Exploring Relationship Between Foreign Competition and Entrepreneurship[*]

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Abstract

Globalization has increased trading activity among countries. In this article, we examine how foreign competition and human capital influence entrepreneurial activity in the host country over time. We propose that foreign competition fosters knowledge spillovers and consequently leads to new firm entry. We build on the competence based argument to suggest that these spillovers are strengthened by the availability of human capital. Based on a comprehensive panel dataset of employees and new firms in Portugal between 1994 and 2008, our findings demonstrate that the impact of foreign competition on domestic entrepreneurial activity is not always positive rather the availability of human capital moderates this relationship. We also find strong support for the positive effect of foreign competition on quality of the initial team. Our results are supported using several robustness analysis.

JEL: J63, L26, L25.

Keywords: Foreign competition, firm entry, human capital, founders, initial workforce

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Globalization has increased trade relations between nations over the years. However, the question regarding the gains from foreign competition remains open. Previous literature has argued that foreign competition increases productivity in the host country through positive spillovers (Bloom, Draca & Van Reenen, 2015; Buckley, Clegg, & Wang, 2007; Feinberg & Majumdar, 2001; Spencer, 2008; Zhang, Li, Li, & Zhou, 2010). Also, foreign competition changes firm's ownership and management styles, and it increases competition for resources and market share in the host countries (Bandelj, 2008; Graham & Krugman, 1995). The consequences of foreign competition are important because it affects not only economic growth and productivity (Eaton & Kortum 2002, 2001; Frankel & Romer, 1999; Cartiglia, 1997; Rodrik, 1997; Yanikkaya, 2003; Grossman & Helpman, 1990; Manning, 1982) but also the political and cultural activity in a country (Coyne & Williamson, 2012; Wacziarg, 2001; Varsakelis, 2001; Rodrik, 1998). At the firm-level, foreign competition is responsible for reshuffling resources and output from less to more efficient firms (Melitz, 2003; Pavcnik et al., 2004; Bernard, 2006a,2006b), for technology upgrading (Freeman & Kleiner 2005; Bloom, Draca & Van Reenen, 2015), and for increasing offshore activities (Feenstra & Hansen, 1996). With all these changes occurring, scholars have argued that spillovers of increased competition are likely to occur over a long period of time. Spencer (2008) pointed out that the "benefits stemming from access to knowledge are likely to take a substantial period of time to accrue (p. 347). These trends reflect the need for increased attention to foreign competition's influence on the economic outcomes of the host country.

In this study, we set out to address three problems. First, we use the data over a decade to examine the role of foreign competition on entrepreneurship. In this paper, we adapt the view of entrepreneurship as a new firm entry, as noted by Lumpkin & Dess (1996: 136) the "essential act

of entrepreneurship is new entry. New entry can be accomplished by entering new or established markets with new or existing goods or services. New entry is the act of launching a new venture, either by a start-up firm, through an existing firm, or via internal corporate venturing." Second, we will examine the moderating role of human capital on the relationship between foreign competition and new firm entry. We seek to provide insight into the importance of human capital in identifying opportunity as foreign competition increases. Third, we analyze the composition of the founding teams to investigate how the initial team is affected when a new venture faces foreign competition. This evidence will provide additional insights into how foreign competition influences decision makers (in this case a group of individuals) perspective in a changing environment.

To illustrate these issues, we examine Portugal manufacturing sector before and after China accession to the World Trade Organization. We analyze trade with China because, over the last two decades, the country exports have increased more than 15% per year (Bloom, Draca & Van Reenen, 2015). There are three reasons why our examination of the Portuguese manufacturing sector holds particular promise. First, the relative importance of the Portuguese manufacturing sector has declined significantly over the last two decades. Second, Portugal is likely to bear the brunt of China's competitive advantages because a substantial part of its production and exports is concentrated in either labor-intensive goods or on labor-intensive stages of the production cycle. Consequently, Portugal competes in the same industries as China. Third, we have access to extraordinary panel data on new firms and their initial workforce. Our analysis draws on a matched employer-employee dataset from *Quadros de Pessoal* combined with international trade data from Eurostat over a long time period, from 1994 to 2008. The data cover detailed information about all manufacturing workers and entrepreneurs and their background history.

Also, our data make it possible to match founders and their initial team with new ventures characteristics.

The topics raised in our study are theoretically appealing because they emphasize foreign competition as a source of knowledge as well as a business opportunity for the host country. Additionally, it is reasonable to assume that increased foreign competition will put downward pressure on wages (Auer et al, 2013) and consequently trigger individuals to search for alternative occupations, possibly become an entrepreneur. The quality of the entrepreneurial activity either productive or unproductive will depend on the motivation of the entrepreneur (Baumol, 1996). Thus, understanding how increased trade affects entrepreneurial activity is important to welfare analysis and to enable policy makers to develop sound policies toward the high-quality firm entry.

Our study provides valuable insights regarding foreign competitions impact on domestic firm entry. Our findings demonstrate that the impact of foreign competition on domestic entrepreneurial activity is not always positive rather the availability of human capital moderates the relationship between foreign competition and entry. We propose that foreign competition fosters knowledge spillovers and consequently leads to new firm entry. This study demonstrates that the entrepreneurship literature needs to develop new theories with regards to access to resources in different context. Also, we find strong support for the positive effect of foreign competition on quality of the initial team. Entrepreneurial firms are in need of various resources and rarely possess all the required resources for exploring/exploiting opportunities and for being successful. Thus, the initial team serves as a buffer against liabilities of newness as it allows the start-up to establish credibility with customers, and to create an institutional identity

(Stinchcombe, 1965). This research brings new light to the role of teams on entrepreneurial activity when facing foreign competition.

The organization of the paper is as follows. Section 2 reviews the related literature. Section 3 presents the methodology. Section 4 reports and discusses the empirical results. Section 5 is the conclusion and discussion followed by the limitation of the study.

LINKING LITERATURE RELATED TO FOREIGN COMPETITION AND ENTREPRENEURIAL ACTIVITY

Foreign Competition and Entry

Foreign competition can be a 'double-edged sword', it can have positive as well as negative impacts on the economy. On one hand, foreign competition fosters the adoption of new technology and uncovers business opportunities. On the other hand, it can force firms to go out of business, reducing the demand for unskilled workers.

Models of international trade with heterogeneous firms predict that, in the short run, foreign competition increases the minimum productivity level that is required to stay in business, and consequently reduces the number of firm entries (Melitz, 2003; Bernard, 2006a). Grossman (1994) suggest that the number of local entrepreneurs decreases as margins and prices are squeezed by foreign competition. Foreign firms compete for the same customers and crowd out domestic firms that have fewer resources (De Backer & Sleuwaegen, 2003)[1], increasing the barriers to entry for new firms.

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[1] Faced with increased import competition, low-tech firms shrink or fail while high-tech firms are sheltered out (Bloom, Draca & Van Reenen, 2015).

Although increasing imports imply higher competitive pressure for firms, it also creates more business opportunities and promotes innovation. Individuals with entrepreneurial characteristics and opportunity recognition ability will be able to take advantage of this newly created opportunity or fill in the void created. In general, entrepreneurs in a society act as 'gap fillers' by discovering and exploiting opportunities (Schumpeter, 1942, Shane & Venkataraman, 2000). An entrepreneur with appropriate resources such as institutional support, human capital and financial resources can explore and exploit opportunities to create new products, new processes, or new markets (Stenholm et al. 2013; Bowen & De Clercq, 2008; Fairlie & Krashinsky, 2012; Hurst & Lusardi, 2004; Gentry & Hubbard, 2004; Quadrini, 1999; Evans & Jovanovic, 1989).

Foreign competition helps host country entrepreneurs to uncover entrepreneurial opportunities in several ways. A series of Eaton & Kortum's studies (2002, 2001) found that foreign competition influences growth in the local area through technology spillovers. Existing studies define spillover as transfer or diffusion of knowledge in the host country due to the presence of the foreign competition (Kim & Li, 2014; Meyer, 2004). Acharya & Keller (2009) found that imports play an important role in technology transfer process. Also, Bloom, Draca & Van Reenen (2015) found that increased import competition with China caused a significant technological upgrading in European firms through both faster diffusion and innovation. They use several measures of technical change and innovation namely patenting, IT intensity and R&D expenditure. Thus, foreign competition pushes new and existing firms to develop new products. To escape competition, high productive firms compete on quality, using their productivity advantage to upgrading their mix of products (Melitz, 2003; Bernard, 2006a). Additionally, new products, services, or processes introduced by foreign competitors increase the demand in the host country (O'Malley & O'Gorman, 2001). On the other hand, entrepreneurs in

the host country can take advantage of this increased demand by imitating foreign products (Javorcik, 2004). Since the host country entrepreneur has local knowledge, which a foreign competitor lacks, he/she can improve on the existing product. Also, local entrepreneurs can uncover new markets that foreign competitors are not aware of or overlooked (O'Malley & O'Gorman, 2001). Both foreign competitors and local entrepreneurs can benefit each other by combining their competitive advantage, also known as 'forward linkage' (Ayyagai & Kosová, 2010). Foreign competitors lack local connections or relationships with appropriate local business and professional organizations (Ayyagari & Kosová, 2010; Blalock & Simon, 2009; Javorcik, 2004). In contrast, local entrepreneurs can take advantage of these networks to reach new markets. Another venue through which foreign competition can spur entrepreneurial activity in a country is by partnering with local entrepreneurs. By partnering with local entrepreneurs, they can produce new products that are more suitable for the local market (Pitelis & Teece, 2010). Thus, foreign competition increases local demand for new or improved products, new or improved processes, or creates new markets leading to increases in entry rates.

Another mechanism through which foreign competition triggers entrepreneurial activity is job displacements. The common view is that foreign competition reduces employment (Revenga, 1997), particularly among low-skilled workers (Autor, Dorn, & Hanson, 2013). To respond to foreign competition, firms adopt technologies and activities that favor high skilled workers (Yeaple, 2005) or switch to high-quality products and hence labor quality (Verhoogen, 2008). Neoclassical economist argued that this "skill-based technical change" forces a group of individuals out of labor market.[2] Individuals who lack the needed skill move to entrepreneurship

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[2] Another view argues that import competition might not lead to an increase in the demand for skill. In fact, the new technologies might be used to replace skilled workers or even expand tasks performed by the unskilled workers (Goos, Manning & Salomons, 2009; Acemoglu & Autor, 2011; Goos, Manning & Salomons, 2010).

because of the shortage of alternative job opportunities (Storey, 1994) but also due to changes on their risk frame. In loss frame events, individuals become more receptive to bear the risk.[3] On these grounds, high rates of or increases in, unemployment would lead to higher rates of new firm formation.

To sum up, we argue that foreign competition may reduce or trigger entrepreneurial activity. Nevertheless, as both push and pull effects positively affect entrepreneurial activity, [4] we expect:

Hypothesis 1: Increase in foreign competition has a positive relationship with firm entry.

Moderating Role of Founder's Human Capital on Foreign Competition and Entry

Foreign competition affects individuals in different ways depending on labor market configuration and their level of human capital. Human capital includes both formal knowledge acquired through formal education and training as well as tacit knowledge acquired through work experience and non-formal education (Davidsson & Honig, 2003). It also pertains to generic and specific human capital (Becker, 1975; Colombo & Grilli, 2005). Specific human capital is industry or firm specific (Dakhli & De Clercq, 2004; Siegel, Siegel, & MacMillan, 1993; Sandberg, 1986). Individuals with higher human capital are generally more likely to become founders, and founders' human capital largely determines the initial conditions of the start-up such as their initial size (Colombo et al. 2004; Mata & Machado 1996), their chances of surviving (Brüderl et al., 1992) and their growing prospects (Colombo & Grilli 2005; Bosma et al. 2004; Koeller & Lechler 2006). An entrepreneur with high human capital will have the inspiration to grow and to build a successful venture (Shepherd & DeTienne, 2005; Ardichvili et

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[3] The prospect theory suggests that individuals are more willing to bear risk in loss frame events (Kahneman & Tversky, 1979). Being unemployed is likely to make individuals more receptive to risk.

[4] If an individual takes on entrepreneurial activity in order to meet the basic need then he/she is pushed into entrepreneurship. On the flip side, if an individual enters into entrepreneurial activity at his/her own will and ability by recognizing an opportunity, then it would reflect 'pull' effect.

al., 2003; Mitchell et al. 2002). Also, founders with higher human capital are more efficient in organizing and managing operations, in attracting customers, negotiating better contracts with suppliers and raising more capital from investors (Brüderl et al., 1992).

Human capital that is transferable across firms and industries is important for running a business (Becker, 1993) but also for perceiving and interpreting unconnected information (Schultz, 1975). Thus, individuals with high human capital are more likely to recognize and pursue an opportunity (Davidsson & Honig, 2003; Arenius & DeClercq, 2005; Arenius & Minnitti, 2005; Shepherd & DeTienne, 2005; Busenitz et al., 2003). Levie & Autio (2008) presented that higher level of education is positively related to identifying entrepreneurial opportunity. Shane & Venkataraman (2000) posited that "two broad categories of factors that influence the probability that particular people will discover particular opportunities: (1) the possession of the prior information necessary to identify an opportunity and (2) the cognitive properties necessary to value it" (p. 222). Entrepreneurs with industry specific knowledge are better able to recognize an opportunity than someone who does not possess that information. Ucbasaran et al. (2008) presented that "specific human capital may represent a better ''guide'' for entrepreneurs to identify opportunities than general human capital alone" (p. 158). Foreign competition creates entrepreneurial opportunity in the local market and individuals with high human capital are better prepared and able to recognize an opportunity and take advantage of that.

Entrepreneurs do not always pursue all the opportunities they identify (Shane & Venkataraman, 2000; Witt, 1998), rather the cost of pursuing the opportunity can be an important component of an entrepreneur's decision. If the opportunity cost of exploiting an opportunity (ex. independence, time, effort, money) is lower for an individual then staying in the

regular wage job then he/she will transition to entrepreneurship. Individuals with higher human capital have higher expectations than their counterparts. Bowen and De Clercq (2008) found a positive relationship between higher education and starting high-growth oriented businesses. Therefore, entrepreneurs with high human capital can use their knowledge to pursue the attractive opportunity.

To sum up, the spillover effect of foreign competition on entrepreneurship can be influenced by the availability of human capital. Based on the arguments above, we expect:

Hypothesis 2: The positive relationship between foreign competition and entry is strengthened by the availability of highly qualified individuals.

Linking Foreign Competition and Initial Team

Existing literature suggests that foreign competition increases the productivity of domestic firms as well as the quality of domestic products (Aitken & Harrison, 1999; Blomström & Kokko, 1998; Buckley et al., 2007; Feinberg & Majumdar, 2001; Zhang et al., 2010). For an entrepreneur to imitate or to create a new product and create a new organization/venture, the characteristics of the founding team are an important resource (Chandler & Hank, 1998).

The competence-based studies argue that the combination of unique capabilities are the main sources of firm's competitive advantage (Grant, 1996). For instance, a production process involves teamwork and in order for the process to be successful, members of the team need to have complementary skills and share these skills to complete the tasks (Kremer 1993; Alchian & Demsetz 1972). Therefore coordinating a team of people who can complement each other can create a productive organization. Existing literature has established that people can be an important resource as it helps to create a sustainable competitive advantage (Prahalad. 1983;

Pfeffer, 1994; Wright, McMahan, & McWilliams, 1994). High-quality initial workforce creates a competitive advantage for a new venture. For example, Mata and Portugal (2002) argue that the education of a firm's workforce can be regarded as a measure of ownership advantages. Dahl and Klepper (2008) find that employees hired in the earliest stages of the start-up are a key element of future firm success. Members of the initial team can divide tasks among members in an efficient manner to be productive. Also, the initial team helps new ventures to overcome resource constraints. At the initial stage of its life cycle, venture needs several crucial resources. In order to acquire these resources, they need to establish legitimacy and overcome the liability of the newness (Carroll & Delacroix, 1982; Aldrich & Auster, 1986; Stinchcombe, 1965), also known as "soft power" (Santos & Eisenhardt, 2009). Soft power is defined as "….subtle influence mechanisms that cause others to willingly behave in ways that benefit the focal agent" (Santos and Eisenhardt, 2009: 663). The initial team can use their previous networks, experience to establish legitimacy.

Founders and initial team rely on each other to learn new tasks (Stinchcome, 1965) and to establish new roles and routines (Choi & Shepherd, 2005; Nelson & Winter, 1982). By establishing routines, these new ventures gradually reduce inefficiency. The initial team members help ventures to gain legitimacy. The high-quality initial team can also help new ventures to acquire the necessary resources to either compete with or form an alliance with foreign competition. Studies have shown that ventures capitalists often use the availability of human capital as selection criteria for investing in the firm; in this case, human capital is considered an important criteria as founders' management skills and experience (Zacharakis & Meyer, 2000). Therefore, the initial workforce can give the venture capitalist the confidence to make an investment in the firm.

At the initial stage, general and industry-specific human capital, leadership style, and mental models are helpful for creating a successful new venture (Coad, 2014; Kazankian & Drazin, 1989; Miller & Friesen, 1984). The effective management of this human capital may ultimately determine the success of the new venture (Adler, 1988; Reich, 1991). Therefore, we expect the initial team members to be hired based on their technical skills to complete tasks and to fit the organizational culture (Timmermans, 2010; Aldrich & Ruef, 2006). Initial teams with a high level of human capital create organizational memory, culture and norms that are conducive to entrepreneurial activity.

Availability of human capital can also help in the knowledge transfer process in an organization.[5] Cyert & March (1963) argued that in an organization individuals learn from each other through interactions by sharing the information and knowledge they already have from previous experience and new knowledge acquired through different sources such as customers, suppliers, and other stakeholders in the new venture. A venture with high human capital is better able to absorb and apply this knowledge to create competitive advantage (Argote & Ingram, 2000).Based on this logic, we hypothesize that:

Hypothesis 3: Foreign competition positively impacts the quality of the initial team.

Figure 1 shows the hypotheses presented in the paper. H1 and H3 reflect the direct effect of foreign competition on entry and initial team. H2 present the moderating effect of human capital on foreign competition and firm entry.

[INSERT FIGURE 1 ABOUT HERE]

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[5] Singley & Anderson (1989, p. 1) defined transfer at the individual level as "how knowledge acquired in one situation applies (or fails to apply) to another."

PORTUGAL MANUFACTURING SECTOR

Portugal manufacturing sector has always been an important source of employment. Nevertheless, the relative importance of this sector has declined significantly in the last two decades. Between 1994 and 2009, more than 342,000 individuals lost their jobs, and the number of firms decreased by 11,645, corresponding to 34% and 22% reduction, respectively. In 2009, the Portuguese manufacturing sector employed 21% of total workers and accounted for 13% of total firms.

Figure 2 plots the evolution of firms and employment in the Portuguese manufacturing sector from 1990 to 2009. The solid line represents the total number of employees while the dashed line represents the total number of manufacturing firms. The vertical line marks the year when China became a member of the World Trade Organization.

[INSERT FIGURE 2 ABOUT HERE]

Several events are responsible for the declining trajectory. Until the early 90s, Portugal was a low wage economy with privileged access to the European market. The country signed several trade agreements: the first with the European Free Trade Association (EFTA) in 1959 and subsequently with the European Union (EU) in 1973, followed by full membership in 1986. Before the EU integration, the government devaluated the national currency and implemented policies of import substitution as a way to increase the export potential of manufacturing sector.

However, Portugal's competitive position gradually diminished due to the enlargement of the EU and the imposition of a fixed exchange rate. In 1989 and 1990, the barriers facing exports from Central and Eastern European Countries (CEEC) decreased and were completely eliminated by 1998/1999. At the same time, in 1992, the Portuguese currency, escudo, entered

the exchange rate mechanism of the European Monetary System and the currency was linked to other European currencies. This fact led to currency appreciation, making the costs of labor and capital rise. Also in 1999, Portugal joined the eurozone. On December 11, 2001, China entered the World Trade Organization (WTO) and all quotas and trade barriers with China were progressively removed and totally eliminated by 2009. Since then, the Portuguese manufacturing sector reduced their size in the economy and their importance in trade.

METHODOLOGY

Data Sources, Sample, and Measurements

We combine a longitudinal matched employer-employee database, *Quadros de Pessoal* (QP) with the EUROSTAT database on international trade.

QP database originates from a mandatory survey submitted annually to the Portuguese Ministry of Employment and Social Security by Portuguese private firms with at least one paid employee. The database has detailed information at the individual and firm level. As individuals and firms are cross-referenced by a unique identifier, the database makes it possible to identify the founders and their initial workforce.

With these data, we construct two databases: individuals and entrepreneurs databases. For the first database, we select all individuals with age between 19 and 59[6] who worked in manufacturing firms in mainland Portugal between the period of 1993 and 2007.[7] To reduce the number of multiple observations per individual, we ensure that an individual only appears once

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[6] We select this age range to exclude individuals with limited career histories and close to retirement.

[7] We focus our analysis in the period between 1994 and 2008 to exclude the effects of the economic and sovereign debt crises. The economic crisis is considered to have started in 2009, the first year with negative GDP growth in every quarter (with a contraction of around 2%). Due to the high levels of public deficit and public debt, the country requested a bailout package from the International Monetary Fund and European Union in April 2011.

in the data. Next, we identify their background history and analyze their employment status in the following year (1994 and 2008). Individuals can either continue working as paid employees, move to entrepreneurship or become non-employed.[8] In total, we have a sample of 1,214,502 individuals, of whom 34,378 are entrepreneurs. These data allow us to evaluate the impact of foreign competition on firm entry and compare the characteristics of founders and non-founders in specific years.

The second database, entrepreneurs' database, allow us to evaluate the characteristics of the initial team. From QP, we select all manufacturing start-ups established in mainland Portugal between 1994 and 2008. In a second step, we identify the founders and their background history.[9] As in the previous database, we restrict data to founders between 20 and 60 years of age. Finally, for each start-up, we identify the initial workforce hired in the entry year. We exclude start-ups were the only employees are the founders. We ended up with 10,037 founders and 36,683 employees of 7,068 new firms.

Next, we use trade information from the EUROSTAT international database to construct our measure of foreign competition. This database captures all bilateral international transactions by product level between European countries and any country in the world. We select imports from China to Portugal and aggregate them from eight-digit product level to four-digit ISIC (rev 3.1) industry level using the Pierce & Schott (2010) concordance. Our measure of foreign

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[8] Non-employed individuals includes unemployed, self-employed and civil servant individuals. The database does not allow us to accurately distinguish between these cases.

[9] We exclude start-ups for which we could not identify at least one founder or their background history. For each individual, QP includes some cases in which the record changes in gender and year of birth. We consider observations with multiple changes in the gender or year of birth to be errors, corresponding to individuals whose identification number was not recorded, or wrongly identified by the respondent. We drop individuals whose gender and year birth change in more than 75% of the total number of observations.

competition evaluates the exposure of a region to Chinese imports[10] and it is derived from the

Eaton & Kortum (2002) model of trade[11] and adapted by Autor, Dorn & Hanson (2013) to

account for regional economies. We use:

$$FC_{cy} = \sum_j \frac{E_{jcy}}{E_{jy}} \times IMPS_{PTjy} \tag{1}$$

where c denotes county, y denotes year and j denote industry.

We apportion the value of imports originating from China $\left(M_{jy}^{China}\right)$ as a share of total world

imports to Portugal $\left(M_{jy}^{World}\right)$ by four-digit industry and year $\left(IMPS_{PTjy} = \frac{M_{jy}^{China}}{M_{jy}^{World}}\right)$ to a region

according with their initial share of industry employment. The fraction $\frac{E_{jcy}}{E_{jy}}$ represents the

county's start of the year share of total employment in industry j. A region is more exposed to

foreign competition when it accounts for a larger share of industries experiencing an increase of

imports from China. There are 278 counties in mainland Portugal, each of them with substantial

geographic variation in terms of industry specialization. Most of the industries are agglomerated

on specific counties. For instance, the footwear industry is concentrated on Felgueiras, Santa

Maria da Feira and Oliveira de Azemeis and the glass industry is located in Marinha Grande and

Alcobaça.

Further details of our data construction and measures are provided in Appendix A.

Model Specification: Entry and Founders Profile

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[10] We use China import surge because the country experienced productivity gains, transitioned to a market oriented economy, and had its quotas and trade barriers eliminated due to its accession to the WTO in 2001. See Branstetter & Lardy (2006) for a detail review of the factors that drove China's export growth.

[11] Eaton & Kortum (2002) develop a Ricardian trade model that incorporates differences in technology, input costs and geographic barriers. Their model bears semblance to the standard gravity model.

To evaluate if foreign competition increases firm entry, we estimate the following model using the individuals' sample:

$$Entry_{iy} = \theta_y + \alpha_j + \omega_c + \beta FC_{cy} + X_i'\lambda + \epsilon_{ijcy} \tag{2}$$

where i denotes an individual, c denotes county, y denotes year and j industry.

$Entry_i$ is an indicator variable that equals 1 if individual i founds a start-up, and 0 if that individual does not open a firm. We measure FC_{cy} as the weighted average of China import share in county c and year y. Our empirical strategy relates the probability that any individual found a start-up to foreign competition measured at the county level.[12] Our first hypothesis predicts that $\beta > 0$, suggesting an increase on firm entry due to an increase on foreign competition.

Our estimation strategy intends to capture the supply side effect of China import increase. However, if Chinese imports are related to demand side effects, then our estimates may underestimate the true impact as both firm entry and Chinese imports may be correlated with unobserved shocks to demand. To account for the potential endogeneity of our foreign competition variable, we employ the instrumental variable strategy. We argue that the growth in Chinese imports stems from the rise in manufacturers competitiveness, lower trade barriers, dismantle of central planning and accession to the WTO. Similarly to Autor, Dorn & Hanson (2013), we use as instrument:

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[12] Our empirical approach is closely related to a large body of literature studying the impact of trade on the labor market and using regional economies as unit of analysis (see for example, Kovak (2010); Topalova & Khandelwal (2011); Autor, Dorn & Hanson (2011). Alternative estimation strategies treat industry or occupation as the unit of analysis (Bernard, Jensen &Schott, 2006b; Ebenstein et al., 2009; Edwards & Lawrence, 2010; Bloom et al., 2015).

$$FCI_{cy} = \sum_j \frac{E_{jc(y-5)}}{E_{j(y-5)}} \times IMPS_{USiy} \qquad (3)$$

The instrument differs from the foreign competition measure in two respects. First, in place of Chinese import share to Portugal ($IMPS_{PTiy}$), it uses Chinese import share to the US ($IMPS_{USiy}$). Second, in place of the start-of-year employment levels by industry and region, this expression uses employment levels from the prior five years. The employment levels on a region might be affected by anticipated China imports, thus we use lagged employment to mitigate this simultaneity bias. Nonetheless, if the demand shocks are correlated between Portugal and the US both our estimates understate the true effect of foreign competition on firm entry.

Equation 2 also includes a vector of individual characteristics, X_i: gender, which equals 1 for men, 0 for women; two variables for founder's age (age and age squared); foreign nationality, which equals 1 for foreign individuals, 0 for Portuguese individuals; two indicator variables for education: "medium education" for individuals with a high school diploma or equivalent, and "high education" for those reporting bachelor's degree or more advanced degree; tenure, measured as the logarithm of the number of years of work experience in the last job; non-employment, which equals 1 for individuals absent of the database in the prior year, 0 otherwise.[13] In reporting the estimated coefficients, our omitted categories are female individuals who did not finish high school.

This specification also includes year dummies, θ_y to control for the macroeconomic setting; regional dummies, ω_c, to control for regional differences in start-up dynamics and region-specific economic development; and industry dummies, α_j, to account for heterogeneous

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[13] In this case, non-employed individuals are new entrants to the labor market, unemployed, self-employed or public servant individuals.

entrepreneurial opportunities across industries. Standard errors for this specification are clustered at the start-up level.

Model Specification: Initial Team Profile

Next, we evaluate if foreign competition affects the quality of the initial workforce by estimating the following model using the entrepreneurs' database:

$$Team_{iy} = \theta_y + \alpha_j + \omega_c + \beta FC_{cy} + X_i'\lambda + \epsilon_{ijcy} \qquad (4)$$

where i denotes founder, c denotes county, y denotes entry year and j industry.

Our dependent variable evaluates the educational level of the initial workforce using two variables: the share of workers with high school diploma (share of medium educated workers) and the share of workers reporting bachelor's degree or more advanced degree (share of high educated workers).

Again, we are interested in the coefficient associated with foreign competition, FC_{cy}. We expect this coefficient to be positive and statistic significant.

Also, we control for founder demographic and educational characteristics because existing literature suggest that founders with high human capital are more likely to hire highly qualified workers (Hayine et al. 2012; Dahl & Klepper, 2008). We include founders' gender, age, and age squared, foreign nationality, high and medium education and industry experience. The latter variable is measured by a dummy variable equaling 1 for founders that previously worked on the same four-digit industry code, 0 otherwise. Additionally, we control for the initial size of the venture because ventures with larger labor workforce have more human capital and more resources (Klepper, 2001). In reporting the estimated coefficients, our omitted categories are female founders who did not finish high school.

RESULTS
[INSERT TABLE 1 ABOUT HERE]

Table 1 reports the descriptive statistics for the individuals' sample separately for entrepreneurs and workers. Workers are mostly male (54%), medium educated (13%), highly educated (5%), foreign nationality (3%) and are 32 years old, on average. Their hourly income is 3.90€and they worked for 5 years on average and 2% of them previously set up a new venture. Entrepreneurs are older (39 years old), more educated, medium educated (14%), highly educated (7%), and earn larger earnings (4€per hour). The great majority of them (83%) have entrepreneurial experience.

[INSERT TABLE 2 ABOUT HERE]

Table 2 presents the descriptive statistics for the entrepreneurs' database. On average, start-ups are established by one founder and after the first three years, approximately 1,845 firms fail corresponding to a mortality rate of 26%. Start-ups are small and employ on average six workers. The initial workforce earns on average 522 Euros and only 9% and 2% of them have medium and high education, respectively. Founders in our sample are mostly male (71%), low educated (80%) and with 37 years of age. On average, 23% of the founders establish their venture in the same industry where they previously worked.

[INSERT TABLE 3 ABOUT HERE]

Table 3 reports the regional average of our foreign competition measure for the years 1994, 2000 and 2008 considering different countries: China, Central Eastern European Countries (CEEC), low-income countries and high-income countries. CEEC include Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia, and Slovenia. High-income countries include Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland.

The selection of low-income countries follows the World Bank definition in 1993, excluding China. On average, a region faced foreign competition from China of 0.5% and 1.1% in 1994 and 2008, respectively. These numbers reflect the rise of Chinese imports share. Águeda and Lisbon are the counties more affected by Chinese competition. From 1994 to 2008, China competition increased by 0.59%. For comparison, the next columns provide our foreign competition measure using the import share from CEEC, low-income countries (excluding China) and a group of high-income countries. Except for high-income foreign competition, foreign competition from CEEC and low-income countries grew over time. For example, the CEEC and low-income foreign competition grew by 0.46% and 0.17%, respectively. Nevertheless, this expansion was smaller than in the case of Chinese foreign competition.

[INSERT TABLE 4 ABOUT HERE]

Table 4 presents the results for equation 2. Models 1, 2, and 3 show the estimates for the probit model while Models 4 and 5 the IV-probit estimates. Model 1 features our main variable of interest, foreign competition, and year, industry and region fixed effects. The coefficient of foreign competition is negative (β= -0.477, $p < 0.10$), suggesting that an increase in foreign competition reduces the predictive probability of entry. This negative relationship is consistent with all the models included in this study. Thus, we do not find support for our hypothesis 1.

In model 2, we add a set of demographic and education controls. Consistent with previous literature, we find a U-shaped relationship between age and firm entry (Ucbasaran et al, 2008). The likelihood of entry increases until a certain age and then it declines. As for the other demographic and education variables, we can infer that foreign, male, and well-educated individuals are relatively more likely to transition into entrepreneurship than are other individuals. In terms of experience, we find that individuals with longer careers in paid

employment and non-employed are less likely to transition to entrepreneurship. In contrast, individuals with previous entrepreneurial experience are more likely to become entrepreneurs.

Our theory predicts that foreign competition leads to an increase in the entry of high qualified entrepreneurs. To evaluate that claim we interact the two educational variables (medium and high education) with our foreign competition measure and add these interactions to equation 2. The coefficient estimates are reported in Models 3 of Table 4. The interaction effect of foreign competition and medium education is positive and significant (β= 1.493, $p < 0.01$). This positive relationship also holds when we include the interaction of higher education and foreign competition (β= 0.851, $p < 0.10$). These results suggest that individuals with more education are more likely to enter into the market as foreign competition increases. Hypothesis 2 is thus supported.

Models 4 and 5 of Table 4 report the IV-probit estimates. These estimates are quite similar to probit estimates but larger in magnitude. The coefficient associated with our foreign competition measure becomes more negative (β=- 1.592) and the significance level changes from 5% to 1%. Also, the interaction of foreign competition and higher education becomes larger (β= 1.135) and the significance level changes from 10% to 5%. Note that we use a weighted average of China import share to the U.S as an instrument for foreign competition, and we find support for a positive correlation between those variables. For both specifications, the coefficients associated with the instrument in the reduced equation are positive and significant (β=0.102, $p < 0.01$) and the results are available upon request.

[INSERT TABLE 5 ABOUT HERE]

Table 5 presents the results for the quality of the initial workforce. Models 1 and 2 show the results for the share of high educated workers and models 3 and 4 presents the estimates for the

share of medium educated workers. We present both the OLS and IV model side by side; the results of both specifications are similar. The coefficient associated with foreign competition is positive and significant (β= 0.241, $p < 0.01$). The IV estimate is larger in magnitude and also significant (β= 0.438, $p < 0.01$). These results suggest that ventures established in regions facing higher foreign competition are more likely to hire highly educated workers. We also find a positive and significant effect of foreign competition on the share of medium educated workers (β= 0.197, $p < 0.10$), nevertheless the coefficient loses statistical significant in the IV regression (Model 4 of Table 5). These results are consistent with the predictions of Hypotheses 3 which suggest that foreign competition increases the quality of the initial team. As suggested by previous literature, we find that well-educated founders are more likely to hire similarly educated workers. The coefficients associated with high and medium education are positive and significant (β= 0.105, $p < 0.01$ and β=0.006, $p < 0.10$) for the share of high educated workers and (β= 0.155, $p < 0.01$ and β=0.083, $p < 0.01$ for the share of medium educated workers). However, founders' demographic characteristics do not statistically affect the share of high and medium educated workers. The only exception is founder's age for the share of medium educated workers. In this case, we find a U-shape relationship. Size has a negative association with the share of high and medium educated workers (β= -0.004, $p < 0.01$ and β= -0.013, $p < 0.01$), suggesting that larger ventures will hire less educated workers.

We have one additional analysis intended to inform us about the relative quality of the initial workforce. We repeat the analysis reported for education, but now we use as the dependent variable the logarithm of employees' monthly average income (in 2008 Euros). Unfortunately, for some of the workers, their salaries are not disclosed and consequently the sample size is smaller. Model 5 and 6 of Table 5 present the results for OLS and IV specification. The

coefficient associated with foreign competition is positive and significant (β= 0.98, $p < 0.01$), suggesting that ventures established in regions facing higher foreign competition pay higher salaries to their workers than other ventures. As noted previously, the IV coefficient is larger in magnitude (β= 1.188, $p < 0.01$). These results are consistent with the predictions of Hypotheses 3, using wages as a proxy for the quality of the workforce. Founder's education and industry experience have a positive association with the average income of the workforce (β= 0.065, $p < 0.01$; β= 0.136, $p < 0.01$ and β= 0.016, $p < 0.10$, respectively). The results suggest that founder's with high human capital pay larger salaries. The size of the venture positively affects the salary of the workforce (β= 0.039, $p < 0.01$), suggesting that larger ventures pay larger salaries.

Again, we use as instrument for foreign competition the weighted average of China import share to the U.S. All the coefficients associated with the instrument in the reduced equations are positive and significant (β=0.102, $p < 0.01$) and the results are available upon request.

Below we provide results related to additional robustness check we conducted. We did not include these tables due to concern about the length of the paper. The results are available upon request.

Supplementary Analysis I: Alternative Measures of Foreign Competition

In the earlier analysis, we use a weighted average of China import share as our foreign competition measure. This is by no means the only way to measure foreign competition. We computed alternative measures by changing the weights and the import share. First, we apportion imports according to counties share of total industry sales instead of apportioning according to share of employment. As another measure, we replace the China imports share, with the China net imports (imports - exports) share. Also, we consider import share with low-income countries (including China). These alternative measures yield similar estimates to the ones presented in the

section above. We also computed a measure of foreign competition considering the imports share

of high-income countries. In this latter case, we obtain similar results but smaller in magnitude.

For example, the coefficient of foreign competition on entry is β= -0.172 ($p < 0.01$) and the

interaction of the high education and foreign competition is not statically significant.

Supplementary Analysis II: Restricting the sample

As noted before our instrumental variables strategy seeks to isolate the supply shocks of

China imports increase. Nevertheless, our IV estimates might understate the true effects if the

demand shocks are correlated between Portugal and the US. To address this concern, in

untabulated results, we dropped industries where the rise of Chinese imports might be due to an

increase in domestic demand. We exclude the consumer electronics industry (mobile phones,

television, and computers) and we find that the foreign competition negatively affects firm entry

(β= -1.525, $p < 0.01$). The interaction of the medium education with the foreign competition

(β=1.576, $p < 0.01$) and the interaction of the high education with the foreign competition (β=

1.115, $p < 0.05$) are both positive and significant. In terms of the quality of the initial team, we

find a positive and significant effect of foreign competition on the share of high educated

workers (β= 0.389, $p < 0.01$),

Supplementary Analysis III: Using Lags

In the analyses reported above, we used the current level for our foreign competition

measure. For robustness checks, we allow a dynamic response by including lag lengths (1, 2 and

3-year lags) for the foreign competition measure. For entry, the coefficients on foreign

competition continue to be negative and statistical significant (β=-1.372, $p < 0.01$; β=-1.234, $p <$

0.01; β=-1.234, $p < 0.01$ for 1-, 2- and 3-year lag, respectively) and the interactions between

medium education and foreign competition continue to be positive and significant (β=1.316, $p <$ 0.01; β=1.219, $p < 0.01$; β=1.025, $p < 0.05$ for 1-, 2- and 3-year lag, respectively). The interactions between high education and foreign competition are positive but only statistically significant for 1-year lag (β=1.119, $p < 0.05$). In terms of the quality of the initial team, we find a positive and significant effect of foreign competition on the share of high educated workers (β= 0.411, $p < 0.01$; β= 0.465, $p < 0.01$; β= 0.470, $p < 0.01$ for 1-, 2- and 3-year lag, respectively).

Supplementary Analysis III: Size of Initial Team

We evaluate the quality of the initial workforce in terms of education and income. As an additional analysis, we evaluate the impact of foreign competition on the size of the initial team. We measure size as the logarithm of a total number of initial employees. We find a negative and significant effect of foreign competition in size (β= -1.030, $p < 0.05$). The IV estimate is larger in magnitude and also significant (β= -1.695, $p < 0.01$). These results suggest that ventures established in regions facing high foreign competition are likely to be smaller than other ventures.

DISCUSSION AND CONCLUSIONS

Increased globalization has increased relationship among countries. However, the debate regarding the impact of foreign competition on the economic activity of the host countries continues. To the best of our knowledge, this is the first empirical study that explicitly examines how foreign competition affects entrepreneurial activity.

We use a comprehensive dataset from Portugal for the period from 1994 to 2008 to analyze how China foreign competition affects new firm entry. Our results show that foreign competition reduces new firm entry, but with the availability of human capital has an opposite effect, fosters

firm entry. Our findings suggest that foreign competition may not always be a bad thing rather it can be a motivating factor for individuals with high human capital. We found that the interaction of foreign competition and human capital have a positive relationship with firm entry. Our findings have important implications for policy makers and domestic firms. For policy makers, our findings help them better understand how they need to be flexible in a changing environment and adopt policies that help to foster entrepreneurial activity.

We further argue that foreign competition influences the profiles of the initial workforce and our findings suggest that foreign competition spillovers help to create high-quality founding teams. In addition to the cognitive abilities, the individual entrepreneur also acts as 'a champion' to mobilize and combine resources to accomplish his/her goal. Therefore, as foreign competition creates opportunities for them to exploit, they would also push themselves to make the venture successful by creating a high-quality team. This high-quality founding team will employ strategies to acquire and channel resources to make the venture successful.

Theory suggests that trade yields aggregate gains. Our study highlights the dynamics of foreign competition spillovers. Foreign competition either forces to create or improves entrepreneurial ecosystems. In general, established firms tend to control or have overwhelming access to critical resources such as markets, high-quality human capital, and financial capital than nascent firms. Foreign competition can act as an 'external force' to break the existing structure and create opportunities for entrepreneurs who were either reluctant to enter the entrepreneurial activity or did not see an opportunity that they were willing to pursue. Foreign competition can also force policymakers to adopt policies that are more conducive to entrepreneurial activity.

Limitations and Future Studies

We examined the role of foreign competition in generating entrepreneurial activity and influencing the founding teams in Portugal. Whether our findings are generalizable to other countries remain to be seen because regulations, development level (Schwab & Sala-i-Martin, 2011), labor management and intellectual property are different (Hitt et al. 2005). Future studies may also explore how strategic alliances form due to foreign competition. Foreign firms may want to remain in the host country and be interested in increasing their market share in the host country. One possible way of increasing market share is by forming alliances with local firms. Another area of future exploration is international entrepreneurship/export related ventures.

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FIGURE 1
Hypothesized model
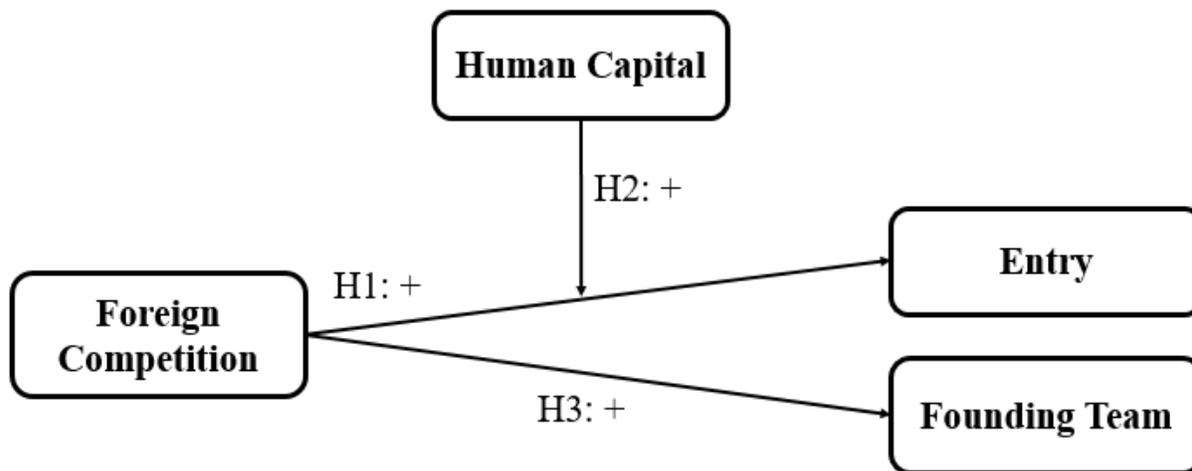
FIGURE 2
Portuguese Manufacturing Sector, 1986-2009
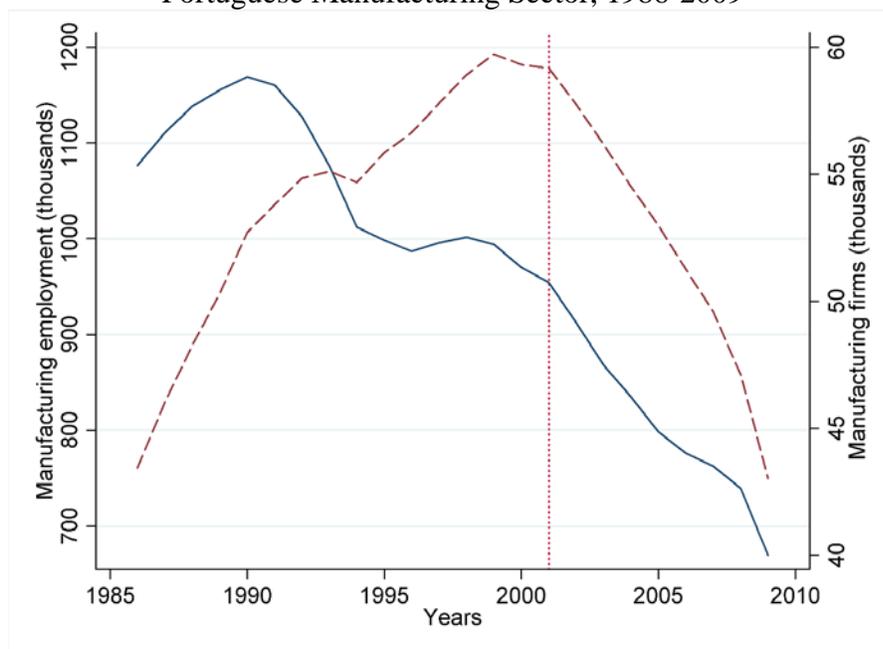
TABLE 1
Descriptive statistics for the individuals' database

Variables	All Sample			Workers			Entrepreneurs		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
Entry	1,214,502	0.03	0.17						
Gender (Male)	1,214,502	0.55	0.50	1,180,124	0.54	0.50	34,378	0.72	0.45
Age	1,214,502	31.81	10.77	1,180,124	31.59	10.71	34,378	39.31	10.08
Medium Education	1,214,502	0.13	0.33	1,180,124	0.13	0.33	34,378	0.14	0.35
High Education	1,214,502	0.05	0.23	1,180,124	0.05	0.22	34,378	0.07	0.25
Nationality (Foreign)	1,214,502	0.03	0.16	1,180,124	0.03	0.16	34,378	0.01	0.11
Non Employed	1,214,502	0.31	0.46	1,180,124	0.31	0.46	34,378	0.25	0.43
Tenure	1,214,502	4.91	3.81	1,180,124	4.89	3.80	34,378	5.70	3.97
Entrepreneurial Experience	1,214,502	0.05	0.21	1,180,124	0.02	0.15	34,378	0.83	0.37
Hourly income	1,103,847	3.90	3.76	1,098,220	3.89	3.76	5,627	4.63	4.59

TABLE 2
Descriptive statistics for the entrepreneurs' database

Variables	Obs.	Mean	Std. Dev.
Panel A - Firm Characteristics			
N Founders	7,068	1.47	0.69
Size	7,068	5.61	8.88
Survival	7,068	0.74	0.44
Panel B - Initial Team Members Characteristics			
Share of Medium Education	10,037	0.09	0.23
Share of High Education	10,037	0.02	0.10
Average Income	9,889	522.43	191.50
Panel C - Founder Characteristics			
Gender (Male)	10,037	0.71	0.45
Age	10,037	36.99	9.29
Medium Education	10,037	0.15	0.36
High Education	10,037	0.04	0.21
Nationality (Foreign)	10,037	0.01	0.08
Industry Experience	10,037	0.23	0.42

TABLE 3

Regional Average of Foreign Competition	Foreign Competition			
	China	CEEC	Other Low-Inc	High-Inc
	(1)	(2)	(3)	(4)
Panel A. Portugal				
1994	0.52%	0.15%	0.13%	2.72%
2000	0.71%	0.34%	0.11%	3.10%
2008	1.11%	0.61%	0.30%	2.35%
	0.59%	0.46%	0.17%	-0.37%
Panel B. US				
1994	2.92%			
2000	4.54%			
2008	8.68%			

TABLE 4
Results of Foreign Competition and Entry

	(1)	(2)	(3)	(4)	(5)
			Entry		
Foreign competition (FC)	-0.477*	-0.414	-0.804**	-1.174***	-1.592***
	(0.251)	(0.359)	(0.369)	(0.168)	(0.189)
Gender (Male)		0.113***	0.113***	0.112***	0.112***
		(0.008)	(0.008)	(0.008)	(0.008)
Age		0.065***	0.065***	0.065***	0.065***
		(0.002)	(0.002)	(0.002)	(0.002)
Age square		-0.077***	-0.077***	-0.077***	-0.077***
		(0.003)	(0.003)	(0.003)	(0.003)
Nationality (Foreign)		-0.197***	-0.195***	-0.195***	-0.193***
		(0.025)	(0.025)	(0.024)	(0.024)
Medium education		0.182***	0.135***	0.169***	0.119***
		(0.011)	(0.015)	(0.011)	(0.015)
High education		0.211***	0.183***	0.188***	0.151***
		(0.016)	(0.023)	(0.016)	(0.023)
Non-employment		-0.109***	-0.109***	-0.114***	-0.113***
		(0.011)	(0.011)	(0.011)	(0.011)
Tenure		-0.116***	-0.116***	-0.120***	-0.119***
		(0.006)	(0.006)	(0.006)	(0.006)
Entrepreneurial experience		2.496***	2.496***	2.503***	2.503***
		(0.008)	(0.008)	(0.008)	(0.008)
FC*Medium education			1.493***		1.618***
			(0.328)		(0.337)
FC*High education			0.851*		1.135**
			(0.456)		(0.461)
Constant	-1.862***	-3.647***	-3.640***	-3.605***	-3.597***
	(0.074)	(0.108)	(0.108)	(0.052)	(0.052)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Method	probit	probit	probit	IV probit	IV probit
Observations	1,213,210	1,213,210	1,213,210	1,213,243	1,213,243

Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

TABLE 5
Results of Foreign Competition and Initial Workforce

	Share of high educated workers		Share of medium educated workers		Income	
	(1)	(2)	(3)	(4)	(5)	(5)
Foreign competition (FC)	0.241***	0.438***	0.197*	0.208	0.980***	1.188***
	(0.068)	(0.110)	(0.106)	(0.153)	(0.183)	(0.211)
Gender (Male)	0.003	0.003	0.003	0.003	0.006	0.006
	(0.002)	(0.002)	(0.005)	(0.005)	(0.008)	(0.008)
Age	-0.000	-0.000	0.005***	0.005***	0.000	0.000
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)
Age square/100	0.001	0.001	-0.005**	-0.005**	0.002	0.002
	(0.001)	(0.001)	(0.002)	(0.002)	(0.004)	(0.004)
Nationality (Foreign)	0.004	0.004	0.021	0.021	-0.075	-0.076
	(0.021)	(0.021)	(0.033)	(0.033)	(0.098)	(0.097)
Medium education	0.007**	0.006*	0.155***	0.155***	0.065***	0.063***
	(0.003)	(0.003)	(0.011)	(0.011)	(0.011)	(0.011)
High education	0.106***	0.105***	0.083***	0.083***	0.136***	0.135***
	(0.015)	(0.015)	(0.016)	(0.016)	(0.022)	(0.022)
Industry experience	-0.002	-0.002	0.001	0.001	0.016*	0.016*
	(0.002)	(0.002)	(0.006)	(0.006)	(0.008)	(0.008)
Size	-0.004***	-0.004**	-0.013***	-0.013***	0.039***	0.039***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.005)	(0.005)
Constant	0.255**	0.020	0.020	-0.312***	6.384***	6.179***
	(0.121)	(0.034)	(0.105)	(0.049)	(0.099)	(0.092)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Method	OLS	IV	OLS	IV	OLS	IV
Observations	10,037	10,037	10,037	10,037	9,889	9,889
Adjusted R-squared	0.127	0.125	0.142	0.142	0.161	0.161

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Appendix A - Data and Construction of Variables

A.1. Matched Employer-Employee Database

The longitudinal employer-employee dataset, *Quadros de Pessoal* (QP) originates from a mandatory survey submitted annually in October by all firms with at least one employee, regardless of industry, size and legal form.

This database collects information on an average of 227,000 firms and two million individuals per year, covering virtually all employees and firms in the Portuguese private sector. The data do not include information on self-employed, unemployed and public servant individuals. This database is available annually from 1985 onward, however, we restrict our analysis to the period between 1993 and 2008.

The database contains three related sets of records: one at the firm level, other at the establishment level and the last one at the employee level. Employees, firms, and establishments are cross-referenced by a unique identifier. Each year, firms report their year of incorporation, location (*concelho* or county where the main office is located), main industry, the number of employees, the number of establishments, initial capital, ownership structure and sales. At the establishment level, firms report the number of employees, location, and main industry. At the individual level, the database contains information on gender, age, date of hire, education (number of years of education and field of education), occupation, labor status, working hours, and October's earnings. However, the employee records are unavailable for the year 2001 and include redundant data or data with frequent changes in gender and/or year of birth. We consider these observations to be errors, corresponding to individuals whose identification number was not inserted or wrongly identified by the respondent. We drop individuals whose gender and year birth change in more than 75% of the total number of observations.

With these data, we construct two databases: individuals and entrepreneurs databases. For the first database, we select all individuals with age between 19 and 59 who worked in manufacturing firms in mainland Portugal between the period of 1993 and 2007. To reduce the number of multiple observations per individual, we ensure that an individual only appears once in the data. Next, we identify their background history and analyze their employment status in the following year (1994 and 2008). Individuals can either continue working as paid employees, move to entrepreneurship or become non-employed. In total, we have a sample of 1,214,502 individuals, of whom 34,378 are entrepreneurs.

For the second database, we select all manufacturing start-ups established in mainland Portugal between 1994 and 2008 from QP. In a second step, we identify the founders and their background history. As in the previous database, we restrict data to founders between 20 and 60 years of age. Finally, for each start-up, we identify the initial workforce hired in the entry year. We exclude start-ups were the only employees are the founders. We ended up with 10,037 founders and 36,683 employees of 7,068 new firms.

We have adopted the following definitions:

Entrepreneurs are business owners with legally independent firms with at least one employee that are present in the firm's first year of activity. We exclude from the analysis self-employed individuals because they have a different fiscal treatment and are excluded from the matched employer-employee dataset. Individuals are identified as business owners through a labor status variable that distinguishes business owners from paid employees. Around 20% of the firms in our data do not have a founder. This happens because some firms do not correctly identify the business owners using the labor status variable.

Entry is computed as the minimum of the year of foundation reported in the database, the year that the firm first appeared in the database and the year of hire of the first employee. Using this procedure, we ensure that a firm is a new entrant and eliminate possible merger/acquisitions or changes of denomination or legal structure.

Start-ups are entrepreneurial ventures founded by entrepreneurs with and with no previous working experience.

Initial Team includes all individuals, excluding the founders, who are employed in the first year of activity of the start-up.

From the firm and employee databases, we construct the following variables:

Size is Start-up's initial number of employees. This measure is computed as the total number of individuals in the employee records in the entry year. We exclude the founding team.

Gender (Male) is a dummy variable equaling one for men and zero for women.

Age is coded in years in the database. We restrict the samples to individuals with age between 20 and 60 years.

Education is coded in years in the database. We measure education with two categorical variables: *High Education* is a dummy variable equalling one for founders with bachelors, masters or doctoral degrees; *Medium Education* is a dummy variable equalling one for individuals reporting a high school diploma or vocational school degree.

Nationality (Foreign) is dummy variable equaling 1 for foreign and 0 for Portuguese individuals. This variable is only available in the data after the year 2000. We complete any missing information in the years before 2000 by tracking the individual's nationality is the following years.

Tenure is the number of years an individual has worked in the last employer.

Industry Experience is coded one for entrepreneurs that previously worked in the same industry (four digit level) as that of their new ventures. Industry classification changed in 1994 and 2007, and there is no unequivocal relation between the old and new codes. To mitigate errors, we use all unique relations to translate old to new codes and, vice versa. Then, we compute the variable industry experience for the new and old codes and aggregate both results. Alternatively, we also

use an algorithm, which is based on how the majority of firms changed industry codes from 1994 to 1995 to translate old into new codes. For 2007, this problem is mitigated because the database provides information on the new and old industry classification.

Income is the monthly regular earnings which include the base salary, regular bonus, and other regular wage components. Regular earnings are expressed in 2008 Euros using the CPI index.

A summary of main variables is presented in Table A.1.

Table A.1 – Definition of the variables

Variable	Definition
Panel A – Start-up Characteristics	
N founders	Number of business owners in the founding year.
Size	Start-up's initial number of employees.
Survival	Dummy variable equaling 1 for start-ups that survive their first three years and 0 otherwise.
Panel B – Initial Team Member Characteristics	
Share of Medium Education	Percentage of workers with a high school diploma or vocational school degree in the total number of employees.
Share of High Education	Percentage of workers with a bachelor, masters or doctoral degrees in the total number of employees.
Average income	Average monthly regular earnings (in 2008 Euros) of the initial workforce
Panel B- Individual and Founder Characteristics	
Gender (Male)	Dummy variable equaling 1 for male and 0 for female entrepreneurs.
Age	Age of the founder in the entry year.
Age Squared/100	Age squared divided by 100.
Medium Education	Dummy variable equaling one for individuals reporting a high school diploma or vocational school degree, and 0 otherwise.
High Education	Dummy variable equaling 1 for individuals with bachelor, masters or doctoral degrees, and 0 otherwise.
Nationality (Foreign)	Dummy variable equaling 1 for foreign and 0 for Portuguese individuals.
Industry Experience	Dummy variable equaling 1 for founders that establish a venture in the same four digit industry, 0 otherwise.
Entrepreneurial Experience	Dummy variable equaling 1 for individuals that previously founded a venture, 0 otherwise.
Tenure	Number of years an individual has worked in the last employer

A.2. EUROSTAT Database on International Trade

Data on international trade are from the EUROSTAT (available
http://ec.europa.eu/eurostat/web/international-trade/data/database). This database includes
product level information on all bilateral imports and exports between European countries and
any country in the World available back to 1994. The trade statistics are broken down by eight-
digit Combined Nomenclature (CN) product level. The following indicators are available: gross
trade value (in million euros), unit value and gross volume. In this study, we select trade data
between Portugal and other countries.

In order to ensure consistency between the EUROSTAT database and the matched employer-
employee database, we use the crosswalk in Pierce and Schott (2009) and Autor, Dorn, and
Hanson (2011), which assigns 10-digit HS product code to four-digit US Standard Industrial
Classification (1987 SIC). Next, we match the four-digit SIC to the four-digit International
Standard Industrial Classification of All Economic Activities (ISIC Rev. 3), using the
international concordance table (available in
http://unstats.un.org/unsd/cr/registry/regdnld.asp?Lg=1). Details on our industry classification
are available on request.

We apply our conversation table between six-digit HS product code and four-digit ISIC
industries to all imports. Next, we aggregate imports across four export country groups: China;
other low-income countries; Central Eastern European Countries (CEEC); and other high-income
countries. CEEC include Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania,
Slovakia, and Slovenia. High-income countries include Australia, Austria, Belgium,
Luxembourg, Finland, Japan, New Zealand and Switzerland. The selection of low-income
countries follows the World Bank definition in 1993. We consider the following countries:
Afghanistan, Albania, Angola, Armenia, Azerbaijan, Bangladesh, Benin, Bhutan, Burkina Faso,
Burundi, Cambodia, Central African Republic, Chad, China, Comoros, Republic of the Congo,
Equatorial Guinea, Eritrea, Ethiopia, The Gambia, Georgia, Ghana, Guinea, Guinea-Bissau,
Guyana, Haiti, India, Kenya, Lao, Lesotho, Madagascar, Malawi, Maldives, Mali, Mauritania,
Moldova, Mozambique, Nepal, Niger, Pakistan, Rwanda, Saint Vincent and the Grenadines,
Samoa, Sao Tome and Principe, Sierra Leone, Somalia, Sri Lanka, Sudan, Togo, Uganda,
Vietnam, and Yemen. We did not include Burma because data on EUROSTAT was not
available.

A.3. COMTRADE Database on International Trade

To construct our instrumental variable, we use data from UN Comtrade Database
(comtrade.un.org/data/). This database includes product level information on all bilateral imports
and exports between any pair of countries in the World available back to 1994. The trade
statistics are broken down by six-digit Harmonized Standard (HS) product level.

We select the import data from China to the United States of America and from other countries
to the United States for the period between 1994 and 2008.

In order to ensure consistency between the Comtrade database and the matched employer-
employee database, we use the crosswalk in Pierce and Schott (2009) and Autor, Dorn, and
Hanson (2011), which assigns 6-digit HS product code to four-digit US Standard Industrial
Classification (1987 SIC). Next, we match the four-digit SIC to the four-digit International

Standard Industrial Classification of All Economic Activities (ISIC Rev. 3), using the international concordance table (available in http://unstats.un.org/unsd/cr/registry/regdnld.asp?Lg=1). Details on our industry classification are available on request.