO), or the Japan Patent Office (JPO). Finally, we control for fixed capital growth (**FCAPGR**), calculated as the percentage annual growth of gross fixed capital. This variable captures the growth of physical assets (Jaffe et al., 1993).

5.5. Models

To test the mediating effects hypothesized above, this study follows the four-step approach recommended by previous studies (Baron and Kenny, 1986, Judd and Kenny, 1981). Table 2 illustrates all models associated with the four steps. Step 1 tests the linkage between foreign

ventures and unemployment (H1a, H1b, Model 1), and foreign ventures and knowledge stocks (H2a, H2b, Model 2). Step 2 tests the connections between the mediators and the dependent variable. We test the connection between unemployment and entrepreneurship (H3a, H3b) and between knowledge stock and entrepreneurship (H4a, H4b) in Model 3.

Table 2. Model Specification.

Name	Model
Model 1	
Short-Term	$UNEMP_{t-1} = a_0 + a_1FDI_{t-2} + a_2CAPC_{t-2} + a_3TAXIN_{t-2} + a_4TAXCO_{t-2} + a_5WAPPL_{t-2} + a_6INCOMEGR_{t-2} + a_7ECONGR_{t-2} + a_8PATENT_{t-2} + a_9FCAPGO_{t-2} + e$
Long-Term	$UNEMP_{t-5} = a_0 + a_1FDI_{t-10} + a_2CAPC_{t-6} + a_3TAXIN_{t-6} + a_4TAXCO_{t-6} + a_5WAPPL_{t-6} + a_6INCOMEGR_{t-6} + a_7ECONGR_{t-6} + a_8PATENT_{t-6} + a_9FCAPGO_{t-6} + e$
Model 2	
Short-Term	$UNEMP = \beta_0 + \beta_1FDI_{t-n} + \beta_2CAPC + \beta_3TAXIN + \beta_4TAXCO + \beta_5WAPPL + \beta_6INCOMEGR + \beta_7ECONGR + \beta_8PATENT + \beta_9FIXCPGR + \varepsilon KSTOCK_{t-1} = a_0 + a_1FDI_{t-2} + a_2CAPC_{t-2} + a_3TAXIN_{t-2} + a_4TAXCO_{t-2} + a_5WAPPL_{t-2} + a_6INCOMEGR_{t-2} + a_7ECONGR_{t-2} + a_8PATENT_{t-2} + a_9FCAPGO_{t-2} + e$
Long-Term	$KSTOCK_{t-5} = a_0 + a_1FDI_{t-10} + a_2CAPC_{t-6} + a_3TAXIN_{t-6} + a_4TAXCO_{t-6} + a_5WAPPL_{t-6} + a_6INCOMEGR_{t-6} + a_7ECONGR_{t-6} + a_8PATENT_{t-6} + a_9FCAPGO_{t-6} + e$
Model 3	
Short-Term	$ENTR_t = a_0 + a_1UNEMP_{t-1} + a_2KSTOCK_{t-1} + a_3CAPC_{t-1} + a_4TAXIN_{t-1} + a_5TAXCO_{t-1} + a_6WAPPL_{t-1} + a_7INCOMEGR_{t-1} + a_8ECONGR_{t-1} + a_9PATENT_{t-1} + a_{10}FCAPGO_{t-1} + e$
Long-Term	$ENTR_t = a_0 + a_1UNEMP_{t-5} + a_2KSTOCK_{t-5} + a_3CAPC_{t-1} + a_4TAXIN_{t-1} + a_5TAXCO_{t-1} + a_6WAPPL_{t-1} + a_7INCOMEGR_{t-1} + a_8ECONGR_{t-1} + a_9PATENT_{t-1} + a_{10}FCAPGO_{t-1} + e$
Model 4	
Short-Term	$ENTR_t = a_0 + a_1FDI_{t-2} + a_2CAPC_{t-1} + a_3TAXIN_{t-1} + a_4TAXCO_{t-1} + a_5WAPPL_{t-1} + a_6INCOMEGR_{t-1} + a_7ECONGR_{t-1} + a_8PATENT_{t-1} + a_9FCAPGO_{t-1} + e$
Long-Term	$ENTR_t = a_0 + a_1FDI_{t-10} + a_2CAPC_{t-1} + a_3TAXIN_{t-1} + a_4TAXCO_{t-1} + a_5WAPPL_{t-1} + a_6INCOMEGR_{t-1} + a_7ECONGR_{t-1} + a_8PATENT_{t-1} + a_9FCAPGO_{t-1} + e$
Model 5	
Short-Term	$ENTR_t = a_0 + a_1UNEMP_{t-1} + a_2KSTOCK_{t-1} + a_3FDI_{t-2} + a_4CAPC_{t-1} + a_5TAXIN_{t-1} + a_6TAXCO_{t-1} + a_7WAPPL_{t-1} + a_8INCOMEGR_{t-1} + a_9ECONGR_{t-1} + a_{10}PATENT_{t-1} + a_{11}FCAPGO_{t-1} + e$
Long-Term	$ENTR_t = a_0 + a_1UNEMP_{t-5} + a_2KSTOCK_{t-5} + a_3FDI_{t-10} + a_4CAPC_{t-1} + a_5TAXIN_{t-1} + a_6TAXCO_{t-1} + a_7WAPPL_{t-1} + a_8INCOMEGR_{t-1} + a_9ECONGR_{t-1} + a_{10}PATENT_{t-1} + a_{11}FCAPGO_{t-1} + e$

Step 3 tests the direct effect of foreign ventures on domestic entrepreneurship (Model 4). Step 4 (H5a, H5b, Model 5) tests the extent to which the mediators capture the effects of these independent variable on the dependent variable (Baron and Kenny, 1986). If the mediating effect of unemployment exceeds the effect of knowledge stock, then foreign ventures may have an overall negative effect on domestic entrepreneurship. In contrast, if knowledge stocks have a stronger mediating effect than unemployment, the overall effect of foreign ventures may be positive. However, if the negative effect of unemployment just offsets the positive effect driven by knowledge spillover, little change in domestic entrepreneurship is likely to be observed.

5.6. Lags used for the analysis

We use different periodic lags in all models to test short-term and long-term effects. To capture short-term effects, we use a one-year lag between the mediators and the independent variable and a one-year lag between the dependent variable and the mediator. To capture long-term effects, we use a five-year lag between the mediators and the independent variable and a five-year lag

between the dependent variable and the mediator (see Table 2). Thus, the lag between the dependent variable and independent variables is 10 years. We also use one-year lags between the dependent variable and controls, and between the mediators and the controls, for all models to ensure the direction of causality.

6. Empirical findings

The correlation matrix for all variables is shown in Table 3. Because the database is longitudinal, we test if panel regression is necessary. Based on the BP-LM test ($\text{Chi}^2 = 1203.67$, $p\text{-value} = 0.000$, Model 5), panel regression is preferred. The Hausman test reveals that the fixed-effect panel regression is more appropriate ($\text{Chi}^2 = 27.68$, $p\text{-value} = 0.000$, Model 5).

Table 3. Descriptive Statistics and Correlation.

Name	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1, ENTP	18.75	11.33	1.00											
2, FDI	38.54	96.43	-0.20	1.00										
3, UNEMP	7.071	3.70	0.19	-0.16	1.00									
4, KSTOCK	7.33	4.67	-0.43	-0.06	-0.38	1.00								
5, CAPC	8.81	7.33	-0.12	0.00	-0.18	0.32	1.00							
6, TAXIN	9.76	4.85	-0.37	0.05	-0.18	0.32	0.14	1.00						
7, TAXCO	2.94	1.59	-0.13	0.04	-0.32	0.01	0.11	0.04	1.00					
8, WAPPL	66.26	2.72	0.40	0.03	0.16	-0.35	-0.20	-0.45	-0.14	1.00				
9, INCOMEGO	2.27	2.26	0.02	0.11	-0.05	0.10	0.12	-0.17	0.19	0.12	1.00			
10, ECONOGO	33.00	12.42	0.10	0.17	-0.01	-0.36	0.09	-0.24	0.41	0.23	0.49	1.00		
11, PATENT (log)	4.92	2.46	-0.28	-0.16	-0.35	0.77	0.03	0.20	-0.05	-0.28	-0.23	-0.40	1.00	
12, FCAPGO	-0.08	1.41	0.23	-0.00	-0.05	-0.31	-0.14	-0.47	0.06	0.56	0.22	0.31	-0.31	1.00

All correlations above $|0.11|$ are significant at 0.05 or better for a two-tailed test. All correlations above $|0.14|$ are significant at 0.01 or better for a two-tailed test.

6.1. Hypotheses tests

Table 4 provides the regression results for Models 1 and 2. It is found that foreign ventures have negative effects on domestic unemployment in both the short- ($\beta = -0.01$, $p\text{-value} < 0.001$) and long-term ($\beta = -0.01$, $p\text{-value} < 0.01$). Therefore H1a and H1b are supported. In addition, foreign ventures have a positive effect on domestic knowledge stocks in the short-term ($\beta = 0.01$, $p\text{-value} < 0.05$), but the effect is not significant in the long-term ($\beta = 0.01$, $p\text{-value} > 0.10$). Therefore, H2a and H2b are supported.

Table 5 shows the results of the tests of the impact of unemployment and knowledge stocks on domestic entrepreneurship as measured by self-employment. The results in the short-term indicate that unemployment has a positive impact on domestic entrepreneurship ($\beta = 0.13$, $p\text{-value} < 0.01$) and knowledge stocks have a negative impact ($\beta = -0.31$, $p\text{-value} < 0.001$). These results support H3a and H4a, respectively. The long-term results support H3b where unemployment is not significantly related to domestic entrepreneurship ($\beta = 0.05$, $p\text{-value} > 0.10$). The results also support H4b. Thus, knowledge stocks have a positive influence on domestic entrepreneurship in the long-term ($\beta = 0.25$, $p\text{-value} < 0.01$).

In Table 6 we report the impact of foreign ventures on domestic entrepreneurship.

Foreign ventures have a negative impact overall, although the relationship is not significant in the long-term analysis (short-term: $\beta = -0.01$, p-value < 0.01; long-term: $\beta = -0.02$, p-value > 0.10).

Table 4. Foreign Venture's Effects on Unemployment and Knowledge Stock.

Dependent Variables	Unemployment (Model 1)		Knowledge Stock (Model 2)	
	Short-Term	Long-Term	Short-Term	Long-Term
Intercept Term	14.23†	13.77†	14.95*	16.45*
Independent Variables				
Foreign Ventures	-0.01*** (H1a)	-0.01** (H1b)	0.01* (H2a)	0.01 (H2b)
Control variables				
Capital Cost	0.40***	0.42***	-0.23***	-0.23***
Tax: Personal	0.03	0.05	-0.16*	-0.16*
Tax: Corporate	-0.12	-0.13†	0.08†	0.08†
Working-age Population	0.07	0.07	-0.03	-0.05
Income Growth	-0.12***	-0.12***	0.05	0.04
Economic Growth	-0.08***	-0.08***	0.03*	0.03**
Patent	-0.30	-0.36	-0.03	-0.09
Fixed Capital Growth	-0.44***	-0.43***	-0.06	-0.07
Country Fixed Effects	Yes***	Yes***	Yes***	Yes***
Sample Size N	274	268	274	268
R² (Within R Square)	0.25	0.25	0.15	0.15
F-Statistics	73.61***	71.00***	196.66***	194.46***

*** Significant at 0.001 level; ** Significant at 0.01 level; * Significant at 0.05 level, † Significant at 0.10 level.

Table 5. Effects of Unemployment and Knowledge Stock on Domestic Entrepreneurship.

Dependent Variables	Domestic Entrepreneurship (Model 3)	
	Short-Term	Long-Term
Intercept Term	8.10†	8.26†
Independent Variables		
Unemployment	0.13** (H3a)	0.05 (H3b)
Knowledge Stock	-0.31*** (H4a)	0.25** (H4b)
Control Variables		
Capital Cost	0.14***	0.19***
Tax: Personal	-0.36***	-0.36***
Tax: Corporate	-0.11*	-0.11†
Working-age Population	0.26***	0.28***
Income Growth	0.03	0.01
Economic Growth	0.01	-0.02†
Patent	-0.82*	-0.82*
Fixed Capital Growth	-0.03	-0.07*
Country Fixed-Effects	Yes***	Yes***
Sample Size N	274	268
R² (Within R Square)	0.21	0.19
F-Statistics	667.80***	628.86***

*** Significant at 0.001 level; ** Significant at 0.01 level; * Significant at 0.05 level, † Significant at 0.10 level.

Table 6. Foreign Venture's Overall Effect on Domestic Entrepreneurship.

Dependent Variables	Domestic Entrepreneurship (Model 4)	
	Short-Term	Long-Term
Intercept	7.30	9.84
Independent Variable		
Foreign Ventures	-0.01**	-0.02
Control Variables		
Capital Cost	0.21***	0.23***
Tax: Personal	-0.31***	-0.32***
Tax: Corporate	-0.15*	-0.10†
Working-age Population	0.27**	0.22**
Income Growth	0.01	0.00
Economic Growth	-0.01	-0.02**
Patent	-0.84*	-0.83*
Fixed Capital Growth	-0.10**	-0.04
Country Fixed-Effects	Yes***	Yes***
Sample Size N	270	245
R² (Within R Square)	0.18	0.21
F-Statistics	643.93***	731.97***

*** Significant at 0.001 level; ** Significant at 0.01 level; * Significant at 0.05 level, † Significant at 0.10 level.
 Note: Short-term effect is controlled by using 2-year lag; long-term is by 10-year lag.

Table 7. Test of Full Mediation (Model 5).

Dependent Variables	Domestic Entrepreneurship	
	Short-Term Effects (H5a)	Long-Term Effects (H5b)
Intercept	9.50*	11.83†
Independent Variable		
Foreign Ventures	0.00	0.03
Mediators		
Unemployment	0.13**	0.01
Knowledge Stock	-0.30***	0.17***
Control Variables		
Capital Cost	0.13***	0.19***
Tax: Personal	-0.36***	-0.36***
Tax: Corporate	-0.12*	-0.08
Working-age Population	0.25**	0.21**
Income Growth	0.03	0.00
Economic Growth	0.01	-0.02**
Patent	-0.92***	-0.84*
Fixed Capital Growth	-0.03	-0.03
Country Fixed-Effects	Yes***	Yes***
Sample Size N	270	245
R² (Within R Square)	0.22	0.23
F-Statistics	679.91***	710.22***

*** Significant at 0.001 level; ** Significant at 0.01 level; * Significant at 0.05 level, † Significant at 0.10 level.

As we mentioned above, in the short-term, the presence of foreign ventures may reduce entrepreneurship if its negative effect on unemployment exceeds its positive effect on knowledge stocks, with the net result being fewer individuals who might otherwise engage in

entrepreneurship. In the long run, the lack of a significant effect of foreign ventures on domestic entrepreneurship is likely due to the combination of the positive effect of knowledge stocks and the negative effect of unemployment, which appear to be at least partial mediators of the relationship between foreign ventures and entrepreneurship.

Table 7 tests if the two mediators capture the primary channels through which foreign ventures affect domestic entrepreneurship. The coefficients of the two mediators are consistent with the estimated results in Model 3, suggesting that the regression results mentioned above are robust. Thus, unemployment is positively related to domestic entrepreneurship in the short-term ($\beta = 0.13$, p-value < 0.01) and not related to domestic entrepreneurship in the long-term ($\beta = 0.01$, p-value > 0.10). In addition, knowledge stocks are negatively related to domestic entrepreneurship in the short-term ($\beta = -0.30$, p-value < 0.01) and positively related to domestic entrepreneurship in the long-term ($\beta = 0.17$, p-value < 0.001). The estimated coefficient for the foreign venture variable is not significant for either the short- or long-term analyses.

Since the results of the four step analysis are consistent with the proposed mediating effects of unemployment and knowledge stocks on the relationship between foreign ventures and domestic entrepreneurship in the short-term, we find support for H5a.

However, the analysis was not able to conclusively establish that unemployment and knowledge stocks have a mediating effect on the relationship between foreign ventures and domestic entrepreneurship in the long-term. Thus, H5b is not supported. First, although foreign ventures reduce unemployment in both the short- and long-term, neither the foreign ventures nor the unemployment variables seem to influence domestic entrepreneurship in the long-term. Second, while foreign ventures seem have a positive impact on knowledge stocks in the short-term, they have no long-term impact on either knowledge stocks or domestic entrepreneurship. This suggests that after their initial entry, foreign ventures play at best only an indirect role on changes to domestic entrepreneurship through their short-term effect on knowledge stocks. However, since knowledge stocks appear to have a very important effect on domestic entrepreneurship in the long-term, the indirect effects of foreign ventures should not be discounted.

Table 8. Bootstrapping for Mediation (5000 times).

	Bootstrapped Estimate		
	Effect	SE	
Unemployment (Short-term)	-0.001***	0.000	Mediation supported
Unemployment (Long-term)	-0.001	0.002	Mediation NOT supported
Knowledge Stock (Short-term)	-0.003**	0.001	Mediation supported
Knowledge Stock (Long-term)	0.003	0.005	Mediation NOT supported

*** Significant at 0.001 level; ** Significant at 0.01 level; * Significant at 0.05 level, † Significant at 0.10 level.

Notes: The mediation model includes two steps: Foreign Ventures to Unemployment/Knowledge Stock; and Unemployment/Knowledge Stock to Domestic Entrepreneurship.

Short-term refers to 1-year lag in each step. Long-term refers to 5-year lag in each step.

To further test the mediating effects of unemployment and knowledge stock, we used the bootstrapping technique (Table 8). Consistent with our four-step analysis, it appears that both unemployment and knowledge stocks mediate the relationship between foreign ventures and

domestic entrepreneurship in the short-term. In the long-term, the mediations were not significant.

6.2. Robustness tests

To ensure our primary results are not artifacts of the way we measured the variables, we ran a number of robustness tests (the results are available from the first author upon request). First, besides using one-year and five-year lags between the independent and mediator variables, as well as between the mediator and dependent variables to distinguish short-term and long-term effects, we also use no lags and ten-year lags as robustness checks of our short-term and long-term findings. These robustness tests yield findings that are consistent with the primary results.

Furthermore, we changed the time lags between the dependent variable and control variables from one-year, to five and ten years, respectively. Due to the unbalanced structure of the data, this substantially reduced the sample sizes for the analysis. Nonetheless, the regression results are still qualitatively comparable to our primary results.

Finally, it is possible that developing economies differ from developed economies in terms of the relationships between foreign ventures, unemployment, knowledge stocks, and domestic entrepreneurship. To investigate this possibility, we re-ran our analyses using only observations from developed economies. The results are supportive of our hypotheses. Therefore, we conclude our results are robust.

7. Discussion

Our empirical results suggest that the presence of foreign ventures might change the structure of domestic entrepreneurial activities such that in the long run, necessity-driven entrepreneurship might be suppressed, whereas opportunity-driven entrepreneurship might be stimulated. Put differently, the contribution of this study to the entrepreneurship literature goes beyond a simple comparison of necessity-driven and opportunity-driven entrepreneurship (e.g. Nikolaev et al., 2018). In fact, our theoretical model, hypothesis development, and empirical findings all imply that the effects of foreign ventures on domestic entrepreneurship might be *structural*, in that in the long run, the presence of foreign ventures measured by their direct investment in a domestic economy might lead to the replacement of necessity-driven entrepreneurship by opportunity-driven entrepreneurship. Although we were only able to partially substantiate this contention, our findings suggest a different pattern of relationships from that of previous studies (e.g. Nikolaev et al., 2018). Instead of suggesting that all entrepreneurial activities are equivalent and exploring the factors that might affect them all, we focus on the factors that might reduce one type and increase the other type.

Given the fact that opportunity-driven entrepreneurship is superior to necessity-driven entrepreneurship in terms of its impact on a domestic economy (Block et al., 2015, Dencker et al., xxxx, Nikolaev et al., 2018), our study has important implications for public policy. For example, the entry of foreign ventures can be encouraged or discouraged and the impact of their entry on unemployment and entrepreneurship can be direct and indirect. Directly, foreign ventures seem to decrease both unemployment and entrepreneurship. Indirectly, foreign ventures

seem to increase knowledge stocks, mainly in the short-term (Batten and Vo, 2009, Batten and Vo, 2015, González-Pernía and Peña-Legazkue, 2015). Knowledge stocks, in turn, seem to be negatively associated with domestic entrepreneurship in the short-term, but positively associated with long-term increases in domestic entrepreneurship (Gavious and Milo, 2019, Ghio et al., 2015). Overall, this suggests that foreign ventures might have a two-pronged direct and indirect impact on economic development.

Another line relevant to our inquiry is endogenous growth theory, which claims that entrepreneurship is an *endogenous* factor that affects and is affected by economic growth (Acs and Sanders, 2013, Braunerhjelm et al., 2010, González-Pernía and Peña-Legazkue, 2015). In combination with the necessity- and opportunity-driven entrepreneurship dichotomy, the theory predicts that structural changes in domestic entrepreneurship are endogenously driven. That is, as a domestic economy grows, we would automatically have more opportunity-driven entrepreneurship and less necessity-driven entrepreneurship. By contrast, our study explores the impact of foreign ventures as an exogenous influence on domestic entrepreneurship (González-Pernía and Peña-Legazkue, 2015, Pathak et al., 2015). Our findings suggest that although entrepreneurship is an endogenous driver of economic growth, exogenous factors also play a role. Hence, this study complements endogenous growth theory by suggesting that policy-makers can craft initiatives that facilitate the emergence of certain exogenous factors, such as foreign ventures, to alter the structural dynamics of endogenous entrepreneurial activities (Angulo-Guerrero et al., 2017, Danakol et al., 2017, Du and Rouse, 2018).

We also highlight the “timing” issue in our hypothesis development. Our analysis shows that foreign ventures have both positive and negative effects on domestic entrepreneurship, although the directions and magnitudes vary over time. Indeed, focusing on temporality might shed further light on the determinants of entrepreneurship since it appears that the importance and impact of factors such as unemployment and domestic knowledge stocks can change dramatically and that these changes might be at least partially due to exogenous influences (Bird and West, 1998, Mosakowski and Earley, 2000).

7.1. Limitations

This study also has a number of limitations which may provide opportunities for future research. First, we develop our hypotheses largely based upon the dichotomy of necessity- and opportunity-driven entrepreneurship. We use two mediating effects (unemployment and knowledge stocks) that were presumed to primarily impact one type of entrepreneurship or the other, with unemployment impacting necessity entrepreneurship and knowledge stocks impacting opportunity-driven entrepreneurship. Nonetheless, we did not measure necessity- and opportunity-driven entrepreneurship directly. This is partially a consequence of data restrictions at the macro level. However, future studies should attempt to use measures that are directly related to these two types of entrepreneurship.

Second, we use self-employment as a measure of domestic entrepreneurship. Although this measure has been extensively used in the literature (e.g. Bosma and Harding, 2007), it has limitations. For instance, the methods to collect self-employment statistics vary among countries (Reynolds et al., 2005). In addition, it indiscriminately measures all types of individual

entrepreneurial activities, treats all self-employed ventures as homogenous, and ignores entrepreneurial activities emanating from existing companies, both large and small. Future studies using different measures of entrepreneurship are therefore in order.

Third, although we incorporated a few developing and transitional economies in the database to increase generalizability, this type of economy is still limited in our sample. This is largely due to the fact that developing economies often have incomplete data. Future research should attempt to use different databases to include more developing countries. Similarly, future studies might want to test the hypotheses using different time frames.

Finally, we did not include any observation after the year 2008, largely to exclude the effect of 2008 financial crisis from our empirical model. Future researchers might want to replicate our study and validate our model in different periodic terms.

7.2. Conclusion

Built upon the literature of necessity- and opportunity-driven entrepreneurship, we argue that foreign ventures influence domestic entrepreneurship through the mediating effects of unemployment and knowledge stocks. Unemployment captures a primary cause of necessity-driven entrepreneurship while knowledge stocks captures a primary cause of opportunity-driven entrepreneurship. We test our models on panel data from 30 countries between 1980 and 2008. We find that the presence of foreign ventures seems to affect the structure of domestic entrepreneurship by altering the balance between necessity-driven and opportunity-driven entrepreneurship in the short- and long-term.

Authorship contribution statement

Hanqing Fang: Conceptualization, Methodology, Software, Validation, Writing - original draft. **James J. Chrisman:** Conceptualization, Methodology, Validation, Writing - review & editing. **Esra Memili:** Conceptualization, Validation, Writing - original draft, Writing - review & editing. **Minglin Wang:** Funding acquisition, Methodology, Software, Validation.

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