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The Impact Of Fdi On Firm Survival And Employment: A Comparative Analysis For Turkey And Italy

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A COMPARATIVE ANALYSIS FOR TURKEY AND ITALY**

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Abstract

Italy and Turkey over the last decade entered a process of progressive increase in foreign direct investment (FDI) starting from very low levels. We explore whether and how Italian and Turkish firms survival rates were affected by the increased foreign presence and whether domestic firms have been able to gain positive externalities.

Using firm level data on Italian manufacturing industries over 2002-2009 and on Turkish industries over 1984-2001 and 2002-2009, we investigate the effects of FDI on domestic firms following the recent literature on the transmission of technological and pecuniary FDI externalities to domestic firms survival (Görg and Strobl, 2003; De Backer and Sleuwaegen, 2003; Burke, Görg and Hanley, 2008; Girma and Gong, 2008; Bandick, 2010; Wang, 2010; Kosovà, 2010). We explore how the presence of FAs affected domestic firms' survival and employment growth disentangling horizontal and vertical spillovers. We investigate these issues both for firms' survival and for employment growth by using respectively hazard models and GMM system estimates. We ask whether indigenous plants tend to have shorter lives (more deaths) due to competition of FDI affiliates operating in the same industry and whether there is evidence of technological/knowledge/pecuniary externalities on firms' survival stemming from the presence of foreign multinationals in the same sectors and in upstream and downstream industries acting as input suppliers and customers. We consider the heterogeneity of both MNEs and domestic firms (global engagement, firm and sector dimension, productivity, market concentration, R&D intensity), in line with the theoretical literature on heterogeneity (Helpman et al., 2004).

Our findings highlight the complex channel of transmission from FDI to firm survival and growth. Our results suggest heterogeneity in terms of impact of foreign investment across firms, periods and sectors in both countries. The positive evidence in favor of positive spillovers is not overwhelming. In the case of Italy, the survival of domestic firms is positively affected by the increased presence of

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foreign firms within the same industry, but this only occurs in low- and medium-low tech industries. Besides, only domestic firms that have smaller technology gap vis-à-vis foreign firms benefit from significant horizontal and vertical (upstream) spillovers on survival. From the system GMM growth estimates we find that foreign firms do not have higher growth rates than domestic firms and, in terms of FDI spillovers, there is evidence of a negative impact on domestic firms employment growth if the foreign firm share in the region employment increases (negative local spillovers), and also a negative impact for firms with a higher technology gap if the foreign firm share in the sector increases.

For Turkey, the regional share of foreign firms has a weak negative static impact on survival rates, and an increase in the share of foreign firms in a sector also has a negative impact on survival in the 2003-2009 period. The foreign share of users seems to have positive coefficients, i.e., domestic firms will be more likely to survive if users are foreign, but these results are statistically significant only if firm-specific effects are not controlled for in the 2003-2009 period. Moreover, in the 2003-2009 period there is some evidence of a negative effect on survival if downstream firms are foreign. Regarding firm growth, foreign suppliers and change in regional share of foreign firms have both a strong negative impact on domestic firms' growth rates, i.e., those firms supplied by upstream foreign firms, and those firm operating in regions with an increasing foreign presence experience lower growth rates. There is also a weak negative impact of sectoral foreign share on growth whereas a weak positive impact is observed for the change in sectoral foreign share.

These results do not support the broad conclusion that FDI have positive impact on firms' indigenous survival and growth dynamics. Conversely, our findings provide not a favorable picture in terms of the balance between displacement/competition versus spillover effects of FDI on domestic firms.

1. Introduction

The present paper synthesizes some of the research findings included in the technical Report for the Femise Research Project FEM 34-12, on "THE IMPACT OF FDI ON FIRM SURVIVAL AND EMPLOYMENT: A COMPARATIVE ANALYSIS FOR TURKEY AND ITALY", corresponding to Femise Research Program 2010-2011.²

Since the mid-1990s foreign direct investment (FDI) have become the main source of external finance for developing countries, with a share more than twice as large as the official development aid. In particular, the increase in FDI flows to emerging markets as a major vehicle of financial capital and technology transfer raised expectations about its potential contribution to the economic growth and development. Hence, many countries not only liberalized their markets, but also offered generous investment packages, such as tax holidays, import duty exemptions, or preferential loans to attract FDI. A set of effects attached to the attraction of FDI (more capital, technology and higher productivity, spillover effects to domestic firms, increased competition, elimination of less productive firms, encouragement to productivity improvement) may explain the reason why policy makers have tended to emphasize the potential benefit that FDI can bring to the host economy and have started to treat foreign investment even more favorably than investment by domestic firms (Görg and Greenaway, 2004).

There has been a voluminous literature on the direct and indirect effects of foreign multinationals on host economies. *Direct effects* stem from the superior characteristics of multinational firms compared to those of domestic ones: Affiliates of multinationals firms tend to be larger and more productive, internalize greater technological know-how and modern management practices and they attract skilled labor by paying wages higher than domestic firms (Doms and Jensen, 1998). In addition to these superior characteristics, the presence of affiliates of multinationals generates *indirect effects* on domestic firms through competition in the marketplace as well as *spillover effects* through pecuniary and knowledge externalities (Blomström and Kokko, 1998).

Most of the literature on the effects of FDI on local contexts has focused on the productivity spillovers of FDI (technological or pecuniary).³ Instead, in this paper, we analyze two other aspects of FDI impact on domestic firms' performance: the impact on survival and employment growth. Our paper is not the first of its kind. This approach has also been explored quite recently (Görg and Strobl, 2003)⁴. It has several advantages. First, it leads to a

² We thank the FEMISE association for financial support granted to CELPE (University of Salerno) under the FEM34-12 project "The impact of FDI on firm survival and employment: a comparative analysis for Turkey and Italy" (<http://www.femise.org/en/2013/05/recherches/fem34-12-rex/>), within the contract between the European Commission and the FEMISE association n. 2009/221-866. The authors owe special thanks to professor Adalgiso Amendola, scientific supervisor and referee of the project for CELPE, currently, Director of CELPE. We are also grateful to professor Marcello D'Amato, former CELPE Director, and to Antonia Gregorio, CELPE scientific secretary for their support over the entire duration of the project. We also thank the three anonymous referees nominated by Femise which provided very useful comments and suggestions.

³ See Gorg and Strobl (2001), Smarzynska Javorcik (2004), Blalock and Gertler (2008), and Schoors and van der Tol (2001)

⁴ See also De Backer and Sleuwaegen, 2003; Burke et al., 2008; Girma and Gong, 2008; Bandick, 2010; Wang, 2010; Kosovà, 2010.



better understanding of the spillover effects of FDI given that the presence of FDI may increase average productivity of domestic firms through two channels: forcing them to be more productive and eventually eliminating inefficient domestic firms by intensified competition; alternatively, inducing technology or pecuniary spillovers. Hence, a simple positive correlation between the presence of FDI and higher productivity of domestic firms, as found in some studies, does not necessarily imply the existence of spillovers from foreign to domestic firms. The evidence on FDI productivity spillovers might be overestimated if it overlooks the crucial issue of firm turnover, which shapes the competitive landscape of the economy, is linked to the persistence of jobs, has an important impact on welfare in the economy and is an important factor of fragility of the economy in many countries. The analysis of survival also allows us to measure the FDI impact on firm performance overcoming the input endogeneity and simultaneity problems typical of productivity estimations.

Hence, our report using firm level data on Italian and Turkish manufacturing industries investigates the dynamics of firm survival and growth and the spillover effects from foreign-owned to domestic firms. We analyse these effects of FDI on the survival and growth prospects of domestic firms by also disentangling horizontal and vertical spillovers. We use hazard models for the econometric analysis of firm survival and the system-GMM and Heckman selection models for the analysis of firm (employment) growth.

Italy and Turkey are two excellent case studies for analyzing to what extent FDI contributes to firm survival, a topic which is understudied with respect to other more investigated issues related to FDI. This topic is particularly neglected for Italy and Turkey and for the whole Mediterranean region. This research is therefore expected to fill a gap in the empirical literature on FDI. Italy and Turkey over the last years both entered a process of progressive increase in FDI starting from very low levels. Italy experienced fast rising increase in inward FDI, whose value passed from 6,918 million dollars in 1999 to 44,202 million dollars in 2007 (Unctad, 2012). Turkey provides a sort of textbook experiment of the impact of FDI in an emerging country having become after 2003 a very attractive acquisition target for foreign investment inward, whose value passed from 1,000 million dollars in 2003 to 44,000 million dollars in 2007. The countries under study are also affected by high firm mortality: taking firms entered in 2002, four years after their entry we observe that only 60 percent survived in Italy (Istat, 2010) and only 51 percent in Turkey (Turkstat, 2010). Our lines of research have relevant policy implications given that encouraging FDI and at the same time enterprise creation and persistence are cornerstones of most industrial policies.

Recent empirical work on productivity differences between firms shows that multinational enterprises (MNEs), regardless of whether they are domestic (DMNEs) or foreign-owned (FMNEs), exhibit a “productivity premium” compared to purely domestic firms (Crisuolo and Martin, 2009). This is in line with the literature on firm heterogeneity (Helpman et al., 2004) which shows that a firm’s status in terms of global engagement is crucially related to the firm’s performance. However, some studies show that after acquiring a firm, foreign firms tend to shut some plants and Acquisition entry has been found to have a 60 per cent shorter survival time than Greenfield entry (Girma and Gorg, 2003; Harris, 2009).

The two studies on Italian and Turkish firms use microeconomic analysis and are largely comparable as we estimate similar empirical models and we basically use the same variables for the two analyses. The key variables of interest are those related to FDI: the dummy for FDI, the output share of foreign firms in the same sector, to measure sectoral horizontal

spillovers, the output share of foreign firms in the region (a proxy for local spillovers), the relative growth of these variables to check for dynamic effects, the vertical spillover variables, such as foreign share among suppliers and foreign share among buyers, using as weights the technical coefficient derived by the national input/output tables. In order to purge out the effects on firms' survival due to the presence of FDI, we also control for several firm and industry factors which are known by the literature to be related to life duration. At firm level we include variables such as size, relative size, age, productivity, real wage, capital/labor ratio, export status, and some financial indicators such as the firm profit margin. At industry level, we control for market characteristics such as exposure to trade, entry rate, sectoral output growth rate, producer price index growth, competition of the market measured by the Herfindahl concentration index, minimum efficient scale, R&D intensity. In addition to this, for Turkey it was also possible to check for the share of subcontractors in inputs and for the share of output subcontracted to other firms and also to introduce a dummy for technology transfer.

For each country under analysis we focus on two set of questions: 1) the impact of FDI on firm survival; 2) foreign and domestic firm (employment) growth.

The presence of foreign establishments changes competitive conditions in the market and might hence reduce domestic establishments' survival probability. Foreign establishments are likely to intensify competition, and may force domestic establishments go out of the market (Caves, 1974; Blomström and Sjöholm, 1998). However, domestic firms may also benefit from technological and pecuniary spillovers from foreign establishments, and become more competitive in domestic and in international markets, although this is more likely to happen in the long run. In the end, if the spillover effect is dominant on the competition/displacement effect, then the survival probability of domestic firms will be enhanced by the presence of foreign firms. Therefore, **we ask whether indigenous plants tend to have shorter lives (more deaths) due to competition with FDI affiliates operating in the same industry and region and also whether there are technological/knowledge/pecuniary externalities on firms' survival** stemming from the presence of foreign multinationals in the same sector and region (**horizontal spillovers**) and in upstream and downstream industries as input suppliers and customers (**vertical spillovers**). Another question we investigate is **whether** the impact of FAs on **domestic firm survival rates varies with domestic firm technological gap with respect to foreign firms**. Hence, our analysis also provides **a test for the absorptive capacity hypothesis**, which has been investigated in the large literature on FDI spillovers on productivity (Findlay, 1978, Wang and Blomstrom, 1992; Glass and Saggi, 1998; Jordaan, 2008; Jabbour and Mucchielli, 2007 among the others). Furthermore, **we check for the level of technology of the sector**, another source of potential heterogeneity in firm behaviour (see Görg and Strobl, 2001 and 2003; Burke et al., 2008; Kosovà, 2010). To this purpose, we re-estimate our model by disaggregating manufacturing into two groupings: i) high and medium-high technology industries and ii) low and medium-low technology industries (OECD taxonomy). We explore these issues also for employment growth.

Some methodological issues

A special effort has been devoted to make the results for the two countries comparable by estimating similar empirical models. However, we were unable to avoid some data restrictions and discrepancies which explain the different empirical approach adopted in some cases.

First, the Turkish survey is totally exhaustive for establishments with 10 or more employees. All the Turkish firms have to answer the survey, so we have information about all firms after

1982, in particular firms created after 1982 and those who exited the market after 1982 above 10 employees. So in the Turkish case we have an unbalanced panel of more than 150,000 observations per year for the 1983-2001 period and of more than 18,000 observations for 2003-2009.

For Italy the dataset we use, a survey for 2002-2010, is stratified and randomly selected so to reflect sector's geographical and dimensional distribution of Italian firms with 11 to 500 employees.⁵ This dataset has several advantages: allows a long time span (2002-2010), let us identify the firms in the sample that were exporters over the period, contains many variables. However the sample is quite small compared to the Turkish dataset (we have 4,066 firms and an unbalanced sample of 32.131 observations). This creates some important limitations which need to be underlined: we cannot do separate estimates for domestic and foreign firms due to the limited number of observation; besides, as in this panel we do not have year by year entry we cannot focus on new firms.

Nevertheless these data limitations, we tried to follow similar estimations strategies as far as we are able to. Firm survival was measured in both case studies following hazard models and growth was estimated by GMM-system and Heckman models to eliminate potential simultaneity, endogeneity and selection biases.

The following report is organized as follows. Section 2 provides a **review of the literature both theoretical and empirical** on the potential impact of foreign presence on domestic and foreign firms' survival and employment. Section 3 focuses on the **Italian case**, providing data and basic **stylised facts about FDI in Italy (3.1.)**, and evidence on **horizontal and vertical impact of foreign affiliates on survival (3.2)**, and **on growth (3.3)**. Section 4 analyses the **same issues for Turkey** following the same organisation in subsections. Finally, section 5, compare the **main findings for Turkey and for Italy**, and section 6 **concludes**, providing some policy implications and generalization of the results to the whole South Mediterranean region.

2. Literature review

2.1. FDI effects on firm survival: a theoretical overview of key hypotheses

Recent empirical work on productivity differences between firms shows that MNEs, regardless of whether they are domestic or foreign-owned, exhibit a “productivity premium” compared to purely domestic firms (Crisuolo and Martin, 2009). This ties in with the literature on firm heterogeneity (Helpman *et al.*, 2004) which shows that a firm's status in terms of global engagement is crucially related to the firm's performance. In this context, affiliates of foreign multinationals should have a superior performance and being a vehicle for acceding to more advanced foreign technologies and, therefore for improving firm efficiency in the host country.

The impact of FDI on domestic firms is a widely investigated issue in the literature is. Multinational firms may have both *direct* and *indirect* effects on host economies. The direct effects are related to the fact that foreign multinationals enterprises are usually more productive than domestic-owned firms. Therefore, by attracting FMNEs a country can

⁵ For both Italy and Turkey the data used are not exhaustive for small firms.

increase its aggregate productivity by a pure *composition effect* (Doms and Jensen, B., 1998). However, foreign multinationals also have an indirect impact on domestic firms and this may be compounded of a competition effect and a spillover effect through pecuniary and knowledge externalities.⁶ However, the technological superiority of foreign firms, larger, more productive and more capital and skill intensive than their domestic counterparts, does not necessarily imply any productivity benefit spilling over to the host economy's firms.

The large and overwhelming strand of literature on the effect of FDI on local contexts has focused primarily on examining the spillovers effects on *firms productivity* (see Gorg and Strobl, 2001; Görg and Greenaway, 2004; Smarzynska Javorcik, 2004; Blalock and Gertler 2008; and Hanousek, Kočendab and Maurel, 2010, and Havranek and Irsovà, 2010, for a survey of this large literature). Within this framework, the empirical literature has identified three main channels through which FDI impact on domestic-owned plants: horizontal intra-industry economic linkages, vertical upstream and vertical downstream inter-industry linkages.⁷ Building on this research, recent empirical works (Görg and Strobl, 2003; De Backer and Sleuwaegen, 2003; Görg and Strobl, 2004b; Burke et al., 2008; Girma and Gong, 2008; Bandick, 2010; Wang, 2010; Kosovà 2010) have investigated the issue of the transmission of technological and pecuniary FDI externalities to *firms survival*.

There are two main advantages stemming from this new approach which deserve some consideration. Firstly, while the measurements of productivity spillovers entails the problem of input measurement, and therefore face the input endogeneity problem typical of productivity estimations, the estimation of firm exit largely avoids measurement problems.

More importantly, the research on FDI spillovers has neglected the possibility that domestic firms may exit as a result of foreign competition. Therefore, the positive evidence on productivity spillovers might be overestimated. The current literature on FDI only focuses on multinationals' and host countries' (static) characteristics neglecting the process of competition. However, the competition process is crucial for understanding the interactions between foreign and domestic firms, and, hence, the effects of FDI on the host economy. For example, the presence of FDI may increase average productivity of domestic firms by two channels: forcing them to be more productive and/or eliminating inefficient domestic firms by intensified competition; alternatively, through technology spillovers. Therefore, a simple positive correlation between the presence of FDI and higher productivity, as found in some studies, does not necessarily imply the existence of spillovers from foreign to domestic firms.

As discussed in Görg and Strobl (2003) the theoretical a priori are quite ambiguous. On the one hand, foreign establishments are likely to intensify competition and may force domestic establishments go out of the market. Multinationals may also have negative effects on firm survival via their higher output and wages. They would hence push up domestic firms average costs of production and produce a *selection/crowding out effect* as described in the prominent

⁶ The literature has mainly focused on testing the indirect impact of FDI due to the fact that estimating the direct effect is complicated by several issues as foreign firms and domestic firms are heterogeneous enterprises and contrasting the former with the latter entail building a counterfactual to avoid the selection bias due to the different size, productivity and performance of foreign and domestic firms.

⁷ Horizontal intra-industry linkages refer to the economic relationships between domestic- and foreign-controlled affiliates within the same industry, mainly through competition for market shares. Upstream inter-industry linkage is the economic relationships of a local firm with foreign firms in forward industries through purchasing intermediate inputs from them, downstream inter-industry linkage is the economic relationships of a local firm with foreign firms in backward industries through selling products to them.

work by Aitken and Harrison (1999).⁸ On the other hand, domestic firms may benefit from *spillovers*, of knowledge or pecuniary, from foreign establishments.⁹

Within this framework, the empirical literature has identified three main channels through which FDI impact on domestic-owned plants: horizontal intra-industry economic linkages between domestic- and foreign-controlled affiliates within the same industry, mainly through competition for market shares but also through imitation, demonstration and labour mobility (Bomstrom and Kokko, 1998); vertical upstream and vertical downstream inter-industry linkages, i.e. the economic relationships of a local firm with foreign firms in forward industries through purchasing intermediate inputs from them and linkages of local with foreign firms through selling products to them. A common assumption made in the literature is that there is a potential *technology gap* between domestic firms and MNEs (due to MNEs' firm-specific assets)¹⁰, and this creates the opportunity for transfer of more efficient technology and managerial practices from foreign to domestic firms.¹¹ However, theoretical arguments assess that intra-industry FDI effects are less likely as the diffusion of technology and know-how to their local competitors is not in the strategic interest of foreign affiliates, especially when the technological superiority of the foreign affiliates is the main element of their competitive advantage in the host market.¹² Conversely, spillovers from inter-industry linkages are much more likely. When FDI affiliates are customers of domestically-owned firms they will often provide technical assistance to them, in order to have a high-standard and stable stream of input suppliers. These, backward linkages with domestic suppliers may lead to vertical FDI *downstream spillovers* with increased productivity and lower prices in upstream industries (Blalock and Gertler, 2008). Furthermore, the linkages between local final-good producers and foreign suppliers, may also help the diffusion of the foreign technology through the local economy if foreign affiliates provide local firms with more variety and good quality inputs in upstream industries. These forward linkages might be an effective channel through which FDI may transfer technology to the host economy (vertical

⁸ These authors argue that foreign firms producing at lower marginal costs than indigenous firms have an incentive to increase output and attract demand away from indigenous firms. This will cause host country rivals to cut production which, if they face fixed costs of production, will raise their average cost and, therefore, reduce their probability of survival. A different competition effect is also described in the literature: multinationals, due to their advantages, may use foreign acquisitions in order to gain market access take over a rival and closing it down afterwards.

⁹ FDI knowledge and technology spillovers occur when the benefit from FDI are not completely captured by monetary transactions due to the public good nature of knowledge transmission. FDI pecuniary spillovers are instead fully captured by prices.

¹⁰ Multinationals are generally assumed to have some sort of firm specific asset or efficiency advantage that enables them to operate abroad successfully (Markusen, 2002; Helpman *et al.*, 2003).

¹¹ The channels of impact on firm survival in sectors that supply inputs to multinationals is described by Markusen and Venables (1999). According to this model, the presence of multinationals has three effects on the host economy. First, there is a negative *competition effect* as multinationals compete with domestic final good producers. The increase in total output due to multinationals production decreases the market price, *which leads to the exit of some domestic firms*. Hence, there is a *demand effect* as multinationals create additional demand for domestically produced intermediate goods through linkages with indigenous suppliers inducing the *entrance of new intermediate producers*. Then, a derived third effect takes place through a fall in the price of intermediates which induce the *entry of domestic final good producing firms*. The latter two positive effects may outweigh or not the potential negative competition effect. See also Rodriguez-Clare (1996) which sets up a theoretical model in which multinationals benefit a host country by expanding the set of intermediate inputs available there.

¹² Gorg and Greenaway (2004a) in their review of the literature on the impact of FDI on productivity conclude that the net effects of FDI are often found negative: competition effects generally dominate potential technology and pecuniary spillover as FDI affiliates try to safeguard their technology as tightly as possible. See also Castellani and Zanfei (2007).

FDI *upstream spillovers*). An increase in productivity through technology or pecuniary spillovers will reduce a host country firm's average cost of production, so increasing their price-cost-margins with a positive effect on firm survival (see e.g. Audretsch, 1991 and 1995). However, the intensity of linkages between foreign and domestic firms and the extent to which those linkages will generate technology transfers depends also on other crucial elements, particularly the technological capacity of domestic firms. The lack of absorptive capacity is another traditional explanation for the absence of the horizontal technology spillovers. Caves (1996) argues that the likelihood that MNEs will crowd out local firms is larger in developing than in developed countries because of a higher technology gap between domestic and foreign firms. The technology gap may also prevent inter-sectoral spillovers through vertical linkages. More precisely, if the technological gap between the foreign buyer and the domestic supplier is considerable, one can suppose that the foreign firm will be reticent to purchase specialized intermediates from domestic suppliers. Besides, in the presence of technology transfer the suppliers will not have the capacity to absorb this technology and to develop the intermediate goods. Similarly, if the gap between the domestic final-good producer and the foreign supplier is significant, the former will lack the capacity to absorb and to benefit from the foreign technology incorporated in the input. This view is supported by the technological-accumulation literature (see Cantwell 1989; Kokko 1994; Takii 2005; Dimelis 2005; Hamida and Gugler 2009). However, the theoretical and empirical literature on the relation between the level of technology gap and the absorptive capacity of firms is split. Findlay (1978), later on Wang and Blomstrom (1992), Blomstrom and Wolff (1994), and more recently Jordaan (2008) and Jabbour and Mucchielli (2007) find that the potential for positive spillovers is higher when the technology gap between domestic firms and MNEs is large. This argument is based on the idea that firms with lower stocks of technology have a greater scope for technological accumulation in that they have a larger stock of established knowledge to assimilate.

Finally, the technology of the sector to which the firm belongs to is also relevant. It has been argued that domestic firms in high tech sectors should be more likely to benefit from positive spillovers as they can be assumed to have relatively high levels of technology themselves and thus to have the necessary stock of knowledge which allows them to utilise spillovers from multinationals (Görg and Strobl 2003). However, this is not necessarily the case. In high tech sectors firms are generally more competitive, besides, MNEs have more incentives to prevent technology leakages to their competitors (Burke et al. 2008).

To sum up, we may conclude that the effect of MNCs on the survival of host country firms is ambiguous on a theoretical ground. The presence of foreign plants will change competitive conditions in the market. Foreign plants are likely to intensify competition, and may force domestic plants out of the market (Caves 1974; Blomström and Sjöholm 1999). This has, of course, efficiency-improving effects because the least efficient domestic plants tend to exit first. At the same time, domestic plants may benefit from spillovers from foreign firms, and become more competitive in domestic and, more importantly, in international markets. If the spillover effect is dominant, then the survival probability of domestic firms will be enhanced by the presence of foreign firms in the same market.

2.2. Previous studies on the potential impact of FDI on domestic firms' survival

The most investigated issue in the literature on the impact of FDI on host economies is the FDI spillover on firm productivity. The empirical evidence is quite extensive. Early case studies and industry-level findings (Caves, 1974; Blomström, 1986) emphasize that activities of MNEs generate knowledge externalities and several macroeconomic studies (Borensztein, Gregorio & Lee, 1998; Alvarez et al., 2004) provide supporting evidence. However, firm-level panel studies disaggregating by intra-sectoral and inter-sectoral spillovers generally find no clear-cut findings. Mixed evidence is generally found on intra-industry spillovers.¹³ On the contrary, studies on inter-industry FDI productivity effects suggest the presence of important and positive spillovers. They mainly focus on developing or transition economies and on the channel where domestic-owned firms provide inputs to downstream FDI affiliates (downstream inter-industry linkages).¹⁴ Referred to developed countries, both upstream and downstream economic linkages between FDI affiliates and domestic-owned plants are found to be important channels.¹⁵

The empirical evidence on the effect of inward FDI on survival of domestic entrants and/or incumbents firms is quite limited (see the synoptic view of this literature in Tab. 2.3.1.). The majority of studies focus on intra-industry spillovers. De Backer and Sleuwaegen (2003) analyze firm entry and exit across Belgian manufacturing industries and find evidence that foreign direct investment discourage entry and stimulate exit of domestic entrepreneurs.¹⁶ However, the crowding out effect is moderated or even reversed in the long-run as a result of learning, demonstration, networking and linkages effects. Görg and Strobl (2003 and 2004) distinguish between the impact of foreign MNEs on Irish-owned (indigenous) firms and on foreign-owned ones (i.e., other FMNEs) located in the host country confirming positive spillover effects rather than competition/crowding out. However, this only holds for plants in high tech industries.¹⁷ Alvarez and Görg's (2009) findings suggest that the presence of foreign firms has no effect on plant survival in Chilean manufacturing, after controlling for productivity. Burke et al. (2008) using U.K. single-plant firms document a negative effect of foreign presence on survival of firms in dynamic industries, alongside a net positive effect in

¹³ Several studies find that FDI generates positive spillovers on the productivity of domestic-owned firms—Chuang and Lin (1999) for Taiwan, and Branstetter (2005) and Keller and Yeaple (2009) for the US, among others. But others find significant and negative effects of FDI on local firms' productivity, see Haddad and Harrison (1993) for Morocco, Aitken and Harrison (1999) in the case of Venezuela. Studies in transitional economies also show negative FDI spillovers in the Czech Republic and in Bulgaria and Romania (Djankov and Hoekman, 2000; Kinoshita, 2000; Sabirianova et al., 2005,) and no spillovers in Poland (Konings, 2001).

¹⁴ At the firm level, the seminal paper by Javorcik (2004) finds substantial FDI spillover effects to Lithuanian-owned firms through these economic linkages (termed backward linkages). Similar findings are in Bwalya (2006) for Zambia, Blalock and Gertler (2008) for Indonesia, Marcin (2008) for Poland, Javorcik and Spatareanu (2008) for Romania and Jordaan (2008) for Mexico.

¹⁵ Lileeva (2010) find significant FDI spillover effects on Canadian-owned manufacturing plants as input suppliers. Jabbour and Mucchielli (2007) find positive and significant FDI spillovers through both forward and backward inter-industry linkages in Spain but conditioned on a certain level of absorptive capacity, and so is Wang (2010) which studies the productivity effects of FDI for Canadian manufacturing industries.

¹⁶ These results are in line with theoretical occupational choice models in open economy (Grossman, 1994), that predict foreign direct investment would crowd out domestic entrepreneurs through their selections in product and labour markets.

¹⁷ The presence of foreign firms will change competitive conditions not only for domestic establishments but for other foreign establishments as well. It is suggested that a foreign presence may generate positive information externalities for foreign entrants. Görg and Strobl (2003a) found that a foreign presence has no effect on foreign firms' survival in high technology sectors, but it has a positive impact in low technology sectors in Irish manufacturing. Thus, the empirical evidence indicates that foreign presence in an industry may enhance other foreign establishments' survival probabilities.

static industries.¹⁸ Bandick (2010) investigates how survival of domestic plants is determined by the presence of foreign ownership disentangling between domestic MNEs, export active plants and purely domestic oriented plants. The results reveal that foreign presence has negative effects on the survival of purely domestic firms while does not impact on the exit rate of Swedish MNEs and Swedish non multinationals exporting plants. Kosová (2010) using 1994–2001 firm-level data for Czech R. find evidence of technology spillovers and underline that crowding out is only a short term phenomenon. However, domestic firms in technologically advanced industries are the main beneficiaries of technology spillovers in the Czech Republic.

Two recent studies extend upon this literature differentiating the effects of FDI on domestic plants' survival across three channels of linkages: intra-industry, upstream, downstream. Girma and Gong (2008) using Chinese state-owned enterprises (SOEs) data find that intrasectoral competition from sectoral FDI has a deleterious impact on growth and survival probability of SOEs due to low absorptive capacity, export-oriented FDI in downstream sectors also have negative spillovers on performance while there are no discernible spillover effects that can be attributed to FDI in upstream sectors. Wang (2010) examines Canadian indigenous plants' survival though their economic linkages with FDI. The study finds that indigenous plants tend to have shorter lives due to competition with FDI affiliates operating in the same industry, but they benefit from FDI affiliates operating both in upstream and downstream industries as input suppliers and customers. The positive benefits of FDI outweigh the negative competition effects, resulting in a net positive impact on survival.¹⁹

Tab. 2.3.1.

3. The Italian case

3.1. Stylised facts about FDI in Italy

Although relative to the size of its market and to the EU average Italy still attracts astonishingly little FDI, the country experienced an increasing penetration of foreign firms since 1990. Over the decade before the 2008 crisis Italy's inward FDI value increased substantially passing from 6,918 million dollars in 1999 to almost 15 thousands million dollars in 2000, doubled in the following decade reaching up to 44,202 million dollars in 2007. After the serious drop in 2008 recovered at 30,000 million dollars in 2011 (Unctad, 2012) (see Fig. 3.1.1).

¹⁸ The explanation the authors provide for this result is that dynamic markets are typically characterised by high rates of churn (firm entry plus exit relative to the stock of firms) as they are at earlier stages of the diffusion of innovation. In these types of markets, new ventures are often innovative and tend to introduce new technology (Audretsch and Mahomood 1995, Geroski, 1995). By contrast lower churn (more static) industries are associated with later stages of innovation diffusion where price competition become more prevalent. In dynamic industries the relationship between them is more likely to be competitive hence, has a greater chance of being negative for survival. By contrast, in static industries new ventures are more imitative and hence have more scope to benefit from knowledge spillovers from foreign firms.

¹⁹ Ayyagari, M. Kosová, R. (2010) also investigate the role of horizontal and vertical spillovers in the Czech Republic during 1994–2000 on firm entry. They find that larger foreign presence stimulates the entry of domestic firms within the same industry, indicating the existence of positive horizontal spillovers from FDI. Their results also show that entry spillovers through vertical linkages are stronger than horizontal spillovers and that while service industries benefit from both horizontal and vertical spillovers, manufacturing industries do not experience significant positive entry spillovers at all.

Given that this project is about the FDI inflows to Turkey and Italy, it is relevant to compare the two countries' FDI performance. The comparison reveals some similarities over the long-term inward FDI inflows (See Figure 3.1.1). In the 1990s FDI inflows in Turkey and Italy were quite low. Given that Italy has quite high outward FDI flows in the 1980s and 1990s, having rather low inflows differentiates Italy from other EU countries. In the case of Italy, the upward trend in inward FDI flows started in 2000. In the case of Turkey, the upward trend in inward FDI flows started in 2000, and continued all the way up to \$44 billion in 2007.

In the case of Turkey, FDI inflows to the country increased significantly after the EU Council decision of December 2004 that approved the initiation of membership negotiations with Turkey. The similarity of the two countries in terms of inward FDI flows ended in 2008, the year of global financial crisis. Inward FDI flows to Italy plunged in 2008. Actually, it turns out that foreign investors started to leave the country, bringing the total inward FDI flows to a negative \$10 billion. Unlike Italy, FDI inflows to Turkey did not decrease in 2008. The decline came a year later when the FDI inflows dropped to \$8.4 billion in 2009. After the plunge in 2008, FDI inflows to Italy recovered in 2009 and reached \$20 billion. After a decline in 2010 to \$10 billion in 2010, it went up to reach \$30 billion in 2011.

Fig. 3.1.1.

Fig. 3.1.2.

In 2007, the number of foreign-controlled firms in Italy amounted at 14,401 (from 11,396 in 2001) with 1,246,794 workers employed (they were 1,003,693 in 2001) and a substantially higher added value (86,401 million dollars from 64,931 in 2001) and investment amount (16,132 from 12,566) (see Tab. 3.1.1.). Although less than 1 per cent of the population of firms in Italy are foreign owned, foreign multinationals accounted for about 13 per cent of net value added, 16 per cent of sales and 27 per cent of R&D in 2007 (see Fig. 3.1.3.) (ISTAT, 2010). The share of foreign firms in investment is considerably higher than the employment share because foreign firms tend to use more capital-intensive technologies.

Tab. 3.1.1.

Fig. 3.1.3.

From a sectoral perspective, the lion's share of investment is directed to manufacturing, which alone accounted in 2009 for almost 40 percent of foreign firms, 35 per cent of total turnover of foreign firms and 60 per cent of employment. Specifically, the number of foreign firms in the manufacturing sector was 3,301 (with 466,698 workers employed). Retail, wholesale trade and the service sector showed a remarkable dynamism too in recent years. FDI patterns in these sectors reflect change in the national privatisation strategies.

Most FDI inflows took the form of take over, first of public firms (privatizations) as privatization of public assets has attracted substantial FDI after 2002, and then of private domestic enterprises. As a result of these take-overs, the number of foreign affiliates among the largest firms has increased significantly, often contributing to the diversification of the economy and the development of a more dynamic service sector. Services such as

telecommunications, electricity, water and banks accounted for a large share of FDI inflows after 2000. *Greenfield investment*, according to the *World Investment Report*, were only around 40 per cent of total FDI over 2008-2010 (UNCTAD, 2011).

Italy is still lagging behind most EU countries in terms of FDI attraction and FDI performances are still far from potential (UNCTAD, 2011). This is also clear if we look at the Figure 3.1.4. This is the graph OECD prepares every year where it plots the FDI stock/GDP ratio with the regulatory restrictiveness of the economic environment. There is a negative association between the two: countries that have more restrictive regulatory environment tend to attract lower amounts of FDI inflows and end up having lower stocks of inward FDI relative to GDP. Italy is one of the outliers to this relationship: even though it has a low regulatory restrictiveness index (0.05), its inward FDI stock/GDP ratio is just 0.15, much lower than 0.42, the ratio that is implied by the estimated relationship.

Fig. 3.1.4.

In 2007 the inward FDI flows to Italy represented just 1.4% of total investment in OECD countries, of which only 3.5% was directed to Southern regions. In the same year the total FDI flows directed to Germany, France and Spain were 7.9%, 6.8% and 3.2% respectively (Eurostat, 2009).

It should be noted that investing in Italy has always been met with mistrust and that the Italian ruling system has always been considered unsatisfactory. The reasons are many and varied: the inefficiency of Italian bureaucracy; the exponential increase in legislation (“regulatory inflation”); the proliferation of actors entrusted with legislative powers and the ensuing overlapping of different tiers of regulation; excessively lengthy and complicated bureaucratic compliance procedures (“compliance costs”); and, finally, the several inefficient aspects of the administrative justice system. These factors have always been a “barrier” to FDI inflows to Italy (Scuola Superiore della Pubblica Amministrazione, 2008). De Santis and Vicarelli (2001) empirically analyse Italy’s performance in terms of FDI attraction. They conclude that Italy, compared to international competitors, has a specific disadvantage caused by high taxes on labour, high bureaucracy costs and low R&D investment. A similar analysis of Italy’s institutional disadvantage was carried out by Basile et al. (2005) to explain the “doom” of (Southern) Italian regions. The findings show that it is mainly attributable to the inefficiency of their bureaucracy and legal systems.²⁰

In addition to the weak institutional and business environment, the economic structure of the country (e.g. the pattern of specialisation, the very low R&D activity, the large presence of micro and small firms, the high incidence of firm mortality, the social-economic dualism between the more advanced North and the less industrialised South of the Peninsula,) have played a key role on foreign investors strategies.

²⁰ On the policy-making side, Sviluppo Italia, renamed INVITALY in 2012, is the Italian national agency in charge of FDI attraction. The National Agency mainly carried out advertising for the potential locations for FDI in Italy more than promoting an effective FDI promotion policy.

3.2. The impact of FAs on domestic firms' survival: intersectoral and intra-sectoral spillover effects

We ask the question: **how does the presence of FAs affects domestic firms' survival?** More specifically, we investigate upon the following issues: Do indigenous plants tend to have shorter lives (more deaths) due to **competition with FDI affiliates?** What is **the role of spillovers (knowledge and pecuniary) stemming from the presence of foreign multinational enterprises (MNEs)?** Are firms **benefiting from FDI affiliates operating in upstream and downstream industries as input suppliers and customers?** To answer these questions we disentangle between **intra- and inter-industry economic linkages**. Hence, we explicitly differentiate the economic linkages between FDI affiliates and domestic-owned plants as competitors, input suppliers, and customers.

We further investigate the same questions checking how **the impact of FAs on domestic firm survival rates varies with the technological intensity of production at the sectoral level** and how **relevant is firm absorptive capacity**. Regarding these topics, we test the findings of Audretsch (1991; 1995), namely, that in a market environment shaped by the process of creative destruction, the major factor determining the firm's survival likelihood is its ability to innovate. Previous studies have underlined that the net effect of foreign firms on domestic establishments' survival crucially depends on the host country's policy environment, and the technological capacity of domestic firms. Görg and Strobl (2001 and 2004) confirm that the larger the foreign presence in an industry, the higher are domestic establishments' probabilities of survival for plants in high tech industries but not in low tech ones, which suggests that firms in low tech industries have not enough *absorptive capacity* to profit of the *spillovers* from *technological gap*. Conversely, according to Burke et al. (2008), as both domestic and foreign firms are likely to be engaging in innovation in dynamic industries, and differences in innovation represent the focal point for competition in such industries, then foreign ownership is more likely to lower the firm survival rate in dynamic industries, while in static industries firms are more imitative and hence have more scope to benefit from knowledge spillovers from foreign firms.

These research questions will be investigated in detail using an unconditional analysis of survival and then turning to a conditional analysis based on the Cox proportional hazard model (CPHM), in which we look for the impact of several FDI related variables on firm survival controlling for several covariates both at firm and industry level, which may affect survival.

The analysis is organised as follows. Section 3.3.1 describes the dataset, while the variables specifications, the theoretical *a priori* with respect to the signs and some descriptive statistics are in section 3.3.2. Section 3.3.3 presents the model used and the estimation results. Some conclusions follow.

3.2.1. Dataset construction

The empirical analysis has been conducted using a firm level database for the period 2002-2010 resulting from the intersection of three different sources: IXth Survey on Manufacturing

Firms, by Capitalia, AIDA (Analisi Informatizzata delle Aziende) and Mint-Italy, both by Bureau Van Dyck. For a detailed description of the dataset see section A.I. in Appendix A.

3.2.2. Variables specification

In this section we describe the specification and the expected sign for the set of variables which we use in our empirical analysis distinguishing between industry level and firm level covariates (a full list is provided in table 3.3.1.).

Industry level covariates

We use three explanatory variables at industry level adopted in our previous econometric analysis of foreign ownership and firm survival (see Tab. 3.2.4): output growth,²¹ mes,²² herf.²³

We further add some FDI related variables to analyse in detail the impact of FDI:

- $FDI_OWN_INDUSTRY_{j,t} = Y_{j,t}^{FOR} / Y_{j,t}^{Total}$ where $Y_{j,t}^{FOR}$ is foreign firms turnover and $Y_{j,t}^{Total}$ is turnover of all firms in sector j at time t .²⁴ It is a measure of the importance of foreign presence in the host industry in the same firm's sector.²⁵ A positive coefficient reflects the presence of technology spillovers through demonstration effects, labour turnover or competition.
- $FDI_UP_{i \in j,t} = \sum_{k \neq j} FDI_OWN_INDUSTRY_{k,t} \times \frac{USE_{k,t}^j}{\sum USE_{k,t}^j}$ is constructed as a weighted average of $FDI_OWN_INDUSTRY$ in all upstream industries k of industry j , where the weights are input-shares²⁶ that industry j purchases from all its upstream

²¹ ISTAT data. The growth rate of sectoral output is an indicator for current market. Therefore, it is expected to have a negative impact on exit.

²² The variable will have a negative coefficient if new firms can find niches for themselves in markets where large firms operate (high MES), but find it difficult to compete in markets dominated by similar, small firms (low MES).

²³ This is the Herfindhal-Hirschman index of concentration constructed as the sum of squares of the market shares of all firms in the market i.e. $\sum_{i=1}^N \left[\frac{sales_{ijt}}{sales_{jt}} \right]^2$ and bound between 0 and 1. The value of the index is equal to one if there is monopoly in the market and will approach zero if the market is perfectly competitive. The index is used as a proxy for the level of concentration and thus of competition within the sector and year. If the higher levels of concentration in the market make survival more difficult (the competitive pressure argument), we may expect a negative effect of the level of concentration on survival. However, if the oligopolistic firms raise the product price above the competitive level, new firms could find more opportunities to survive in highly concentrated markets. Therefore, the effect of concentration on survival could be ambiguous.

²⁴ Source: Eurostat, <http://appsso.eurostat.ec.europa.eu/nui/setupModifyTableLayout.do>

²⁵ For sectoral classification we use 2 digit Ateco 2002.

²⁶ Source: Istat, input-output Tables. The information on the proportion of sector j 's inputs purchased from upstream sectors k ($\sum_{k \neq j} \frac{USE_{k,t}^j}{\sum USE_{k,t}^j}$) is available for 2 digit sectors and for 1995, 2000 and 2005, Ateco91 classification. We used the coefficients related to 2005.

industries (including non-manufacturing industries).²⁷ It is a measure of FDI in upstream industries k which affect firm i in industry j through providing intermediate inputs to industry j (see Langer and Taymaz, 2006 and Wang, 2010).²⁸

- $FDI_DOWN_{i \in j, t} = \sum_{k \neq j} FDI_OWN_INDUSTRY_{k, t} \times \frac{BUY_{j, t}^k}{\sum BUY_{j, t}^k}$ is constructed as a weighted average of $FDI_OWN_INDUSTRY$ in all downstream industries of industry k , where the weights are output-shares that industry j sell to all of its downstream industries k (including non-manufacturing industries).²⁹ It is a measure of FDI in downstream industries affecting firm i in industry j , through foreign firms purchasing inputs produced by firm i .
- $FDI_SHARE_REGION_{i \in r, t} = Y_{r, t}^{FOR} / Y_{r, t}^{Totali}$ where $Y_{k, t}^{FOR}$ is the production of foreign firms in region r at time t and $Y_{r, t}^{Totali}$ is the production of all firms in region r at time t . It is a measure of the importance of FDI in the region in which the firm is located.³⁰
- $HIGH_FOREIGN$, a dummy for firms belonging to sectors with low or high foreign presence and is equal to 1 if the percentage of foreign multinationals turnover over total turnover in the industry exceeds the 50th percentile, 0 otherwise.

We also expand our set of industry variables with the following ones:

- $IMP SHARE$, the ratio of 3 digit Ateco 2007 industry j 's total imports over its output at year t (Istat data). Imports could spur technology spillover effects, as often found in the trade literature³¹, and the spillover effects can lead to higher productivity and thus higher survival rates.
- $EXP SHARE$, the ratio of 3 digit Ateco 2007 industry j 's total exports over its output at year t .³² Exporting to foreign markets not only allows firms to access foreign knowledge, but also to gain an expanded customer base. Accordingly, these industries are expected to

²⁷ The formula excludes inputs supplied within each sector since they are already captured through the variable $FDI_OWN_INDUSTRY$. Besides, the input/output coefficients are calculated excluding products supplied for final consumption and imports of intermediate goods in order to consider only domestically sourced inputs.

²⁸ The amount purchased from foreign-owned firms or sold to foreign-owned firms for each industry is inferred from the industry input-output tables. This is common practice in literature given that it is generally unknown how much each firm (plant) sold to foreign-owned buyers or purchased from foreign suppliers. Implicit in the construction of Upstream and Downstream FDI is also the assumption that the interindustry input-output shares for each plant/firm in an industry are identical, and are the same as the one at the industry level. Blalock and Gertler (2008) argue that this measure, although not perfect, also avoids certain endogeneity problems regarding domestic firms' decision to supply foreign firms and to adopt the more advanced foreign technology into their production process.

²⁹ Source: Istat, Input-Output tables. The information on the proportion of sector j 's output used by k downstream sectors ($\sum_{k \neq j} \frac{BUY_{j, t}^k}{\sum BUY_{j, t}^k}$) is available for 2 digit sectors and for 1995, 2000 and 2005, Ateco91 classification. We used the coefficients related to 2005.

³⁰ Region is defined by NUTS2-level regions (Eurostat).

³¹ Imports are found to be an important channel for productivity growth (Frankel and Romer, 1999). Grossman and Helpman (1991) argue that imports embed the technology level of the producing countries, and a country can get access to other countries' technology through imports. Coe and Helpman (1995) find that imports promote technology diffusion among OECD countries. That finding is confirmed by later studies using data on OECD or developing countries, such as Keller (2002), Schiff and Wang (2006) and Schiff and Wang (2008).

³² ISTAT data.

generate some positive effects on firm survival. Exports are also argued to improve productivity performance of the domestic economy (Falvey et al, 2004).

- *ENTRY RATE*, the ratio between the number of firms which enter the business registry each year and the total number of active firms operating in industry j at year $t-1$.³³ Entry rate captures the dynamics of an industry. High levels of entry are associated with conditions that make entry less costly. *Ceteris paribus*, industries with higher entry rates should experience higher level of competition, and higher rates of churning, and thus higher exit rates.
- *TECH*, the technology macrosector dummies ($tech_class=1$ and 2) for firms belonging to low, medium-low, medium high and high technology (OECD taxonomy).³⁴ Previous work examining survival conditions of new entrants at the industry level (Audretsch and Mahmood, 1995; Audretsch *et al.*, 2000) have found exit rates to be greater in R&D intensive industries given that the competition environment is tougher.

Firm level covariates

Here we use a set of standard covariates also adopted in the previous estimates (see Tab. 3.2.4): size, age³⁵, productivity³⁶, capintensity, wage, outfdi, inwfdi, r&d, profit margin.

We also add the following variables:

- *RELSIZE*, defined as the log ratio between firm employment and the mean employment per firm in 2 digit Ateco sectors.

$$relsize_{ijt} = \log(E_{it}/S_{jt}) = \log(E_{ijt}) - \log(S_{jt})$$

where E_{ijt} is the number of employees in firm i operating in sector j at time t , $\log(S_{jt}) = \sum_{i \in j} \log(E_{ijt})/N_{jt}$, and N_{jt} the number of firms in sector j at time t .

We used the size variable relative to the sector average to take into account differences between average firm size across sectors. However, as the results between absolute firm size and relative size do not differ much in the estimate we only use the former variable.

- *EXPORT*, the export dummy variable that takes a value of 1 if firm i is an exporter and 0 otherwise;

As our data do provide us with detailed information on firm's financing requirements we also added some firm level financial variables: solvency ratio, short term and long term debts with

³³ ISTAT data.

³⁴ The classification of sectors by technology is based on an OECD classification as used by Keans and Ruane (2001). We aggregated the OECD's medium and high-sectors. For a detailed list of these sectors along with their ATECO codes, see tab. 9.

³⁵ Since older firms are more likely to possess a bundle of characteristics that have helped them to prevent exit in the past, we expect they have a lower chance to exit. This is coherent with noisy selection models (Jovanovic, 1982; Hopenhayn, 1992), where firms go through a process of learning about their relative efficiency and market competitiveness, and in line with a large number of empirical papers which have shown that younger firms are more likely to fail (e.g., Mata and Portugal, 1994; Audretsch and Mahmood, 1995; Disney *et al.*, 2003).

³⁶ Several theoretical models describing the dynamics of industries with heterogeneous firms (Jovanovic, 1982; Hopenhayn, 1992) predict that the exit of firms is motivated to a large extent by productivity differences at the firm level. Hence, we expect that the exit rates are lower for more productive firms.

banks over turnover and collateral ratio, given by the ratio of tangible assets to total assets, like in Guariglia and Bridges (2007).³⁷

- *SOLVENCY*, the solvency ratio (shareholder's funds/total assets), which is an indicator of the liquid assets of the firm. We expect to find that more solvent firms face a lower likelihood of failure. Low solvency indicates the need to raise funds due to low shareholder's equity (Mateut *et al.* 2006). As less liquid firms show greater demand for external funds compared to more liquid firms which have substantial internal sources, we expect to find that more solvent firms face a lower likelihood of failure
- *COLLATERAL*, given by the ratio of firm tangible assets to its total assets, is expected to have an important impact in terms of lowering failure probabilities.
- *DEBT WITH BANKS OVER TURNOVER*, which can be associated with a worse balance sheet situation, increasing moral hazard and adverse selection problems. Hence, we should expect a positive relationship between higher leverage and the probability of exit as some empirical studies have found (Becchetti and Trovato, 2002; Bunn and Redwood, 2003; Fotopoulos and Louri, 2000; Vartia, 2004; Bridges and Guariglia, 2008). On the other hand, as a high rate of leverage can also be seen as an indicator of a good credit standing and high borrowing capacity of firms, we expect an ambiguous sign between leverage and the exit probability.

We finally built two measures of firm *absorptive capacity*:

- *GAP*, the difference between the mean productivity of foreign firms in the sector and the productivity of each firm in the same sector and is used as a proxy for domestic technological gap (see Jabbour and Mucchielli, 2007).³⁸ Higher positive value of this variable indicates higher technology distance between domestic and foreign firms. We have ambiguous expectations on this variable since the literature on the relation between the level of technology gap and the firm absorptive capacity is split among two opposite views (see details in footnote 12).
- *GAP_CLASS*, the dummies for two technology gap classes: *gap_1*=low technology gap firms; *gap_2* =high technology gap firms; low tech gap and the high tech gap classes respectively contain firms below and above the 50th percentile.

In table 3.2.2. we describe the mean characteristics of firms with respect to all the variables listed above for the whole sample and disaggregating according to different types of global engagement (exporting, non exporting, being foreign multinationals, domestic multinationals, purely domestic firms). We observe several superior characteristics of globally engaged firms with respect to domestic non exporting firms but particularly it is worth underlining that foreign firms outperform national firms, even domestic multinationals, in productivity levels and in many other dimensions (higher size, age, productivity and profit margin, lower

³⁷ We also tried further variables such as: liquidity ratio, degree of coverage of passive interests, interests over turnover (like in Gorg and Alvarez, 2007), and a proxy for leverage (like in Becchetti and Trovato 2002; and Guariglia and Bridges 2007) obtained by dividing the short term and long term debts with banks over total assets. However, these variables were less robust.

³⁸ It is quite common in the literature to proxy the 'technology gap' through measures of 'productivity gap' between the foreign and the domestic firm. We also tested for another proxy for technology gap: the gap in intangible assets, which would be a better proxy of the difference in technologies adopted. However, the variable was not significant.

collateral and indebtedness and higher solvency). This preliminary finding justifies developing our analysis on potential spillovers from FDI.

Tab. 3.2.1.

Tab. 3.2.2.

3.2.3. Modelling and estimation results

3.2.3.1. Non-parametric estimates of the survivor functions

The focus of our work is to examine whether foreign firms affect domestic firms' probability of survival. We first provide a Kaplan-Meier non-parametric estimate of survival patterns for the whole sample and also distinguishing for different types of firms. Figg. 3.2.1-3.2.8. presents this preliminary evidence.

First, we may have a look at the survivor function for all firms. The rate of survival up to age 10 is 91% while only 61% of firms in our sample survive up to 50 years.

Fig. 3.2.1.

However, the negative and decreasing slope of survival functions shows that the probability of interruption is greater in the first few years of life, while the risk of failure gradually declines as firms are longer lasting (older). This is confirmed by the Kernel density function of age.

Fig. 3.2.2.

It is also worth observing that firms in high medium technology sectors endure better survival prospects than firms in medium-low tech sectors. In particular, about 70 percent of domestic firms in sectors with a higher technology survive up to 50 years, whereas for firms in higher technology sectors the probability of surviving up to that age is more than 95 percent. This is in line with our expectation of higher volatility of behaviour of foreign and of domestic firms in low technology sectors following the literature on creative destruction (Audretsch, 1991; 1995) according to which the major factor impacting on firm survival is a firm's ability to innovate.

Fig. 3.2.3.

Figure 3.3.4. presents the Kaplan-Meier estimates of the survivor function for domestic firms, foreign multinationals and domestic multinationals. The figures reveal that these two latter firm types endure better survival prospects, while domestic firms have much lower survival ratios. This result confirms what we have found in section 3.2.2. on a different dataset and suggests that the resilience of multinational firms is a robust finding obtained by non parametric testing. In this smaller dataset, the gap in survival is higher: only 75 percent of

domestic firms survive up to 25 years, whereas the same probability of survival is more than 93 percent for foreign-owned firms and 90 per cent for domestic multinationals. In order to check for the significance of the differences in survival functions we also run the log-rank non-parametric tests of homogeneity across the three groups of firms. This allows us to reject the hypothesis that the survival functions across the different firms are equal.

Fig. 3.2.4.

In order to focus on the key question of our analysis, i.e. whether foreign firms are likely to affect domestic firms' probability of survival, we carry out this test: we compare survival rates of domestic firms in sectors respectively with high and low presence of foreign firms using our dummy for foreign penetration, *high_foreign*. We do not get a clear pattern (see the graph 3.3.5.) and the log-rank test does not allow us to reject the hypothesis that the survival functions across the firms in sectors with different foreign penetration are equal.

Fig. 3.2.5.

However, when we disaggregate by high-medium high and low-medium low tech industries we observe two different patterns (Fig. 3.3.6. and Fig. 3.3.7.). Firms in high-medium high tech industries with above average rates of presence of foreign multinationals (*high_foreign* = 1) have lower survival probabilities. Conversely, the disparity in survival rates between firms in high or low FDI industries is not clear-cut if the industry is classified as low and medium low tech. This preliminary finding although do not provide us with a straightforward picture yet suggest that the impact of foreign presence on domestic firm survival might depend on the technological environment and is potentially more dangerous in more technology intensive industries.³⁹

Fig. 3.2.6.

Fig. 3.2.7.

Finally, we compare survival rates of domestic firms with low and high technology gap with respect to foreign firms respectively. We observe that firms with a low gap endure better survival prospects than firms with high gaps. In particular, less than 75 percent of domestic firms with a high technology gap with respect to foreign firms survive up to 50 years, whereas the probability of survival up to that age is more than 95 percent for firms with low technology gap (see Fig. 3.3.5).

Fig. 3.2.8.

3.2.3.2. Empirical model: FDI impact on firm duration

The Kaplan—Meier survivor functions do not consider other factors that may affect plant survival, i.e. plant-, firm-, and industry-specific factors. So we turn to the econometric estimates of an hazard function:

³⁹ Although, it must be said that the accompanying Log-rank tests shows that the difference in firm survival rates according to the foreign presence is not significant.³⁹

$$\text{exit}_{i,t} = f(\text{FDI_OWN_INDUSTRY}_{j,t}, \text{FDI_SHARE_REGION}, \text{FDI_UP}_{j,t}, \text{FDI_DOWN}_{j,t}, X_{i,j,t}, \varepsilon_{it}) \quad [1]$$

where exit of firm i in industry j at time t (see Appendix AII. Methodological notes: for the definition of firm exit) is related to FDI within the sector and within the region, which captures the competition and knowledge spillover effects of FDI (horizontal spillover), and is also related to upstream and downstream FDI, which in turn capture the forward and backward vertical linkages effects; $X_{i,j,t}$ is a vector of firm and industry characteristics (see section 3.2.2. and table 3.2.1. for the full list of the firm and industry covariates), $\varepsilon_{it} \sim N(0, \sigma^2)$ is the error term accounting for stochastic shocks at a firm level. The Cox proportional hazard model imposes the restriction that the hazard functions for different values of the explanatory variables are proportional to each other and their coefficients are constant over time (“firm age” in our case). We tested the proportional hazards assumption for each explanatory variable by the Schoenfeld test and found that the hypothesis of proportional effect is rejected for wage. Therefore, the age-varying interactions of this variable is added in the model.

We estimated both the continuous hazard model (Cox) and the discrete time version of it: i.e. the Complementary log-log or “clog-log” model (Jenkins, 2005).⁴⁰ However, in the Clog-log estimates the rho parameter (fraction of the error variation due to variation in the unobservable individual effects, which enables us to detect the unobservable heterogeneity in our model) does not allow us to reject the null hypothesis of no existence of unobservable heterogeneity. Thus, the adoption of a continuous model such as the Cox, does not entail a problem of biased estimators or spurious negative duration dependence. Since the estimation results of the two models were qualitatively same, we present here the results for only the Cox proportional hazard model (see section 3.2.2 for a formalized description of this model).⁴¹

The results of the econometric estimates are presented in Table 3.2.3. All models are stratified by year (so that each year is permitted to have a different age-dependent baseline hazard function). In this way we take into account the effects of the business cycle and other macroeconomic shocks on survival. All standard errors are clustered on firms. We could not stratify by industries as we had few observations by sectors and also many control variables at sector level which dropped out most of our sector dummies. Sector level variables, in addition to macro sector dummies, should account for possible productivity differences across macro sectors.

In estimating the hazard model using data for all manufacturing industries, we implicitly assume that the effect of the explanatory variables is uniform across different firm types. This

⁴⁰ Our estimate of the hazard function had to cope with the choice between continuous and discrete models. Firm survival is a continuous variable (a firm can exit after two and a half years). However, data are grouped by years due to balance sheet reporting (i.e. we only have annual observations on firm exit), and the majority of the covariates are time-varying. Even if we know the exact moment when the event takes place (interruption of firm activity), it is recorded in specific time-discrete intervals (annual balance sheet data). This could result in a considerable number of tied survival times, implying the risk of biased estimation of coefficients and standard errors. Secondly, in continuous models it is difficult to properly control for the existence of unobservable heterogeneity (frailty), which would lead not only to biased estimators but also to spurious negative duration dependence. Based on these considerations we estimated both a continuous and a discrete hazard model. See Jenkins “Survival analysis”(2005) for an overview of complementary log-log and proportional hazard models.

⁴¹ As according to Jenkins (2005) any standard model for binary dependent variables can be applied to estimate discrete time hazard models we also tested our results using logit and probit.

is arguably quite a restrictive assumption, given that we pool firms with different technology features and working in different technological environment. Hence, we check for two sources of potential heterogeneity in our data: the link between technology gap and spillovers, like in Girma and Gong (2008), and the link between the level of technology of the sector and spillovers, like in Görg and Strobl (2003) and Kosovà (2010).

As a preliminary check we introduce a dummy variable to capture the different behaviour of firms in low technology sectors versus high technology ones in terms of survival. The coefficients are statistically significant and below one, revealing that the hazard rates is substantially lower. A dummy variable has also been introduced to capture the different behaviour of firms which have a high technology gap (proxy for firm absorptive capacity) with respect to foreign firms, identifying two categories (low technology gap firms, i.e. $gap_1=1$; high technology gap firms, i.e. $gap_2=1$, see the list of variables in section 3.2.2 for the construction of these two dummies). The coefficient in this case is statistically not significant.

Then, we adopt a sub-samples strategy.⁴² We first check for the sensitivity of the model to alternative ranges of technology gap between foreign and domestic firms. These estimations provide a test for the absorptive capacity hypothesis (Glass and Saggi, 1998) and can be compared to the literature on the link between technology gap and productivity spillovers.⁴³ Then, we have splitted our sample according to clusters of technology⁴⁴ to which firms belong distinguishing two groupings: i) high and medium-high technology industries and ii) low and medium-low technology ones.⁴⁵

In table 3.2.3. aside the estimates for the pooled sample we also present the coefficient for the subsamples. The coefficients are presented in exponential form to express the ratio in which the dependent variable (likelihood of failure) changes as the explanatory variable goes up one unit (hazard ratio).⁴⁶

Tab. 3.2.3.

⁴²In the split samples both the baseline hazard and the effect of the explanatory variables can be dissimilar for each firm group considered. In order to check whether these differences in the covariates are significant, a likelihood ratio test of differences which compare the restricted and the unrestricted model coefficients was performed which entails the null hypothesis that both coefficients are equal. The resultant likelihood ratio test statistics were highly statistically significant, allowing us to reject the null hypothesis that the data can be pooled across the different firm types.

⁴³ See Cantwell, 1989; Kokko, 1994; Takii, 2005; Dimelis, 2005; Hamida and Gugler, 2009, which find a negative relationship, and Jordaan, 2008 and Jabbour and Mucchielli, 2007, which find a positive relationship.

⁴⁴ For a detailed list of these sectors along with their ATECO codes, see tab. 3.2.7.

⁴⁵ We first re-ran the hazard model including interaction terms of the high-tech dummies with the FDI related variables, thus allowing the coefficients of the FDI variables to vary across these two firm types. The results not reported for shortness, show that the interaction terms are insignificant. Hence we proceeded to investigate whether all coefficients should (jointly) vary across firm technology type. The likelihood ratio test of differences which compare the restricted and the unrestricted model coefficients (41.62) was highly statistically significant, allowing us to reject the hypothesis that the data can be pooled across these two firm types.

⁴⁶ Values below (above) the unit indicate negative (positive) impact of the explanatory variable on the hazard rate. In the case of a dummy variable covariate, the hazard ratio can be interpreted as the increase in the overall hazard rate for the firm when the dummy is equal to 1 while holding all other variables constant.

The overall results provide **strong evidence of horizontal intra-industry spillovers: firm survival is strongly affected by the increased presence of foreign MNEs within the same industry.** An alternative explanation of the positive effect could also be that multinationals locate in industries that have higher productivity, as argued by Aitken and Harrison (1999), and hence higher survival rates. In this case, of course, the positive result would not necessarily indicate spillovers. However, Wang (2010) argues that although FDI tend to be endogenous at the aggregate level, when the effects of industry-level FDI are examined at the firm level, as in our case, the potential endogeneity tends to disappear. Besides, the inclusion of other industry covariates along with those at the firm level, already control for the possible endogeneity of FDI. So we deem that the potential endogeneity issue of FDI at the aggregate level is not a problem at the micro-level.⁴⁷

However, a caveat is worthwhile regarding the limitation of the spillover measures we use. As spillovers cannot be measured at the firm level, due to the lack of data on inter-firm linkages, vertical spillovers are calculated using input-output tables and the sectoral classification allowed by the input-output tables, which is quite broad (NACE classifications at 2-digit level). Hence, the variation in the data is quite limited and this could lead to weaker results.

Our findings are consistent with positive intra-industry spillovers for manufacturing firms survival shown in Görg and Strobl (2003) for Ireland, Burke *et al.* (2008) for UK, Kosovà (2010) for the Czech Republic and Wang's (2010) for Canada.

Focusing on the split sample, our results are quite different. **In the group of firms with a low technology gap we find not only positive and significant horizontal spillovers but also upstream spillovers. Conversely, in the case of high technology gap firms the horizontal and backward FDI spillover variables keep the same signs but are both not significant.**

The existence of positive upstream spillovers when the technological gap is low suggests that this type of domestic firms have a higher absorptive capacity which allow them to benefit from supplies of intermediate goods and machinery from MNEs. In other words, our findings suggest that being a customer of foreign companies has a beneficial effect on a more productive firm's survival, but only domestic firms with at least a basic level of technology are enabled to adapt to better foreign technologies.

These results point to a sensible economic interpretation: MNEs in upstream industries may provide inputs to domestic firms that were previously unavailable in the country, or provide them with technologically more advanced or less expensive ones, or ensure that they are accompanied by the provision of complementary services (Javorcik, 2004). However, in the case of firms with a high productivity gap, inputs produced locally by foreign firms can be more expensive and less adapted to local requirements as foreign firms are too technologically advanced compared to local enterprises.⁴⁸

⁴⁷ Most of the literature on FDI spillovers treat the level of FDI as exogenous (see Jovarcik, 2004; Blalock and Gertler, 2008). Only Lileeva (2010) tests for endogeneity of industry level FDI but reject the hypothesis.

⁴⁸ Girma and Gong (2008) and Ayyagari and Kosovà (2010) studies of no evidence of spillovers in the same industry and no vertical spillovers of any kind in manufacturing for two emerging countries (China and Czech R.) might be interpreted as due to high technology gap/low absorptive capacity of domestic firms.

We may conclude that a certain level of absorptive capacity is needed for domestic firms to assimilate the technology brought in by the foreign affiliates. The analysis confirms that the magnitude of spillovers is crucially dependent on the technological sophistication of local firms both at horizontal and at vertical level. We observe that only Italian firms with a low technology gap are actually able to exploit spillovers from foreign competitors (both horizontally and via forward linkages between MNEs and local buyers of intermediate goods). Less efficient firms are not able to catch this opportunity. Hence, when the gap is large MNEs face some difficulty in interacting with domestic suppliers and customers. On the other hand, there is no evidence of vertical downstream spillovers. If this is not the case, foreign firms may be relatively self-sufficient and collaborate little with local firms (foreign firm 'enclaves'). Under these circumstances, downstream foreign firms might come with fully integrated upstream supply, or upstream foreign firms with fully integrated downstream distribution. We may also conjecture that when foreign firms act as customers of Italian local firms they are probably quite selective and this makes competition among local suppliers more fierce and lowers prices.

Turning to the disaggregation by technology sectors, we have ambiguous a priori on the expected outcome. Domestic firms in high tech sectors are more likely to benefit from positive spillovers as they can be assumed to have relatively high levels of technology themselves and thus to have some level of absorptive capacity i.e., the necessary stock of knowledge which allows them to utilise spillovers from multinationals. This may not be the case for domestic plants operating in low-tech sectors (Görg and Strobl, 2003). However, on the other hand, high tech sectors are more competitive and MNEs might have more incentives to prevent technology leakages to their competitors which may reduce above all horizontal spillovers. Besides, according to Burke et al. (2008), differences in innovation represent the focal point for competition in dynamic industries, then foreign ownership is more likely to lower the firm survival rate in dynamic industries, while in static industries firms are more imitative and hence have more scope to benefit from knowledge spillovers from foreign firms.

In our estimates for the technology sub-samples we find that **the presence of multinationals within the same sector and in upstream sectors has a positive effect on plant survival only for firm operating in low-medium low tech sectors, while in the high_medium high tech sub-sample both horizontal and vertical spillovers are statistically insignificant, suggesting that survival for this group is not affected by FDI linkages.** The reason of this quite unexpected result might be that in less advanced sectors Italian firms are less disadvantaged with respect to foreign firms in terms of productivity and therefore more able to absorb the knowledge spillovers spreading from foreign firms. Our results differ from Görg and Strobl (2003) and Kosovà (2010) which find that intra-industry technology spillovers are more likely in technologically advanced industries for Ireland and Czech R. respectively.

Turning to the other sector and firm specific variables, both sector and firm specific variables appear to have the expected signs.

Once controlling for several firm and industry covariates, size do not appear a significant determinant of exit in the overall sample but it is significant once splitting the sample

according to the technology intensity. It is interesting to observe that in low tech sectors small firms experience lower exit rates whereas it is the opposite in high tech sectors.

Productivity consistently reduces firm exit (by about 50 per cent). This result is mainly related to firms in low and medium-low tech sectors and to firms with a high technological gap.

The change in the wage variable (wage interacted with age) is significant and consistently reduce exit for firms operating in high tech sectors or with low productivity gap. These results are not surprising if we think of the stronger link between productivity and wages which exist in some sectors and in more efficient firms.⁴⁹

The sector export intensity reduces the risk of dying but only for those firms with low productivity gap.

In addition, firms with low technology gap benefit of industries high entry rates getting a risk of dying which decreases by about 29 per cent with each percentage increase in entry rate. These firms also benefit of industry concentration (the Herfindhal index) with about a 50 per cent lowering in the hazard rate. Conversely, the minimum efficient scale has a negative impact: firms entering into sectors characterized by the existence of large firms are less likely to survive, maybe due to stronger competition.

3.2.4. Conclusions

FDI affiliates in a host country interact with its indigenous plants in many ways—as competitors, input suppliers and customers. FDI affiliates compete for market shares with domestic-owned plants in the same industry (intra-industry economic linkages), they supply intermediate inputs to domestic-owned plants (the upstream inter-industry linkages), and they purchase products produced by domestic-owned plants (the downstream inter-industry linkages). Through these intra- and inter-industry economic linkages FDI generates significant impact on indigenous plants. These effects can be shown through productivity changes, plant /firm death/survival and employment adjustment. Here, we have examined the effects of FDI on the survival of manufacturing firms located in Italy. In the following section we will also focus on employment changes.

The study finds that the presence of FDI in Italy exerts contrasting effects on manufacturing firms. These tend to be affected positively by competition from FDI affiliates operating in the same industry, and also benefit from FDI affiliates operating in upstream industries through inter-industry economic linkages while end up with shorter lives (and more deaths) due to FDI in downstream industries. We may conclude that the effects of FDI mostly come from those industries with which plants closely interact as competitors or as input suppliers. Conversely there is no evidence that foreign firms facilitate knowledge transfer to local firms

⁴⁹ This variables allow to take into account the skill level at the firm level, as firms employing more skilled workers are expected to pay higher wages. The higher wage/skill in the firms would improve the probability of surviving of the firm.

to enable them to produce intermediate inputs more efficiently, thereby making them available to foreign firms upstream at a lower cost.

We verify the relevance of spillovers in relation also to the absorptive capacity of domestic firms from MNEs: the level of technological gap matters considerably for the spillover effect and only the Italian firms with a low technological gap are in fact able to exploit spillovers. Finally, also the technology of the sector influences spillover: firms in low-medium low tech sectors seem to take advantage of positive externalities from MNEs (in the upstream sectors and in the same sector). This might suggest that domestic firms are more imitative in these sectors and therefore more able to absorb the knowledge spillovers from foreign firms.

There is scope to enhance the results of this investigation but this would entail more detailed data on foreign investment. First of all, it would be important to test for the differential impact of Greenfield FDI (increased capacity and lowering of prices) versus M&As. Second important task might be to test for the impact of the country/region of origin of FDI. Then, it would also be important to disentangle between horizontal and vertical FDI to test for the market orientation of FDI (export platform FDI and market seeking FDI versus cost saving FDI) like in Girma and Wang (2008). Last but not least, instead of using quite aggregated input-output data it would be useful to get firm level data able to catch the firm-to-firm exchanges, and therefore also foreign and local firms linkages within and across industries and sectors

3.3. Foreign ownership and firm growth

In this part of the report, we will analyze how the presence of foreign firms impacts on the growth process. In this section we will use regression analysis of firm employment growth to check for two things: first, to test if there is any statistically significant difference between growth rates of domestic and foreign firms, and secondly, whether spillovers from foreign firms have any effect on the growth rates of domestic firms.

3.3.1. Econometric model

The growth rate of firms follows a stochastic process that, following Gibrat (1931),⁵⁰ could be expressed as:

$$\frac{E_{i,t+1}}{E_{i,t}} = \alpha E_{i,t}^{\beta-1} \varepsilon_{i,t+1} \quad [2]$$

$E_{i,t+1}$ is the size of firm i at time $t+1$ and $E_{i,t}$ is the size of firm i in some previous period t . α is some constant growth rate (drift rate) which is common to all firms. $\varepsilon_{i,t}$ is the random

⁵⁰ Gibrat's law (1931) is a prominent model of firm growth according to which the growth rate of a given firm is independent of its size at the beginning of the period examined. In other words, "the probability of a given proportionate change in size during a specified period is the same for all firms in a given industry - regardless of their size at the beginning of the period" (Mansfield, 1962, p. 1031). Therefore the actual firm size should be independent from the previous size. Gibrat's Law can be empirically tested in at least two different ways. Firstly, one can assume that it holds for all firms in a given industry, including those which have exited the industry during the period examined (setting the proportional growth rate of disappearing firms equal to minus one). Secondly, one can postulate that it holds only for firms that survive over the entire time period.

shock, assumed to be identically and independently distributed. Taking natural logarithms and rearranging the terms in [7], results in an equation of the following form:

$$\ln E_{i,t+1} - \ln E_{i,t} = \beta_0 + (\beta_1 - 1)\ln E_{i,t} + u_{i,t+1} \quad [3]$$

where $\beta_0 = \ln \alpha$ and $u_{i,t+1} = \ln \varepsilon_{i,t+1}$

In such a situation the value of β_0 (the constant growth rate) determines whether the average size of firms is increasing or contracting, a negative value suggests contraction while a positive value suggest that firms on average are tending to grow. The β_1 represents the effects of initial size on the subsequent rates of firms growth. If $\beta_1 = 1$ then firm size has no effect on growth and the law of proportionate effect holds. If $\beta_1 < 1$ this implies that small firms on average grow faster than their larger counterparts.⁵¹ If $\beta_1 > 1$ then large firms tend to grow faster than smaller firms.⁵²

We can transform the [8] as follows:

$$\ln E_{i,t+1} = \beta_0 + (\beta_1 - 1)\ln E_{i,t} + \ln E_{i,t} + u_{i,t+1} \quad [4]$$

That can be written as:

$$\ln E_{i,t+1} = \beta_0 + \beta_1 \ln E_{i,t} + u_{i,t+1} \quad [5]$$

Controlling for other variables X we have:

$$\ln E_{i,t+1} = \beta_0 + \beta_1 \ln E_{i,t} + X_{i,t} \beta + u_{i,t+1} \quad [6]$$

Three traditional econometric issues arise in employment growth estimates. The first concerns the heteroskedasticity, which may occur when the Gibrat's Law is not confirmed (i.e. if small firms grow faster than their larger counterparts, the variance of growth should tend to decrease with size). Secondly, there is a crucial problem of sample selection: if survival is not independent of firm's initial size, i.e., if smaller firms are more likely to exit than their larger counterparts, empirical tests can be affected by a sample selection bias and estimates must take account of this possibility. A third issue was first discussed in a seminal paper by Chesher (1979) and concerns the fact that, when there is serial correlation in growth rates, ordinary least squares (OLS) estimators are inconsistent.

Several studies have dealt jointly with one or more of these econometric problems now discussed (see Lotti et al., 2003, for a survey). For the Italian context, Contini and Revelli (1989) using data from a panel of manufacturing firms located in the Northern Italian region of Piedmont demonstrated that the departures from Gibrat's Law were "modest". Another

⁵¹ This situation is termed 'regression' to the mean and it indicates a tendency for firm size to return to the mean size for the population (Weiss, 1998).

⁵² This latter outcome would imply that the time path of the size measure is explosive, which is possible over a short period of time but not over a longer period of time (Wilson et al., 2000).

study based on Italian data has been conducted by Solinas (1995) and in this case, smaller firms turned out to grow faster than larger ones (once the original sample had been limited to companies with at least one employee). Lotti et al. (2003) using data set from the Italian National Institute for Social Security (INPS) and controlling for sample selection and heteroskedasticity found that in some (but not in all) selected industries in Italian manufacturing Gibrat's Law fails to hold in the years immediately following start-up, when smaller firms have to rush in order to achieve a size large enough to enhance their likelihood of survival. Conversely, in subsequent years the patterns of growth of smaller firms do not differ significantly from those of larger ones, and the Law is therefore confirmed.

To estimate our growth model (which can be assimilated to a labor demand model) we use dynamic panel data techniques. We adopt specifically the GMM-system method developed by Blundell and Bond. The GMM-system method takes into account unobserved firm-specific effects and the endogeneity of the lagged dependent variable ($\log(E_t)$) in the model.⁵³ The main limitation of the GMM-system method in our context is the fact that there could be attrition bias because some firms exit from the market and exit is not a random process. As discussed in Hall (1987), Evans (1987), Mata (1994), Dunne and Hughes (1994), Sutton (1997) and Weiss (1998), the appropriate econometric method to deal with this problem of selection bias is the two-step procedure suggested by Heckman (1979)⁵⁴ (see also Maddala, 1983; Amemiya, 1984; Greene, 1993). Moreover, in this contest we have panel data, consequently we have to deal with a Heckman sample selection with panel data (see Wooldridge, 1995). See section A.II in Appendix A for a detailed description of this method. We estimate an unbalanced panel as we consider both surviving and non surviving firms to take into account the so called "survivorship bias". In fact, since growth can only be measured for firms which have survived over the entire examined period, and since slow growing firms are more likely to exit, small fast growing firms may be over-represented in the surviving sample and this may bias the results of the empirical research.⁵⁵

⁵³ The idiosyncratic shock may adopt an autoregressive form, capturing factors such as omitted characteristics that persist or non-instantaneous adjustment. By performing a Sargan test the hypothesis of correlation between residuals and lagged value of the dependent variable could not be rejected. For this reason we turned to GMM method using GMM instruments (1-3 lags) for all firm level variables. This estimation method allows us to assume that firm characteristics are endogenous variables and use them as instruments. The System-GMM is derived from the estimation of a system of two simultaneous equations, one in levels (with lagged levels as instruments) and the other in first differences (with lagged first differences as instruments).

We decided to use the GMM (Generalized Method of Moments) technique (GMM-System) as Blundell and Bond (1998 and 2000) show that, when the dependent variable follows a path close to a random walk, the differenced-GMM (Arellano and Bond, 1991) has poor finite sample properties, and it is downwards biased, especially when T is small.

⁵⁴ The Heckman selection model is based on estimating two equations, the first one is the selection model (the determinants of survival), and the second one is the growth model that includes a selectivity-bias correction term derived from the estimates of the selection model. See section A.II in appendix A for a detailed description.

⁵⁵ Albeit many empirical studies often select a sample of only surviving firms, such a choice may bias the results. If the investigation would be carried out only on surviving firms the selection of the sample might be correlated with the same variable which may affect firm growth. For instance, small firms may be more likely to fail and may not be more likely to grow than larger firms. This would lead to an underestimation of the estimated impact of size. Similarly, the results might be biased in favour of foreign-owned firms if they present higher survival probabilities, leading to the conclusion that foreign ownership has a significant explanatory power upon firm performance measures (Alvarez and Görg, 2009).

All explanatory variables used in the Cox proportional hazard model are also used in the growth model and we also add (log) age of the firm into the model.⁵⁶

3.3.2. Results

As the GMM-system model and the Heckman model results are quite similar we will only comment the former.

First of all, in the overall sample we find that foreign ownership does not have a significant impact on growth. Furthermore, foreign spillover variables have generally a not significant impact on growth rates neither on firms competing in the same sector nor on buyer and sellers. Therefore, it seems that both competing with foreign firms and buying or selling inputs from them has no detrimental effect on the growth prospects of domestic firms. However, the share of foreign firms in the same industry (FDI_OWN) has a negative impact on firms with higher technology gap. Moreover, the share of foreign firms in buyer industries (FDI_DOWN) has a negative impact on firms belonging to low tech sectors. Besides, firms located in regions where the share of foreign firms increase rapidly are less likely to grow. Hence, local spillovers are not at work and there is a strong local displacement. These results are consistent with those shown in the Heckman model in Appendix. As expected in the Heckman model the effect of size is lower given that the selectivity-bias correction term derived from the estimates of the selection model is meant to correct for an overestimate of growth for the surviving firms.

Turning to the other sector-specific variables we observe that they have a strong impact on the growth rates of firms. Firms operating in sectors that experience high growth rates in output also grow more. Firm growth rates are also higher in more concentrated sectors (Herfindhal). Hence, the lack of competition has a positive impact on the growth rates of firms. However, firms tend to grow less in sectors characterized by high minimum efficient scale (MES). This could be due to the need to reach minimum efficient scale sooner to be competitive in the market.

Firm-specific variables also have the expected effects. Firm size was expected to have a negative impact on growth (that means, the coefficient of current size variables is expected to be less than one). This result is confirmed as the coefficient of current size variable (*llab*) is positive but less than one, adding another evidence in support of the stylized fact that small firms growth faster. Then the Gibrat law (elasticity equal to 1) should be rejected. This is consistent with what was also found in Lotti et al. (2003) and in most previous empirical research.

The inverse relationship between age and growth is confirmed: mature firms have lower growth rates consistently with the theory, and also with previous studies (among all Lotti et. al., 2009). Firms paying higher wages (presumably due to the fact that higher wages mean also higher skilled workers) and firms with higher productivity grow faster. Capital-intensive firms tend to grow less in low tech sectors possibly because of the complementarities between capital and skilled labor. More indebted firm achieve faster growth. The variable for R&D is not shown as it have positive but statistically insignificant coefficients possibly because the

⁵⁶ Note that the Cox proportional hazard model also includes the age of the firm in the nonparametric part (baseline hazard function).

panel is short for that dataset and unobserved firm-specific effects dominate the contribution of the R&D variable that do not change much over time.

Tab. 3.3.1.

4. The Turkish Case

4.1. Data and Stylized Facts About FDI in Turkey

As a background to the empirical analysis, we will first start with a section on Turkish economy and the FDI inflows to Turkey over the last two decades. Following this brief overview, we will undertake a descriptive statistical analysis. This section concentrates on total inward and outward FDI flows since 1990s, sectoral patterns of inward and outward FDI flows, distinguishing the manufacturing from the service sector (real estate, tourism, telecommunication, banking and insurance). Among the main factors that shape the characteristics of inward FDI in Turkey we consider the mode of entry, the origin and sectoral composition of FDI, the MNEs' strategies and objectives, the changes in the institutional and economic structure of Turkey and the government policies to attract more FDI. We conclude the section with a review of databases we will use in the analysis.

4.1.1. Stylized Facts about FDI in Turkey

Turkey followed an inward-looking, import-substituting development strategy during the 1960s and 1970s. Although this strategy worked well throughout the 1960s, it proved impossible to follow in the wake of oil price hikes in 1974 and 1979. After a severe balance of payments crisis in 1979 and a jump in the inflation rate to 64 percent, an IMF-backed stabilization program was launched in January 1980. These measures marked the adoption of an outward-oriented growth strategy.

In order to accomplish the external adjustment, export-oriented growth became the key policy objective and the government used export subsidies to promote exports. Starting from 1984, export-oriented policies had later been coupled with a gradual reduction in tariffs and nontariff barriers, and finally culminated in the Customs Union (CU) with the European Union (EU) in 1996. As a result of the outward-oriented growth strategy, Turkish exports increased from \$2.9 billion in 1980 to reach \$13 billion and \$28 billion in 1990 and 2000, respectively.

Turkey adopted its first FDI legislation in 1954. Although the Law provided a quite liberal framework of general principles designed to create a favorable environment for FDI, inward foreign investment remained at low levels until the early 1980s, and the *cumulative* total of FDI authorized from 1950 to 1980 reached only US\$229 million (Öniş, 1994), partly because of some barriers for inward FDI and weak enforcement of rules and regulations. After the elimination of local equity participation and minimum export requirements in the 1980s (Erdilek, 1986), and complete liberalization of Turkey's capital accounts in 1989, annual inflows of FDI reached almost US\$1 billion in the 1990s. The manufacturing industry alone

accounted for 55 percent of cumulative authorized FDI in the 1980s and 1990s (see Taymaz and Ozler, 2009).

Turkey missed the opportunity to benefit from the first two waves of the increase in international FDI flows, in the 1980s and the 1990s, respectively. In the first wave, the international FDI flows increased from \$54 billion in 1980 to \$207 billion in 1990.. In the 1980s, the inward FDI flows to Turkey fluctuated around \$100 million. During the second wave, the FDI flows increased even faster to reach \$1.4 trillion by 2000. Turkey missed this opportunity, too. As can be seen in Figure 4.1.2, in the 1990s the FDI inflows moved up to fluctuate within the band between \$500 million and \$1 billion.

It was mostly developed countries that were benefitting from the increased FDI flows during the first wave of the 1980s.. For that reason, whatever policy Turkey implemented during the period might not be sufficient to convince foreign investors to invest in a developing country. However, during the second wave, inward FDI flows in developing countries increased from \$35 billion in 1990 to reach \$256 billion in 2000.

The poor performance of Turkey in attracting FDI inflows was also due to the political and economic instability that haunted the Turkish economy throughout the period. Competition among the political parties led to increasing budget deficits. As a result, the country suffered from an inflation rate that averaged around 60 percent. The GDP followed boom-bust cycles throughout the period. Consequently, the high country-risk also helped keep foreign investors at bay.

Inward FDI flows to Turkey also suffered from governance and institutional problems in the areas of rule of law and competition. As of the early 2000s, Turkey lagged behind in terms of providing a level playing field for all companies (see Dutz, Us, and Yılmaz, 2005). In 2000, Turkey was ranked among the top contenders, after Iceland and Canada, based on OECD's FDI restrictiveness index.

The 2001 economic crisis was the turning point for the prospects of the Turkish economy. First, immediately after the crisis an IMF-backed stabilization program was implemented, along with key macroeconomic reforms that had been delayed for more than a decade. Second, the November 2002 general elections brought the country much needed political stability. In addition, throughout the 2000s Turkish government had undertaken significant measures to improve the investment climate for domestic as well as foreign investors. A new Foreign Direct Investment Law was enacted in 2003.

Turkey finally benefitted from the third wave of the global FDI flows that started again in 2003 and lasted until the global financial crisis of 2008. Even, then improvements in the inward FDI flows did not take place immediately. The increase in inflows after the implementation of macroeconomic and institutional reforms in 2001 and 2002 was rather limited.⁵⁷ For a couple of years after the crisis, the FDI inflows stayed above \$1 billion but not significantly higher. FDI inflows to the country had increased significantly only after the EU Council decision of December 2004 that approved the initiation of membership negotiations with Turkey. After this decision, both the M&A deals and real estate purchases

⁵⁷ In the year of crisis, the inward FDI flows increased to \$3.3 billion, but this was mostly due a one-time sale of mobile telecommunication license to a Turkish-Italian consortium.

undertaken by European citizens and corporations increased immediately. FDI inflows including real estate sales to foreigners increased to \$10 billion in 2005, followed by a doubling of that amount in three consecutive years from 2006 to 2008. Even though, the inflows declined after the global financial crisis, they nevertheless recovered to reach \$16 billion in 2011.

From 2005 through 2011 foreign direct investment in Turkey (excluding real estate purchases and loans to affiliated firms) amounted to a total of \$87 billion. In comparison, FDI inflows over three years from 2002-2004 amounted to \$2.5 billion only. More than two-thirds of the inward FDI flows from 2005 to 2011 (\$59.5 billion) were invested in services sectors. In contrast, the manufacturing industries attracted \$16.8 billion over this period. With \$11 billion, electricity and gas industry was the other major recipient of foreign direct investment from 2005 to 2011. Mining and quarrying industry, on the other hand, attracted only \$1 billion.

Within the services sector, the financial and insurance services received \$37 billion in FDI inflows, followed by information and communication services (\$10.4 billion), wholesale and retail trade (\$4.4 billion), transportation and storage (\$1.9 billion) and construction (\$1.8 billion). In the four years following the EU's decision to initiate negotiations with Turkey towards full-membership (2005-2008), banking sector was responsible for nearly half of the FDI inflows to the country. Having realized the country's potential as a growth market, the European banks (Dutch, Belgium, Greek, French, Italian banks among others) went on a shopping spree and grabbed Turkish banks paying sizeable premiums.

The fact that Turkish banks and companies in general attracted attention of multinational firms and banks much later than the economic crisis of 2001 is a point that needs special emphasis. Many emerging market economies experienced fire-sale-FDI following their economic crises. Following the emerging market crises in the 1990s market values of local companies plunged along with the devaluation of national currencies, which made these companies as attractive acquisition targets for foreign investors. This phenomenon, known as the fire sale FDI, has been observed in the East Asian countries, as well as countries such as Brazil, Mexico and Russia. The only exception to the rule was Turkey: In the three-year period following the 2001 crisis, foreign companies preferred to stay away from acquiring a stake in Turkish companies. The main factor influencing their decision was the rather high country risk. However, with the EU decision to start negotiations, and due to sustained growth and macroeconomic stability Turkey's country risk declined substantially by early 2005. As a result, Turkish companies, especially in the financial sector, had become more attractive acquisition targets in 2005. While FDI inflows amounted to less than 1% of the GDP before, it reached record levels of 9.6 billion USD in 2005, in part due to privatizations.

It is interesting to note that automotive industry that has grown considerably over the last decade and became the leading export sector attracted very little inward FDI flows. From 2005 to 2011, it attracted only \$660 million in FDI, 0.7% of total inward FDI flows over the period.

An important characteristic of the Turkish economy has been its inability to develop indigenous technology. As of 2011, high-tech industries accounted less than 2% of exports of Turkey. As a result, it is important for Turkey to attract investment in high technology sectors. Inward FDI flows in the high-tech computers, electronic-electrical and optical equipment

industry, Turkey attracted \$1.28 billion in FDI since 2002, a mere 1.45% of the total inward FDI flow over the period.

The share of foreign firms⁵⁸ in the total number of firms in manufacturing increased continuously from about 1.5 % in 1984 up to 4 % in the late 1990s (Figure 4.1.1). Their employment share of foreign firms was 9 % in 1984, with about 55,000 employees. The share of foreign firms in employment increased especially after 1988 to reach 13 % in 2001, with about 128,000 employees. The share of foreign firms in the value-added of the manufacturing industry increased faster than the employment share. Starting around 20% in 1984, the foreign firms increased their share in manufacturing value-added to 32% by 2001. The value-added share of foreign firms has always been higher than their employment share, because foreign firms tend to use more capital-intensive technologies.

Figure 4.1.1.

As we will discuss later, Turkey experienced a discontinuity in 2002 in the collection of firm-level data. As part of the government's efforts to harmonize its statistical data collection methodologies with the EU, there was a major revision in the surveys of manufacturing. As a result the coverage of firms in the manufacturing industry increased substantially. As most foreign firms were large firms, the increase in the number of foreign firms was not as significant. As a result, in 2003 there was a drop in the value-added, employment and number of firms share of foreign firms (see Figure 4.1.4). In the 2000s, the number of foreign firms stabilized around 3%, whereas the employment and value-added shares increased by 3 and 5 percentage points, respectively.

Close to 90 percent of the cumulative inward FDI flows (2002-2011) to Turkey originated from developed countries. Europe alone accounts for \$70 billion out of \$91 billion worth of FDI inflows Turkey attracted during the period. With \$15.6 billion investment, companies from Netherlands invested the most in Turkey from 2002 to 2011, followed by the U.S. (\$8.1 bn.), Belgium (\$7.3 bn.), Austria (\$7.1 bn.), Greece (\$6.6 bn.), France (\$6 bn.), Luxembourg (\$5.4 bn.), Germany (\$5 bn.), and the United Kingdom (\$4.6 bn.). During this period, the cumulative FDI inflow to Turkey from Italy was \$1.9 billion. Among the top ranking investors outside of the Europe and the U.S. are the United Arab Emirates, Russia and Azerbaijan.

The rapid increase in the number of foreign owned new establishments was certainly a reflection of the increased attractiveness of Turkey as a destination for FDI flows. The number of foreign-owned establishments was 4192 as of the end of 1999. In 2000 through 2002, the number of new foreign-owned establishments was less than 500. This number increased rapidly in the period 2003-2007, reaching 3,629 in 2005 (Table 4.1.1). During the crisis period the number of new foreign-owned establishments declined to 2,936 in 2009, and recovered afterwards to reach 4,357 in 2011. The statistics on the number of newly established foreign-owned establishments depict such an optimistic panorama that it is used by politicians to substantiate the increase how much foreign interest in Turkey has increased during recent years. However, it is not correct to use this data without complementing it with figures demonstrating the size of the foreign-owned companies.

⁵⁸ Following the usual convention, "foreign firms" are defined as those joint ventures where foreign ownership is 10 percent or more. Joint ventures with more than 50 percent foreign ownership are "majority-owned foreign firms".

According to Table 4.1.1, in 2004 and 2005 approximately 95% of the new foreign-owned establishments had less than \$500,000 equity capital each and, therefore, were small establishments. The number of new foreign-owned establishments with over \$500,000 in equity capital was 97 in 2004, this figure has increased to 208 in 2006 and to 408 in 2011. This data, which demonstrates company sizes, matches with the UNCTAD data we have presented above: Even though, the increase in FDI inflows was mostly due to several big ticket M&A deals in the banking sector, over time Turkey has experienced robust increase in the number of greenfield projects and the number of large newly-established foreign-owned companies.

Table 4.1.1.

In 2004, Turkey was not considered as a center of attraction for FDI in indices issued by A.T. Kearney and UNCTAD. In other words, it could not make to the top 25 list based on the score it received in the calculation of these indices. Since then Turkey traveled a long road. In 2007 Turkey was ranked 20th based on the A.T. Kearney's FDI Confidence index. Even though, it fell slightly behind to the 23rd slot in 2010, it is ranked 13th in 2012. With this ranking Turkey proves to be a destination for foreign direct investment better than countries like Japan, France, South Korea, Canada, Switzerland and Spain.

Figure 4.1.2.

As of 2012, inward FDI stock of Turkey reached to a level, which is just 18 percent of its GDP. This is a level much higher than what it used to be. Yet, it is still quite low. Every year, OECD prepares a graph where it plots the FDI stock/GDP ratio with the regulatory restrictiveness of the economic environment, which is reproduced in Figure 4.1.2. There is a negative association between the two: Countries that have more restrictive regulatory environment tend to attract lower amounts of FDI inflows and end up having lower stocks of inward FDI relative to GDP. Turkey is one of the outliers to this relationship: Even though it has a low regulatory restrictiveness index (0.07), its inward FDI stock/GDP ratio is just 0.18, much lower than 0.41, the ratio that is implied by the estimated relationship.

4.1.2. TURKSTAT's Industrial Analysis Database: 1983-2001

Data for Turkey will be obtained from the Turkish Statistical Institute Databases. As TURKSTAT does not permit the database to be removed from its premises the empirical analysis will be conducted in Ankara at the premises of the TURKSTAT.

In this study, for the period from 1983 to 2001 we will use the TURKSTAT's Industrial Analysis Database. From 1980 to 2001 TURKSTAT periodically (every 5 years) conducted Census of Industry and Business Establishments (CIBE) for all establishments and Annual Surveys of Manufacturing Industries (ASMI) for establishments with 10 or more employees. The set of addresses used during ASMI is obtained through CIBE. In addition, every non-census year, addresses of newly opened private establishments with 10 or more employees are

obtained from the chamber of industry. For this study, we will use a sample that matches plants from CIBE and ASMI for the 1990–2001 period.

The data set for 1982-2001 is assembled at the plant level and does not take into account the organic link between different plants that are under the ownership of the same firm. There are multi-plant firms in the Turkish industry. However, the number of these firms is rather limited. Therefore, considering only the data at the plant level does not cause any bias for our estimations.

The data is well suited for our purposes because it contains information on variables that are commonly used in estimation of plant level production functions as well as on a diverse set of plant characteristics that can be used in the estimation of the hazard function for the survival of the firm. CIBE does not include plant with less than 10 employees. Even though, not all the key variables needed for this study have been collected for establishments in the 10-24-size group. Thus our sample for the 1983-2001 period consists of plants with 10 or more employees.

4.1.3. TURKSTAT's Annual Industry and Service Statistics Database: 2002-2009

TURKSTAT revised its industrial survey approach in 2001. Starting in 2002, TURKSTAT started to collect data for establishments in the service sectors along with the ones in the industry. As the aim was to reach to a wider sample of establishments, TURKSTAT simplified the survey questionnaires. As a result, the data series in the database are no longer comparable to the series in the database in 2001 and before. For that reason, we worked with both datasets, but the analyses had to be conducted separately.

4.2. Foreign ownership and firm survival

4.2.1. Empirical strategy

In this section, we will analyze the effects of foreign presence on domestic firms' survival probabilities.

There are various methods that can be used to test the effects of economic variables on the survival probabilities of firms. The Cox proportional hazards model is used frequently in empirical studies. It defines the probability of exit in a certain time period as a function of a set of time-varying covariates, conditional on surviving until that time period. A functional is assumed for the hazard function in the empirical implementation of the model. A proportional hazard function is defined by

$$h_{ij}(t) = h_j(t) \exp(X_{ij}\beta) \quad [7]$$

where where $h_j(t)$ is the industry-specific baseline hazard function, X is a vector of explanatory variables, and β is a corresponding vector of coefficients. The β parameters are estimated by the maximization of the partial likelihood function that does not require the specification of $h_j(t)$. Subscripts i, j , and t denote “firm”, “industry”, and “time”, respectively. Note that the Cox proportional hazards model estimates the probability of hazard, i.e., exit. Time is measured after entry, i.e., it is equal to the age of the firm. Therefore, we can add time dummies into the model to control for the effects and common time-specific effects (for example, macroeconomic conditions). The change in the hazard rate by age is incorporated into the underlying, non-parametric hazard function, $h_j(t)$.

Since exit is a discrete event (exit or not, or its opposite, continue or not), binary choice models such as logit and probit models are also frequently used. These models are defined by

$$Pr(y_{it} = 1/X_{it}) = G(X_{it}\beta) \quad [8]$$

where $Pr(y_{it} = 1/X_{it})$ if the probability function for $y_{it} = 1$ conditional on X_{it} , X is a vector of explanatory variables, and β the corresponding vector of coefficients. $G(\cdot)$ is a function taking on values strictly between zero and one, i.e., $0 < G(z) < 1$, for all real numbers z . In the case of logit model, a logistic cumulative density function is used for $G(\cdot)$, whereas the probit model uses standard normal cumulative density function.

In this study, we estimated Cox proportional hazard, logit and probit models. Since the estimation results of all models are qualitatively same, we present the results for only the Cox proportional hazard model.

The dependent variable in the Cox proportional hazard model is the event of a firm's exit at a particular age t , conditional on the fact that the establishment survived until that age. The exit of those firms that survived until the end of the dataset (2001 for 1984-2001 dataset and 2009 for 2003-2009 dataset) is not observed, i.e., the distribution of the dependent variable is censored at that year.

In the estimation of the Cox proportional hazards function, we included a dummy variable that denotes if the firm is foreign-owned or domestic. This variable is used to check if the hazard probability of foreign firms is different from that of domestic firms. However, since domestic and foreign firms could react to external conditions differently, we run also separate regressions for domestic and foreign plants, and compare the differences between the determinants of survival. Domestic firms dominate the sample of firms in the datasets (more than 95 % of firms are domestic), and estimation results for the whole sample (including the foreign firm dummy) are almost identical to the results obtained for the subset of domestic firms. Therefore, we present the results for the whole sample, because the coefficient of the foreign firm dummy can be used directly to test survival differences between domestic and foreign firms.

There are three sets of explanatory variables. The first set includes sector-specific variables that measure various aspects of spillovers from foreign firms. There are two variables for horizontal spillovers: $fdiqs$ and $fdiqr$ are output shares of foreign firms in the sector (defined

at the 4-digit level)⁵⁹, and region⁶⁰, respectively. If there are horizontal sectoral spillovers emanating from foreign firms, those firms operating in sectors in which foreign firms produce a large part of output are more likely to benefit from these spillovers. If spillovers have a regional dimension and are not sector-specific, or if foreign firms help to attract resources to the region (agglomeration effects), then the regional spillovers variable (*fdiqr*) would have a positive impact on domestic (and other foreign firms).

These two variables could also capture competitive pressures foreign firms exert on others. If foreign firms intensify competition in the sector (because of their higher quality products, more productive technologies, etc.), or in the region (for example, by increasing the demand for scarce resources such as skilled labor), domestic firms would find it more difficult to survive. If the competition effects dominate spillover effects, the coefficients of these variables will be positive in the Cox proportional hazards model.

Note that these two variables (sectoral and regional shares of foreign firms) could capture only static effects, if any. However, one may conjecture that the level of foreign presence may not be so important, but the *change* in foreign share could have dynamic impact on domestic firms. In order to test if the dynamic effects are significant, we included two additional variables, the change in the sectoral and regional shares of foreign firms (*cdiqs* and *cfdiqr*, respectively) in percentage points.

Spillovers from foreign firms are likely to move towards vertically related domestic firms. Therefore, we define two variables for vertical spillovers that measure the share of foreign firms in user sectors (*fdisupp_q*), and the share of foreign-firms in supplier industries (*fdibuy_q*). Since there is no data on inter-firm linkages, we used input-output tables to calculate shares of foreign firms in supplier and buyer industries. These variables are defined by

$$fdisupp_q_{jt} = \sum_{k \in K} s_{kt} \omega_{kj} \quad [9]$$

where *fdisupp_q_{jt}* is the share of foreign firms among the suppliers to sector *j* at time *t* (*t* here denotes calendar time), *s_{kt}* the share of foreign firms in sector *k*'s output at time *t*, *ω_{kj}* the share of sector *k* in sector *j*'s inputs, and *K* the set of supplier sectors, and

$$fdibuy_q_{it} = \sum_{l \in L} b_{lt} \omega_{li}$$

where *fdibuy_q_{it}* is the share of foreign firms among the purchasers from sector *i*'s at time *t*, *b_{lt}* the share of foreign firms in sector *l* at time *t*, *ω_{li}* the share of sector *l* in sector *i*'s output, and *L* the set of user sectors. The *ω* values are calculated from Input-Output tables (1990 table for the 1984-2001 dataset and the latest available one, the 2002 table, for the 2003-2009 dataset), and *s* and *b* values are calculated from aggregated firm-level data (annual surveys).

⁵⁹For sectoral classification, ISIC Rev 2 is used for the 1984-2001 dataset, and NACE Rev. 1 for the 2003-2009 dataset.

⁶⁰“Region” is defined at the province level for the 1984-2001 dataset and at the NUTS 2-level regions for the 2003-2009 dataset.

A number of firm-level and sector-level control variables are included into Cox proportional hazards models. It is a stylized fact that large firms are more likely to survive. We included relative size, *relsize*, to control for if size matters in Turkey, too. The *relsize* variable is defined as the log ratio between the number of employees in the firm and the geometric average number of employees per firm in the sector:

$$relsize_{ijt} = \log(E_{it}/S_{jt}) = \log(E_{ijt}) - \log(S_{jt}) \quad [10]$$

where E_{ijt} is the number of employees in firm i operating in sector j at time t , $\log(S_{jt}) = \frac{1}{N_{jt}} \sum_{i \in j} \log(E_{ijt})$, and N_{jt} the number of firms in sector j at time t . We use the size variable relative to the sector average because there are substantial differences between average firm sizes across sectors. However, we experimented with the absolute firms size, and the results were similar.

The quality of labor could also be a factor that affects the survival prospects of a firm. Since we do not have a variable consistently available for two datasets to measure the skill level at the firm level, we use the logarithm of average wage rate in the firm (lw) as a proxy variable, because firms employing more skilled workers are expected to pay higher wage. If the skill level in the firm improves the survival probability of the firm, the coefficient of the lw variable in the Cox model is expected to be negative.

Firms' main objective is to earn profit, and long-term profitability could be a decision factor in exit decision. We use profit margin (the share of gross profits in output), *pmargin*, as a proxy for long-term profitability.

There are two variables that are used to capture the effects of inter-firm linkages: *subinput* and *suboutput*. The *subinput* variable is measured as the share of inputs subcontracted to other firms, and the *suboutput* is the share of output produced as a subcontractor. If a firm gets all of its output from other firms on subcontracting relations, then the value of *subinput* will be equal to 1. The value of *subinput* will be higher for firms that behave as main contractor. The *suboutput* variable is an indicator for subcontractors, and the value of that variable will be equal to one for a pure subcontractor that produces all of its output according to a contract signed with the main contractor. If the subcontracting relationship transfers the risks and costs into subcontractors, and if a firm can increase its survival prospects by subcontracting some of its processes to subcontractors, then the coefficient of the *subinput* variable is expected to be negative, and the coefficient of the *suboutput* variable positive.

The exit probability of a firm is likely to be lower where durable specific (sunk) capital costs are more important. Capital intensity (kl) is used to capture the effects of specific capital costs, and it is defined as the (log) capital/labor ratio where "capital" is measured by annual depreciation allowances (deflated by the private sector investment deflator). Thus, we expect a negative coefficient for the kl variable in the survival model.

In order to measure the level of technological sophistication of the firm, two dummy variables are used: *ttrans* and *rrdum*. The *ttrans* variables takes the value one if the firm transferred technology from abroad in terms of know-how agreement, licensing, etc., and zero otherwise. The *rddum* variable denotes if the firm performed any Research and Development (R&D)

activity in that year. If higher technology improves survival probabilities, these two variables would have negative coefficients.

There are a number of sector-specific control variables included in the model. The exit rate is expected to be higher when a sector experiences a large number of entries because of two factors. First, entry intensifies competition in the market, and forces some firms to exit. Second, it is observed that many entrepreneurs are likely to overestimate their performance, and could not sustain competitive pressures for a long time period (the so-called “revolving door” hypothesis). We defined entry rate as the share of entrants in total employment, and use its lagged value in the model (*lentrte*).

Firms are likely to stay in the market if the market performs well. We use two measures of market performances, the growth rate of sectoral output (*sectgr*), and the rate of sectoral price inflation (*sectgrpr*). The growth rate of sectoral output is an indicator for current market opportunities, whereas the growth rate of sectoral price index could reflect that supply could not satisfy existing demand, i.e., there are unrealized opportunities in the market. Therefore, these two variables are expected to have a negative impact on exit.

Finally, there are two variables that are related to the structure of the market. The first one is the so-called Herfindahl-Hirschman index (*hhi*) of concentration that is defined as the sum of the squares of the market shares of all firms in the market. The value of the index is equal to one if there is monopoly in the market, and will approach zero if the market is perfectly competitive (if there are a large number of small firms in the market). If the higher levels of concentration in the market make survival more difficult (the competitive pressure argument), we may expect a negative effect of the level of concentration on survival. However, if the oligopolistic firms raise the product price above the competitive level, new firms could find more opportunities to survive in highly concentrated markets. Therefore, the effect of concentration on survival could be ambiguous. The second market structure variable is minimum efficient scale that is defined here as the sectoral median (log) level of firm size in terms of employment (*mes*). The *mes* variable will have a negative coefficient if new firms can find niches for themselves in markets where large firms operate (high *mes*), but find it difficult to compete in markets dominated by similar, small firms (low *mes*).

4.2.2. Econometric results

Cox proportional hazards model estimates are presented in Tables 4.2.1-4.2.2. All models are stratified by 2-digit industries so that each industry at the 2-digit level is permitted to have a different age-dependent baseline hazard function, which is then estimated nonparametrically. All models also include annual dummy variables to take into account the effects of the business cycles and other macroeconomic shocks on survival. The models are estimated for only new firms established in the period under investigation, because our focus is on immediate post-entry performance⁶¹.

61 Since we do not have the data on the year of establishment of the firm in the 1984-2001 dataset, it is not possible to estimate the survival model for all firms.

Tables 4.2.1.

Tables 4.2.2.

There are seven models estimated for each dataset. The first model includes only the *fdi* dummy variable and horizontal and vertical spillover variables. The second model adds changes in sectoral and regional foreign share variables (*cfdiqs* and *cfdiqr*). The sector-specific and firm-specific variables (with the exception of *kl*, *ttrans* and *rddum* variables) are included in the third and fifth models. The fourth model is same as the fifth one, but excludes *cfdiqs* and *cfdiqr* variables. This model is used to check if correlations between *fdiqr* and *cfdiqs* on the one hand, and *fdiqr* and *cfdiqr* on the other have caused any estimation problem. In the sixth mode, we include the capital intensity variable, and finally the last model has all variables including *ttrans* and *rddum*. We added *kl* and *ttrans/rddum* variables separately because there are many missing values for the *kl* variables especially in the 2001-2009 dataset, whereas the *ttrans* and *rddum* variables are available only after 1992 in the 1984-2001 dataset.

There are basically three sets of regressions: the first set includes only foreign firm variables (models 1 and 2). The second set adds sector-specific variables, because these are certainly exogenous to the foreign firm variables (model 3). Finally we add firm-specific variables, some of which could be endogenous (for example, profit margin) (models 4-7).

The estimation results provide strong evidence that foreign firms (*fdi*) have higher survival probabilities than domestic firms when firm-specific variables are not included in the estimation model, i.e., the “foot-loose multinational” hypothesis is rejected by the data. Adding sector-specific variables does not change the degree of impact of foreign ownership on survival. However, when we include firm-specific variables, the coefficient of the foreign-ownership variable, *fdi*, changes its sign and becomes positive and statistically significant for the 1984-2001 dataset. In the case of the 2003-2009 dataset, the coefficient on the *fdi* variable remains negative and statistically significant even after the firm-specific effects are controlled for, but its absolute value declines sharply.

These results indicate that foreign firms are more likely to survive than domestic firms operating in a similar sector, but when we control for firm-specific characteristics, we get a different result. Foreign firms seem to be foot-loose in the late 1980s and 1990s compared to domestic firms that have similar characteristics (same size, same wage rate, same profit margin, etc.). The foreign ownership itself may not have a significant impact on survival, but other firm-level characteristics (size, skill level, etc) are more important. Foreign firms have higher survival probability than domestic firms, not because of their foreign ownership, but because of their characteristics shared by some domestic firms, too. We can conjecture that foreignness does not matter for survival, but multinational experience does because multinational firms start with larger size and could employ more capital-intensive technologies thanks to their superior financial strength and experience in other markets.

Horizontal FDI spillover variables (*fdiqs* and *fdiqr*) have weak and ambiguous impact on survival probabilities. Sectoral share of foreign firms has a positive impact on hazards rate in the 1984-2001 dataset when no sector-specific variables are included. But once these variables are included, its coefficient becomes statistically insignificantly different from zero.

Therefore one cannot rigorously claim that the presence of foreign ownership in the sector reduces the survival probability of domestic firms, because this correlation could be caused by other sector-specific factors. For example, if foreign firms enter mainly to the sectors characterized by high concentration, low growth rates, and low minimum efficient scale, we could observe a similar correlation between sectoral foreign share and survival probability.

Change in the sectoral share of foreign firms (*cfdiqs*, the dynamic effect of the existence of foreign firms) has negative impact on survival of domestic firms in all models, although the effect is statistically significant at the 10% level in some models. Considering these results together with the findings on static effects, one could conjecture that what matters for the survival of domestic firms is the *increasing* sectoral share of foreign firms, not the *level* of foreign presence in the sector. In other words, domestic firms will feel the competitive pressures while foreign firms are increasing their market share (through growth or entry), but the level of foreign share itself does not matter much.

Regional share of foreign firms (*fdiqr*) seems to increase the exit of domestic firms, but only in the 1984-2001 dataset. We do not observe a similar effect in the 2003-2009 dataset. This could also be a result of the differences in policy regimes and macroeconomic conditions during these two periods. Change in regional share of foreign firms (*cfdiqr*) has also a weak and ambiguous effect on survival. The coefficient of the regional foreign share variable (*cfdiqr*) is negative in all models (but statistically significant in only one model) for the 1984-2001 dataset, and negative and significant for the 2003-2009 dataset only when sector-specific variables are not controlled for.

Sector-specific variables usually have strong and consistent effects on survival. Entry rate (*lentrte*) has strong positive impact on the hazard rate. The probability of exit increases when more firms enter into their sector. Growth rates of sectoral output and prices (*sectgr* and *sectgrpr*) help to reduce exit probabilities, and the impact of growth rate of prices is stronger than that of sectoral output. Interestingly, the minimum efficient scale (*mes*) has a positive impact on survival: firms entering into sectors characterized by the existence of large firms are more likely to survive, possibly because they enter into market niches. However, the level of concentration (*hhi*) has statistically significant but opposite effect on survival in 1984-2001 and 2003-2009 dataset. The level of concentration increases the exit probability in the first period whereas it reduces the exit probability in the second period. The change in the effect of concentration could also be explained by changes in the macroeconomic conditions. Survival could be more difficult for small firms in more concentrated markets under the conditions of economic turbulence and high inflation of the 1990s, but small firms could benefit from higher prices in more concentrated markets under economic stability and rapidly declining inflation rates in the 2000s. This is an issue that needs further investigation.⁶²

Firm-specific variables have also strong and consistent impact on survival probabilities. As found in almost all empirical studies on survival, firm size (*relsize*) is very important: large firms are more likely to survive. This finding is robust to using various size measures (relative size, absolute size, entry size, etc.). Capital intensity (*kl*) too has a strong and consistent impact on survival: firms using more capital-intensive technologies are more likely to survive.

⁶²There is also a major change in the way the Herfindahl-Hirschman indices are calculated for these time periods. The statistical unit is “establishment” in the 1984-2001 dataset whereas it is “enterprise” in the 2003-2009 dataset.

The skill level of the workforce, as measured by wage rate (lw), has a strong positive impact on survival in the first database, but its effect is not statistically significant in the second time period. Profit margin ($pmargin$) has also a positive impact on survival although it is statistically significant only in the 2003-2009 period.

Subcontracting is also one of the main determinants of survival. Subcontractors ($suboutput$) are more likely to exit. This result indicates that subcontracting, on average, could be an unequal relationship between subcontractors and main contractors through which risks and costs are transferred to subcontractors. However, subcontracting production does not help to raise survival probability of main contractors. The coefficient on $suboutput$ is very high. It is important to note that since 2003 subcontracting has been widely utilized by manufacturing firms as a means of procuring services.

Technology variables reveal an interesting strong and consistent pattern. Those firms that rely on technology transfer from abroad ($ttrans$) are *less likely* to survive whereas those firms that develop their own technology ($rddum$) through in-house R&D activities are more likely to survive.⁶³ It seems that Turkish firms transfer labor-saving (process) technologies from abroad through license and know-how agreements, whereas the technologies they develop in-house through R&D are labor-using (product) technologies. Thus, those firms that use transferred technology employ less labor, and those firms that conduct R&D employ more labor.

4.2.3. Conclusions

The results of the Cox proportional hazards model suggest that foreign firms are more likely to survive than domestic firms, but the difference between domestic and foreign firms could be explained to a large extent by their firm-specific characteristics. Once firm-specific characteristics are controlled for, it is ambiguous if foreign firms can survive more or if they are foot-loose. It seems that foreign firms have advantages over domestic firms not because they are foreign, but they are multinational. It is also possible that foreign firms decided to quit the Turkish market in the face of higher volatility in large proportions compared to domestic ones.

Foreign spillover variables have usually weak and ambiguous impact on survival probabilities. This is partly due to the limitation of spillover measures we use. Horizontal spillovers are calculated at the 4-digit sector level, and vertical spillovers are calculated using input-output tables. The sectoral classification of input-output tables is even much broader than 4-digit industry classifications used to calculate horizontal spillovers (ISIC and NACE classifications at 4-digit level). Since spillovers are not measured at the firm level, the variation in the data is quite restricted and this could lead to weak and ambiguous results.

Given the data restrictions, the estimation results suggest that there is a negative correlation between sectoral share of foreign firms and survival probability, but this correlation could be caused by other sector-specific factors (level of concentration, sectoral growth rates, etc.).

⁶³The coefficient of the $rddum$ variable is negative in both time periods, but statistically significant only for the 1984-2001 dataset.

Regarding horizontal spillovers, there is weak evidence that imply that change in the sectoral share of foreign firms (the dynamic effect of the existence of foreign firms) has a negative impact on survival of domestic firms in all. Domestic firms feel the competitive pressures while foreign firms are increasing their market share (through growth or entry), but the level of foreign share itself does not matter much.

4.3. Foreign ownership and firm growth

The determinants of firm growth have attracted the attention of economists and policy makers for a long time because growing firms play an increasingly important role in the job creation process. We will analyze the effects of foreign ownership and the presence of foreign firms on growth process.

4.3.1. Empirical Model

The determinants of firm growth have attracted the attention of economists and policy makers for a long time because growing firms play an increasingly important role in the job creation process. In this part of the report, we will analyze the effects of foreign ownership and the presence of foreign firms on growth process.

A simple econometric model of firm growth can be defined by

$$lgr_{it+1} = X_{it}\beta \quad [11]$$

where lgr_{it+1} is the growth rate of firm i from time t to $t+1$, X is a vector of variables and β the corresponding vector of parameters. The growth rate can be defined in logarithmic form:

$$lgr_{it+1} = \log(L_{t+1}/L_t) = \log(L_{t+1}) - \log(L_t) \quad [12]$$

where L is a size variable (we use the number of employees to measure the size of the firm).

One of the main variables included in the firm growth models is the current size of the firm. The relationship between growth and current size has been studied extensively at least since Gibrat's influential study published in 1931. Gibrat suggested that the size of a firm and its growth rate are independent (the "Gibrat law"), i.e., the coefficient of the size variable in the firm growth model should be equal to zero. There are a large number of empirical studies that tested the Gibrat law, but the results are quite mixed. In this study, we also include the current size into the model to check if there is any impact of current size on the growth rate. The model then becomes

$$lgr_{it+1} = \log(L_{t+1}) - \log(L_t) = \beta_0 \log(L_t) + X_{it}\beta \quad [13]$$

This equation is the same as standard empirical labor demand equation that is defined by

$$\log(L_{t+1}) = \alpha_0 \log(L_t) + X_{it}\beta \quad [14]$$

$$\text{where } \alpha_0 = (1 + \beta_0) \quad [15]$$

The growth model (or, similarly, the labor demand model) can be estimated by GMM-system method developed by Blundell and Bond. The GMM-system method takes into account unobserved firm-specific effects and the endogeneity of the lagged dependent variable ($\log(L_t)$) in the model. The main limitation of the GMM-system method in our context is the fact that there could be attrition bias because some firms exit from the market through a process, which is not necessarily random. Therefore, we experimented with the Heckman selection model to take into account the selection (attrition) bias.

The Heckman model is based on estimating two equations, the first one is the selection model (the determinants of survival), and the second one is the growth model that includes a selectivity-bias correction term derived from the estimates of the selection model. Since the selectivity-bias correction term is a nonlinear transformation of the explanatory variables, it is possible to identify the parameters without any further restrictions on the model, in particular without the necessity of adding more exogenous variables into the selection model. However, in many practical applications, if the selection model does not include some additional exogenous variables, the growth model could suffer from multicollinearity problem because the selection correction term could be almost linear. In other words, the Heckman model could be a viable alternative if one can find some exogenous variables that affect selection but not growth. Unfortunately, it is neither theoretically nor empirically easy to find such variables. We experimented with using relative size in the selection (survival) equation, and absolute size in the growth regression, but the results seem not so reasonable (see Tables 4.3.1). Therefore, we focus our attention in this study on GMM-system results.

Tab. 4.3.1.

As mentioned before, the dependent variable of the growth model is the log number of employees at time $t+1$. All explanatory variables used in the Cox proportional hazards model are also used in the growth model with two exceptions. First, we use absolute log size instead of relative size in the growth model. Second, we add (log) age of the firm into the model because young firms are likely to grow faster.⁶⁴ The effects of explanatory variables on growth are expected to be similar to those discussed in the case of survival model with two exceptions. Firm size is expected to have a positive impact on survival but it could have a negative impact on growth (that means, the coefficient of current size variables is expected to be less than one) if small firms grow faster. Likewise, the age of the firm could have a positive impact on the hazard rate for exit (young firms have a higher exit probability than mature firms), but its impact on growth could be negative (young firms are likely to grow faster).

⁶⁴Note that the Cox proportional hazard model also includes the age of the firm in the nonparametric part (baseline hazard function).

4.3.2. Econometric results

GMM-system estimation results for the growth model are presented in Tables 4.3.2 and 4.3.3.⁶⁵ As expected, the coefficient of current size variable (*llab*) is positive but less than one, adding another evidence in support of the stylized fact that large firms have lower growth rates than small firms. However, the coefficient gets closer to one as other firm-specific variables are included in the model. In other words, the impact of the firm size on growth rates declines when firm-specific variables are included in the model.

Tab. 4.3.2.

Tab. 4.3.3.

Foreign ownership has a strong impact on growth. The coefficient of the foreign ownership dummy (*fdi*) has a positive and statistically significant coefficient in all but one model. Although foreign firms start larger than domestic entrants, they achieve faster growth rates than comparable domestic firms.

Two foreign spillover variables have strong and rather consistent impact on growth rates. First, the share of foreign firms in supplier industries (*fdisupp_q*) has a negative impact on buyer firms. It seems that buying inputs from local foreign firms has a detrimental effect on the growth prospects of domestic firms. Moreover, the change in regional share of foreign firms (*cfdiqr*) has also a negative impact on growth. Firms located in regions where the share of foreign firms increase rapidly are faced with some restrictions on growth. This could be due to the allocation of local resources towards foreign firms. Other spillover variables have either weak or ambiguous effect on growth.

Other sector-specific variables have usually strong impact on the growth rates of firms. Firms operating in sectors that experience high growth rates in output (*sectgr*) and prices (*sectgrpr*) also grow faster (“riding on the wave” effect). Firm growth rates are lower in more concentrated sectors (*hhi*). The lack of competition has a negative impact on the growth rates of firms. However, firms tend to grow faster in sectors characterized by high minimum efficient scale (*mes*). This could be due to the need to reach minimum efficient scale sooner to be competitive in the market. Entry rate (*lentrte*) has an ambiguous effect. Its impact on growth is positive in the 1984-2001 dataset, but negative in the 2003-2009 dataset. New firms are likely to enter in boom years and exit during the bust years, which happened to be more frequent during the 1984-2001 period.

Firm-specific variables have expected effects. Mature firms have lower growth rates (*lage*), whereas firms paying higher wages (presumably to their more skilled workers) (*lw*) grow faster. Capital-intensive (*kl*) firms tend to grow faster possibly because of the complementarities between capital and skilled labor. Profitable firms (*pmargin*) also achieve faster growth. This result suggests that there could be external financial constraints on firm growth. Those firms that accumulate capital are able to finance their growth. Subcontracting variables support the hypothesis on unequal relationship between subcontractors and main

⁶⁵All models include time dummies to control for macroeconomic conditions.

contractors. Subcontractors (*suboutput*) have lower growth rates but contracting out production (*subinput*) increases growth rates for main contractors (but the last effect is not statistically significant in the 2003-2009 period).

Technologically more dynamic firms achieve higher growth rates. Firms transferring technology from abroad (*ttrans*) and conducting in-house R&D (*rddum*) grow faster than others. These variables have positive but statistically insignificant coefficients for the 2003-2009 dataset, possible because the panel is short for that dataset and unobserved firm-specific effects dominate the contribution of *ttrans* and *rddum* variables that do not change much over time.

4.3.3. Conclusions

Estimation results for the growth model suggest strongly that foreign firms have higher growth rates than domestic firms, even after controlling for a number of firm-specific variables, including unobserved firm-specific factors. The presence of foreign firms has a detrimental impact on the growth rate of domestic firms that either use more inputs from foreign-dominated sectors, or operate in regions where the share of foreign firms in regional output is increasing. The first case, foreign presence in supplier industries has also a negative impact on the survival of domestic firms purchasing inputs from foreign firms. This is an unexpected result, because it can be argued that foreign firms could produce higher quality products or sell their products at a lower price thanks to their productivity, so that their corporate customers should benefit from using inputs produced by foreign firms, and achieve faster growth and survive longer.

5. Impact of FDI on domestic firms' survival and growth: main findings

Concerning the issue of how the presence of FAs affects the domestic firms' survival and employment growth, our findings suggest that there is a huge degree of heterogeneity among the two countries and across firms, period and sectors.

In the case of Italy, the survival of domestic firms is positively affected by the increased presence of foreign firms within the same industry, but this only occurs in low- and medium-low tech industries. This result may be due to the fact that domestic firms in medium-high tech industries have not enough absorptive capacity to benefit from FDI spillovers. The relevance of domestic firms' absorptive capacity for spillover effects is confirmed by our analysis: only **domestic firms that have smaller technology gap vis-à-vis the foreign firms** benefit from **significant horizontal and vertical (upstream) spillovers on survival**. Hence, **being a customer of foreign companies has a beneficial effect on local firms' with higher productivity**, that is the **Italian companies are able to improve themselves once they are offered products and services from MNEs from upstream sectors**. These findings point to a sensible economic interpretations. Foreign firms in the upstream sectors probably supply better quality products at lower costs, as well as providing support to local companies in the form of training and supply of equipment. On the contrary, if foreign firms act as customers of Italian local firms the chance of getting spillovers might be weaker for several reasons: foreign firms have a strong bargaining power, the ability to diversify their supply network and to impose low prices on their suppliers, and hence to be quite selective on them. However, the **net effect of foreign firms on domestic establishments' survival also depends crucially on the technological capacity of domestic**

firms: only in the group of firms with a low technology gap with respect to foreign firms (high absorptive capacity) we find positive and significant horizontal and vertical (upstream) spillovers on survival. Hence, our analysis confirms that the level of technological gap matters considerably for spillovers: **only domestic firms with at least a basic level of technology are enabled to adapt to better technologies.** We might argue that, when the technological gap is high the inputs and the output produced locally by foreign firms can be more expensive and less adapted to local requirements as foreign firms are too technologically advanced compared to local enterprises.

Turning to the analysis of firm growth, from the **system GMM growth estimates** we find that in Italy **foreign firms do not have higher growth rates than domestic firms** and, in terms of FDI spillover, there is evidence of a **negative impact on domestic firms employment growth if the foreign firm share in the region employment increases.** Also **foreign competition in the same sector pushes domestic firms out of market if they have a high productivity gap.**

For **Turkey**, the estimation results suggest that regarding horizontal spillovers, there is weak evidence in favor of negative dynamic effects of the existence of foreign firms on survival of domestic firms. While the level of foreign share in the sector itself does not have an impact on their survival, however, **domestic firms feel the competitive pressures while the market share of foreign firms is increasing.**

The regional share of foreign firms has a negative static impact on the survival rate, and an increase in the share of foreign firms in a sector also has a negative impact on the survival rate in the 2003-2009 period. The foreign share in downstream firms has negative effect on firm survival, i.e., **domestic firms will be less likely to survive if purchasers of their output are from sectors with high foreign presence**, but this results is statistically significant only in the 2003-2009 period.

Estimation results for the growth model strongly suggest that foreign firms have higher growth rates than domestic firms, even after controlling for a number of firm-specific variables, including unobserved firm-specific factors. There is also **a weak negative impact of sectoral foreign share on growth** whereas a weak positive impact is observed for the change in sectoral foreign share. Besides, **the presence of foreign firms has a detrimental impact on the growth rate of domestic firms that either use more inputs from foreign-dominated sectors, or operate in regions where the share of foreign firms in regional output is increasing.** The first case, foreign presence in supplier industries has also a negative impact on the survival of domestic firms purchasing inputs from foreign firms. This is an unexpected result, because it can be argued that foreign firms could produce higher quality products or sell their products at a lower price thanks to their productivity, so that their corporate customers should benefit from using inputs produced by foreign firms, and achieve faster growth and survive longer.

6. Conclusions and policy recommendations

This paper was aimed at investigating the spillover effects from foreign-owned to domestic firms survival and growth. The research was expected to contribute to the existing literature on FDI by presenting new evidence on whether foreign ownership plays direct and indirect role on the firm survival and growth in the Turkish and Italian manufacturing industry. This

topic of research has strong relevance to policy given that incentives to FDI and enterprise survival are essential targets of industrial policies. Firms shutdowns play a major role in the dynamics of employment and industrial restructuring. Besides, firm's birth and death contribute to industry productivity growth and shape industry competition. Firm exit is the end point of its life cycle, by ceasing production and displacing workers, firm death/survival directly affects the dynamics of the industry and workers' welfare. Therefore, how indigenous firms adjust to the presence of FDI is of great interests to both policy makers and academic.

Our results are not straightforward across the two countries, and across periods and sectors. However, they suggest that **foreign investment are likely to influence both the quantity and the quality of domestic entrepreneurship**. The negative influence on firm survival is likely to be small in current economic terms but could be potentially bigger over a longer term horizon.

Although our results cannot be generalized across countries, periods and sectors, overall, they help us reach **a set of conclusions**.

- **FDI influence the quantity of domestic entrepreneurship both in terms of extensive margin (number of firms) and of intensive margin (output and employment growth).**
- **Our results do not support the broad conclusion that FDI have a positive impact on firms' indigenous survival and growth dynamics. Conversely, they provide an unfavorable picture in terms of the balance between displacement/competition versus spillover effects of FDI on domestic firms. The net effect of foreign firms on domestic establishments' survival crucially depends on the technological gap, i.e. on the absorptive capacity of domestic firms. Positive externalities only arise when certain conditions are met regarding the quality/competitiveness of local input suppliers and customers.** If this is not the case, foreign firms may be relatively self-sufficient and collaborate little with local firms (foreign firm 'enclaves'). Under these circumstances, downstream foreign firms might come with fully integrated upstream supply, or upstream foreign firms with fully integrated downstream distribution.
- **Our study also highlights the role of high versus low technology intensity. The displacement impact of foreign competition on domestic firms' survival tends to be higher in high-tech industries compared to low-tech industries** due to the higher concentration, more fierce competition and stronger market share/control which characterise more technology intensive sectors. In terms of industrial policy, this implies that the **desire to encourage FDI and simultaneously building up a stable supply of indigenous enterprises is more challenging in dynamic markets**, where a trade-off in terms of these objectives might exist.

To sum up, **the impact of FDI on domestic firms is conditional upon some critical features of the host economy and of sectors and firms.**

In terms of policy, the following implications and recommendations may be drawn:

- **Policies aimed at increasing firm survival rates hence need to be calibrated taking into account differences in the capacity of firms to survive and to adopt and develop new foreign technologies. Industrial policy should target firm-**

specific characteristics that are crucial determinants of performance gaps in survival and in firm absorptive capacity: primarily firm size, productivity, innovation and multinational activities.

- As we find that **the displacement effect is concentrated on high-tech firms, in terms of industrial policy, the target of attracting foreign investment in strategic technology intensive sectors should be combined with the target of developing “domestic” strategic sectors. Technology, innovation and knowledge diffusion are specific complementary policy measures needed for benefitting from FDI spillovers.**
- **Fair market competition policy enforcement and reforms of the institutional setting** also appear crucial. The contrast between the experiences of Turkey in the pre-2002 and post-2002 period, in which Turkey experienced two different policy and growth regimes, highlight **the importance of the institutional setting for firm survival and growth.** Hence, the policy oriented perspective depends on several factors: certainty of the legal environment, sector of specialisation, consideration of domestic markets features. **Subsidies and various measures of attraction are conditional on the presence of market imfections and on failure of market mechanisms able to select the better and faster growing enterprises and to building a business system able to attract stable foreign competitors.**

On the ground of policy recommendations, these considerations should help policy makers to target specific sectors and priorities and hence on selecting and conditioning FMNE entry. Policies aimed at increasing firm survival and at attracting more stable FDI should be calibrated according to the sectors involved, due to different sensitivity to industrial policies according to firm technology capacity and to technology environment. Hence, these considerations should help policy to target specific sectors and priorities and hence upon conditioning the FMNE entry. **The widespread diffusion of general attraction incentives for FDI as policy instruments is unfortunate.** Policy makers need to be able to disentangle the drivers of higher domestic firms survival chances and business growth: **local firm features in the host country, firm technological capability, sectors to be targeted, and local conditions need to be carefully examined.** This is crucial to enhance spillover effects and to avoid competition/crowding out.

Italy and Turkey were two excellent case studies for analyzing to what extent FDI contributes to firm survival, an issue which has received not much attention with respect to other topics related to FDI. Hence, this project was expected to fill a gap in the literature. The studies on the effects of MNEs on domestic firms survival are still poor both with respect to these two countries and to the whole Mediterranean region.

Our results for Turkey and Italy are of pivotal importance for the whole Mediterranean region for several reasons. We may consider the countries under investigation as quite representative of the South Mediterranean region in terms of the dynamic of inward FDI over recent years and of their potential consequences on firm structure. Turkey and Italy share many similarity with the countries within the Mediterranean region: an increasing role of FDI as a source of investment, large presence of take overs, mainly of public firms by privatizations but also, more recently, of private domestic enterprises, production systems structure strongly biased towards small and medium enterprises, large presence of micro firms belonging to the large informal sector, high rate of firm mortality, low ability to compete with foreign investors and to compete on foreign markets, only limited access to external capital, scarce propensity to

innovate, relevant technological gap with respect to foreign firms that may affect the capacity of firms to exploit technological spillovers from MNEs. The large presence of micro and small firms makes Italy and Turkey an interesting case for analysing the hypothesis according to which small enterprises are hampered in their ability to absorb new technology from inward FDI-related spillovers because of a lack of scientific and technical staff or experience. The firm structure is certainly reducing on the one hand the attractiveness for foreign investors, especially of long term and productive investment, on the other hand, it affects the ability of domestic firms to compete successfully with foreign investors. Therefore, FDI is a potential factor of increase of the already high rate of firm mortality. The small size of firms implies the difficulty of meeting the up-front cost of R&D with only limited access to external capital. The scarce propensity to innovate may suggest the presence of a relevant technological gap with respect to foreign firms that may affect the capacity of firms to exploit technological spillovers from MNEs. Therefore the Italian and the Turkish economy are two interesting case-studies in order to test the effects of inward FDI-related spillovers from MNEs on the absorptive capacity of domestic firms. This is quite relevant to make our results easy to be generalised. Hence, the investigation of this topic for Italy and Turkey might have an important value added for further research on the impact of FDI on South Mediterranean countries providing us with a benchmark for future research on the region.

Tab. 5.1. Overview table

Research questions	Methodology	Main literature	Results for Italy	Results for Turkey	Conclusions	Policy implications & measures
Test the effects of FDI on domestic firms survival and growth disentangling horizontal and vertical spillovers (presence of foreign multinationals in the same sectors or in upstream and downstream industries as input suppliers and customers). Spillover effects or competition/displacement?	Hazard models, GMM system estimates, Heckman selection model.	Caves, 1974; Blomström and Sjöholm, 1998; Görg and Strobl, 2003; De Backer and Sleuwaegen, 2003; Burke, Görg and Hanley, 2008; Girma and Gong, 2008; Bandick, 2010; Wang, 2010; Kosovà, 2010.	-No evidence of significant horizontal and vertical spillovers on survival and on growth. -Foreign firms do not have higher growth rates than domestic firms.	-A higher regional share of foreign firms and an increase in the share of foreign firms in a sector have a negative impact on survival in the 2003-2009 period. - Negative effect on survival if downstream firms are foreign.	FDI influence the quantity of domestic entrepreneurship both in terms of extensive margin (number of firms) and of intensive margin (output and employment growth). But no clearcut evidence that FDI have a positive impact on firms' indigenous survival and growth dynamics.	-Target firm-specific characteristics crucial determinants of performance gaps in survival and growth: firm size, productivity, innovation and multinational activities. -Fair market competition policy enforcement.
Test for the firm absorptive capacity: how the impact of FAs on domestic firms survival and growth varies with technology gap between domestic and foreign firms?	Hazard models, GMM system estimates, Heckman selection model applied to high and low technology gap subsamples of firms.	Studies on FDI spillovers on productivity : Findlay, 1978, Wang and Blomstrom, 1992; Glass and Saggi, 1998; Jabbour and Mucchielli, 2007; Jordaán, 2008.	-Domestic firms that have smaller technology gap vis-à-vis foreign firms benefit from significant horizontal and vertical (upstream) spillovers on survival. -A higher technology gap with respect to foreign firms is found in medium and high tech industries. -Negative impact on domestic firms employment growth if the foreign firm employment share in the sector and in the region increases and if domestic firms have a high technology gap with respect to foreign firms.		The net effect of foreign firms on domestic establishments' survival crucially depends on the technological gap, i.e. on the absorptive capacity of domestic firms. Positive externalities only arise when certain conditions are met regarding the quality/competitiveness of local input suppliers and customers.	-Detect the drivers of higher domestic firms survival chances and business growth: local firm features in the host country, firm technological capability, sectors to be targeted. -No general attraction incentives for FDI. Subsidies and various measures of attraction conditional on market imperfections and on failure of market mechanisms able to select the better and faster growing enterprises.

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<p>How the impact of FAs on domestic firms survival and growth varies with the technological intensity of production?</p>	<p>Hazard models, GMM system estimates, Heckman selection model applied to the two subsamples of firms belonging to high and low technology industries.</p>	<p>Görg and Strobl, 2003; De Backer and Sleuwaegen, 2003; Burke, Görg and Hanley, 2008.</p>	<p>- In low- and medium-tech industries the survival of domestic firms is positively affected by the increased presence of foreign firms within the same industry -Domestic firms in medium-high tech industries have not enough absorptive capacity to benefit from FDI spillovers.</p>		<p>Crucial role of knowledge intensity versus low technology intensity. The displacement impact of foreign competition on domestic firms' survival tends to be higher in high-tech industries compared to low-tech ones due to the higher technology gap and to more fierce competition and stronger market share/control which characterise more technology intensive sectors.</p>	<p>Technology, innovation and knowledge diffusion as specific complementary policy measures.</p>
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Appendix: Tables and Figures

Tab. 2.3.1. Microeconometric studies on the impact of FDI on firm survival

Country/Author(s)/Year of publication	Period covered	Topics investigated	Methods used	Important findings
Ireland Gorg and Strobl (2003)	1973-1996	Effect of the presence of multinationals on survival of indigenous and foreign plants	Cox proportional hazard model estimates	Positive spillover effects rather than competition/crowding out for plants in high tech industries.
Belgium De Backer and Sleuwaegen (2003)	1990-1995	Effect of the presence of multinationals on firm entry and exit across Belgian manufacturing industries	Cox proportional hazard model estimates	In the short run: foreign direct investment discourage entry and stimulate exit of domestic entrepreneurs. However, evidence of structural effects of FDI fostering domestic entrepreneurship due to learning, demonstration, networking and linkages effects.
UK Burke, Görg and Hanley (2008)	1997-2002	Impact of foreign presence (share of employment by MNCs at the industry level) on the survival of business start ups in U.K.	Cox proportional hazard model estimates	A negative effect of foreign presence on survival of firms in dynamic industries, a net positive effect in static industries.
Sweden Bandick (2010)	1993-2002	Impact of foreign presence (share of employment by MNCs at the industry level) disentangling domestic MNEs, export active plants and purely domestic plants.	Cox proportional hazard model estimates	Negative effects on the survival of purely domestic firms while does not impact on the exit rate of Swedish MNEs and Swedish non multinational exporting plants.
Czech R. Kosová (2010),	1994-2001	Impact of foreign presence (share of employment by MNCs at the industry level) on growth and survival of domestic firms	Both continuous models (parametric log-normal model, non parametric Cox model) and discrete method: probit.	Evidence of both technology spillovers and crowding out as a short term phenomenon: growing foreign saler increase domestic firms survival and growth especially in technologically advanced industries are the main beneficiaries of technology spillovers.
Girma and Gong (2008)	1999-2005	FDI competition to Chinese state-owned enterprises (SOEs)	Cox proportional hazard model estimates.	Deleterious impact on growth and survival probability of SOEs, export-oriented FDI in downstream sectors have negative spillovers on performance while there are no discernible spillover effects from FDI in upstream sectors.
Wang (2010)	1973-1997	Canadian indigenous plants' survival though their economic linkages with FDI affiliates as competitors, input suppliers and customers.	Log normal accelerated failure time model	Indigenous plants tend to have shorter lives due to competition with FDI affiliates operating in the same industry, but benefit from FDI affiliates operating both in upstream and downstream industries as input suppliers and customers.

Fig. 3.1.1. Italy and Turkey: inward FDI flows (1990-2011, billion USD)

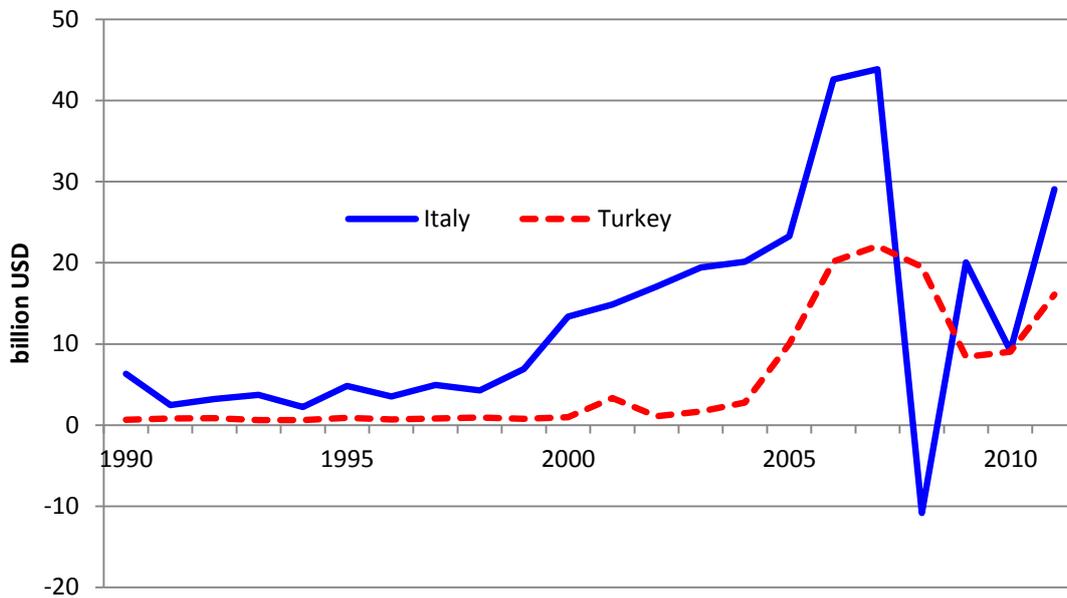
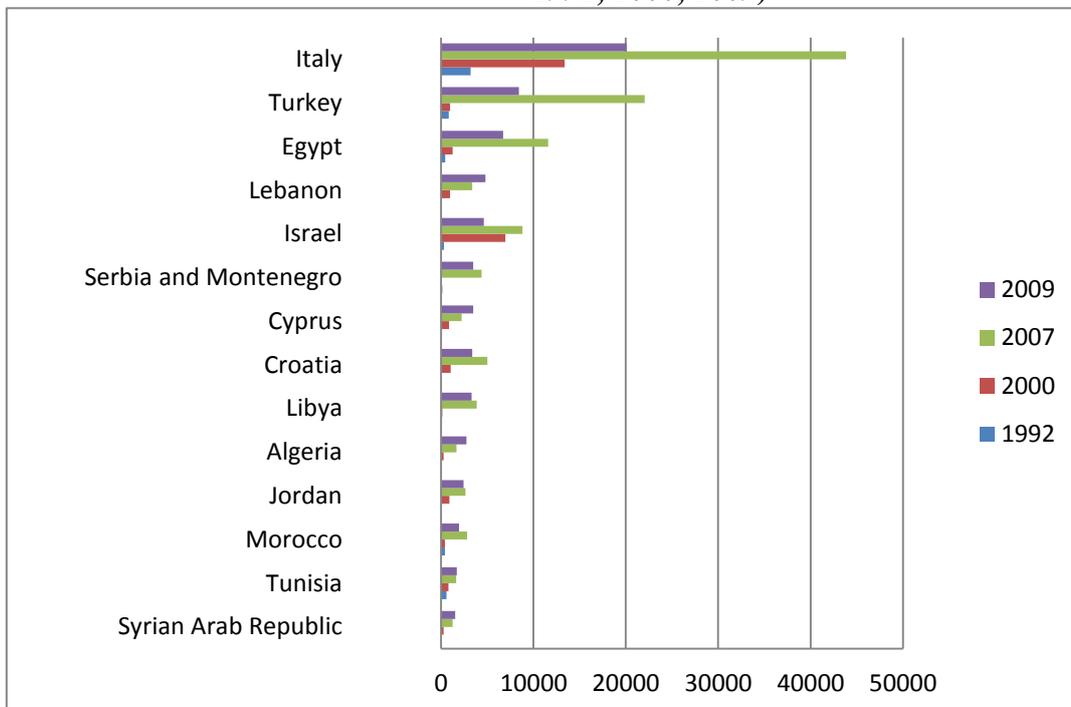


Fig. 3.1.2. Inward FDI in Italy, Turkey and selected Mediterranean countries (millions USD; 1992, 2000, 2009)



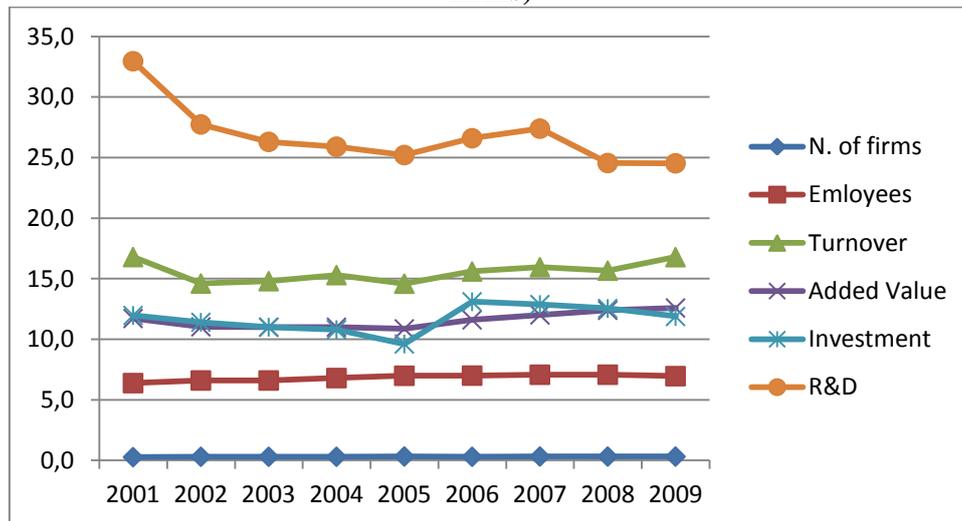
Fonte: UNCTAD, World Investment Report.

Tab. 3.1.1. Foreign owned firms in Italy: main indicators (2001 -2009)

	N. of firms	Employees	Turnover (mln Euro)	Added Value (mln Euro)	Investment (mln Euro)	R&D (mln Euro)
2001	11,396	1,003,693	364,787	64,931	12,566	2,195
2002	11,905	1,047,697	333,021	63,327	12,139	1,957
2003	14,125	1,074,662	343,301	63,146	11,980	1,834
2004	13,951	1,115,894	383,304	66,516	11,591	1,885
2005	14,012	1,175,235	386,868	67,522	10,310	1,980
2006	14,281	1,206,089	447,192	78,625	15,428	2,186
2007	14,401	1,246,794	472,420	86,401	16,132	2,590
2008	14,375	1,266,789	489,281	88,451	16,566	2,497
2009	14,155	1,221,962	444,544	79,298	13,715	2,511

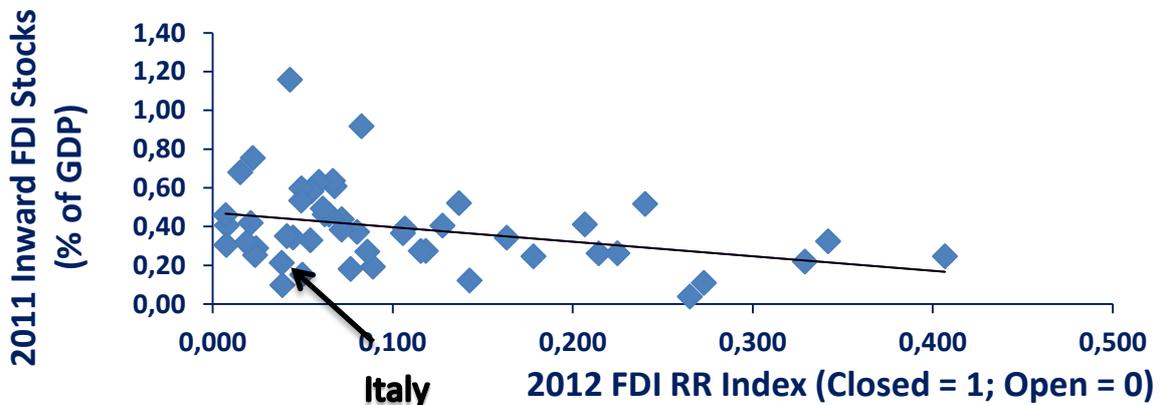
Source: ISTAT, Indagine sulle imprese a controllo estero in Italia

Fig. 3.1.3. Foreign owned firms in Italy: main indicators (2001-2009; in percentage of total firms)



Source: ISTAT, Indagine sulle imprese a controllo estero in Italia

Figure 3.1.4. Inward FDI Regulatory Restrictiveness and Inward FDI Stock



Sources: OECD Statistics, IMF and Worldbank.

Tab. 3.2.1. Definition of variables, data sources and expected relationships with firm exit (Italian dataset)

Category	Variables	Description	Source	Exp. Sign
FIRM LEVEL COVARIATES				
	SIZE	Firm size measured by the number of employees.	AIDA	-
	RELATIVE SIZE	Firm employment relative to mean employment at 2 digit Ateco level.	AIDA	-
	CLASS41, CLASS42, CLASS43, CLASS44	Dummies for size groups: Class41=small firms (<20), Class42=medium firms (between 20 and 50), Class43= large firms (50-100); Class44=.		+/-
	AGE	Firm age measured by the number of years since establishment.	AIDA	-
	PRODUCTIVITY	Firm productivity measured by value added per employee.	AIDA	-
	CAPINTENSITY	Real capital stock on employees.	AIDA	-
	WAGE	Ratio between total personnel cost and total employment	AIDA	-
FINANCIAL VARIABLES	PROFIT_MARGIN (PTPM)	Firm profits before tax over turnover (%)	AIDA	-
	SOLVENCY_RATIO	Company's post-tax net profit and depreciation divided by the quantity of long-term and short-term liabilities (%) .	AIDA	-
	COLLATERAL	Firm ratio of its tangible assets to its total assets (%.)	AIDA	-
	DEBTS WITH BANKS OVER TURNOVER	Firm short and long term debts with banks over turnover (%).	AIDA	+/-
INTERNATIONALISATION VARIABLES	INWFDI (OWN2)	Foreign ownership dummy that takes on the value 1 if the firm is foreign-owned, 0 otherwise.	AIDA	+/-
	OUTFDI (OWN3)	Domestic multinational ownership dummy that takes on the value 1 if the firm is an Italian owned-MNE, 0 otherwise.	AIDA	+/-
	EXPORT	Dummy variable equal to 1 if the firm exports over the entire period 2002-2009.	MINT-ITALY	+/-
INNOVATION VARIABLES	GAP	Difference between the mean productivity of foreign firms in 2 digit Ateco sectors and the productivity of each firm in the same sector.	AIDA	+/-
	GAP_class	Dummies for two technology gap classes: gap_1=low technology gap firms; gap_2 =high technology gap firms;		+/-
	RAND	R&D intensity defined as the ratio of R&D expenditure on sales	AIDA	+/-
INDUSTRY LEVEL COVARIATES				
FDI LINKAGES	FDI_OWIND	Foreign firms turnover on total sector turnover. Proxy of FDI competitors in the same Ateco 2 digit industries.	EUROSTAT	+/-
	FDI_UP	FDI in upstream industries k which affect plant or firm i in industry j through providing intermediate inputs to industry j.	EUROSTAT AND ISTAT	+/-
	FDI_DOWN	FDI in downstream industries k which affect plant or firm i in industry j through buying intermediate inputs by industry j.	EUROSTAT AND ISTAT	+/-
	FDI_SHARE BY REGION	Rratio between the production of foreign firms to the production of all firms in region r at year t.	AIDA	-
	HIGH FOREIGN	Dummy for firms belonging to sectors with low or high foreign presence and is equal to 1 if the percentage of foreign multinationals turnover over total turnover in the industry exceeds the 50th percentile, 0 otherwise.	AIDA	-
	EXPSHARE	Ratio of 3 digit Ateco 2007 industry j's total exports over total output at year t.	ISTAT	+
	IMPSHARE	Ratio of 3 digit Ateco industry j's total imports over total output at year t.	ISTAT	+
	OUTPUT_GROWTH_	Annual output growth rate by 2 digit Ateco.	ISTAT	+
	ENTRY_RATE	Ratio between the number of firms which enter the business registry and the total number of active firms in industry j at year t.	ISTAT	-
	MES	Minimum efficient scale of the industry measured as the ratio of firms' sales above the average sales for the industry on total industry sales (Comanor and Wilson 1967)	AIDA	+/-
	HERF	Herfindahl index of turnover by 2 digit Ateco, proxy for the level of concentration within the sector.	AIDA	+/-
	LOCATION DUMMY	Dummy =1 if firm located in South of Italy otherwise =0		
	ATECO SECTORS	2 digit Ateco 2002 classification	ISTAT	
	TECH_clas	Technology macrosector dummies (tech_class=1,2) for firms belonging to low, medium-low and to medium high and high technology respectively (OCSE taxonomy)	OCSE	

Tab. 3.2.2. Descriptive statistics (all firms, domestic firms, exporting firms, non exporting firms, foreign multinationals, domestic multinationals, 2007; Italy)

Variables name	ALL FIRMS		DOMESTIC FIRMS		EXPORTING FIRMS		NOT EXPORTING FIRMS		FOREIGN MULTINATIONAL		DOMESTIC MULTINATIONAL	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
FIRM LEVEL COVARIATES												
GROWTH EMPL.	20,18	924,6	20,95	943,67	26,01	1068,82	3,13	120,31	1,61	49,4	15,47	327,86
GROWTH EMPL. LOG SIZE	-0,02	0,33	-0,02	0,32	-0,02	3,40E-01	-0,03	0,29	-0,04	0,38	-0,01	0,35
RELATIVE SIZE	1,08	2,63	1,01	2,52	1,1	2,68	1	2,48	2,77	4,31	3,58	5,44
CLASS 41 (20)	0,18	0,38	0,18	0,39	0,17	0,38	0,18	0,39	0,04	0,19	0,01	0,11
CLASS 42 (20-50)	0,28	0,45	0,29	0,45	0,27	0,44	0,3	0,46	0,1	0,3	0,08	0,27
CLASS 43 (50-100)	0,24	0,43	0,25	0,43	0,25	0,44	0,22	0,41	0,17	0,38	0,15	0,36
CLASS 44 (>100)	0,3	0,46	0,29	0,45	0,3	0,46	0,3	0,46	0,69	0,46	0,76	0,43
AGE	27,6	15,78	27,64	1,57E+01	27,8	15,89	27	15,46	26,45	17,98	30,58	19,12
PRODUCTIVITY	72395,63	1,19E+06	64832,73	4,58E+05	76772,58	1,38E+06	59708,92	39818,33	2,77E+05	5,85E+06	73263,83	91988,35
SOUTH AND ISLAND	0,16	0,37	0,16	3,70E-01	0,16	3,60E-01	0,16	0,37	0,1	0,29	0,06	0,24
CAPINTENSITY	72649,78	8,19E+05	70131,83	7,15E+05	76692,99	9,48E+05	60930,41	96607,39	1,41E+05	2,24E+06	62569,98	1,73E+05
WAGE	38232,49	1,51E+05	37939,05	1,53E+05	38981,55	1,74E+05	36045,54	19845,79	46279,61	19961,82	42720,58	60403,06
PROFIT MARGIN	3	13,42	3,02	13,41	2,95	1,44E+01	3,14	10,16	2,47	13,77	4,3	17,04
SOLVENCY RATIO	30,26	19,7	30,26	19,67	30,35	19,75	29,98	19,55	30,26	20,58	32,91	19,59
COLLATERAL DEBTS WITH BANKS OVER TURNOVER	0,77	0,26	0,77	0,26	0,77	0,26	0,77	0,26	0,72	0,29	0,56	0,28
INWFDI (OWN2)	0,04	0,19	0	0	0,04	0,19	0,04	0,18	1	0	0	0
OUTFDI (OWN3)	0,08	0,27	0,08	0,28	0,08	0,27	0,08	0,27	0	0	1	0
EXPORT	0,74	0,44	0,74	0,44	1	0	0	0	0,75	0,44	0,75	0,43
GAP CLASS HIGH	0,49	0,5	0,5	0,5	0,5	0,5	0,48	0,5	0,38	0,49	0,38	0,49
RAND	0,01	0,14	0,01	0,15	0,01	0,17	0,01	0,03	0	0,01	0,01	0,49
INDUSTRY LEVEL COVARIATES												
FDI_OWIND	0,16	0,12	0,16	0,12	0,17	0,13	0,16	0,12	0,25	0,15	0,18	0,12
FDI_UP	10,58	3,59	10,56	3,58	10,49	3,53	10,83	3,74	11	3,7	10,86	3,31
FDI_DOWN	8,86	2,88	8,83	2,9	8,81	2,87	9,01	2,91	9,68	2,38	9,11	2,79
FDI SHARE BY REGION	0,12	0,1	0,12	0,1	0,12	0,1	0,12	0,1	0,16	0,1	0,12	0,08
EXPSHARE	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
IMPSHARE	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01
OUTPUT GROWTH_	-0,03	0,09	-0,03	0,09	-0,03	0,09	-0,03	0,09	-0,04	0,1	-0,02	0,09
ENTRY RATE	3,99	1,49	4,02	1,49	3,99	1,49	4,01	1,49	3,32	1,42	3,99	1,43
MES	0,77	0,04	0,77	0,04	0,77	0,04	0,77	0,04	0,79	0,04	0,77	0,04
HERF	0	0,01	0	0,01	0	0,01	0	0,01	0	0,02	0	0,02
TECH CLASS LOW	0,7	0,46	0,71	0,46	0,7	0,46	0,7	0,46	0,42	0,49	0,54	0,5
N. OBSERVATIONS	23859		23010		17739		6120		849		1900	

Source: Own elaborations.

Fig. 3.2.1. Italian firms : Kaplan-Meier survival estimate

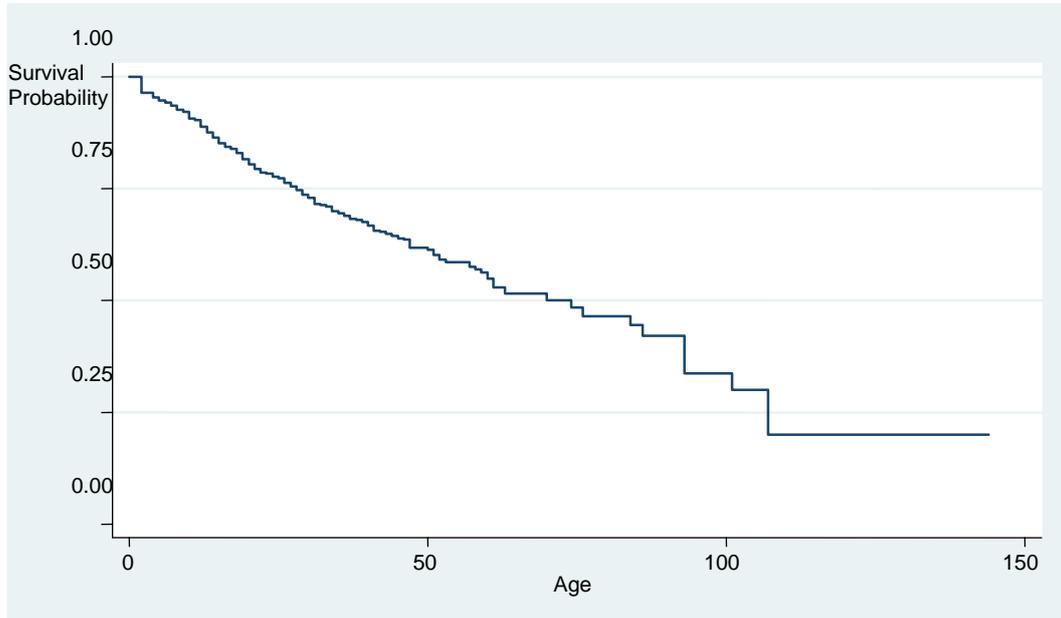


Fig. 3.2.2. Italian firms: Kernel density estimates

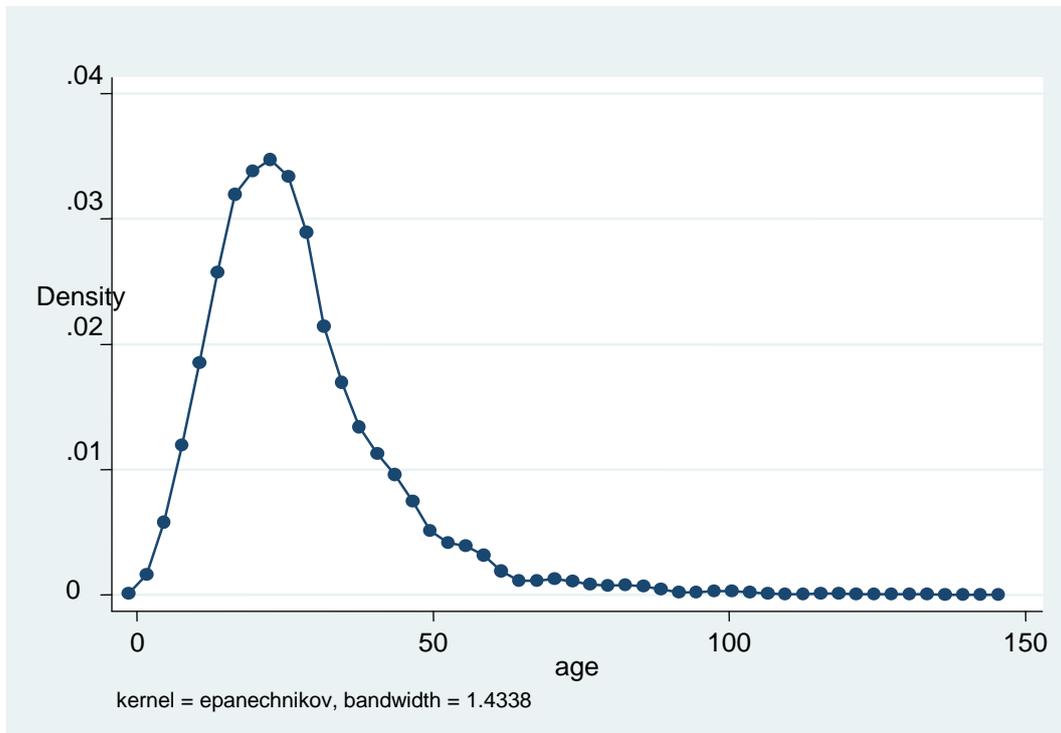


Fig. 3.2.3. Italian firms: Kaplan-Meier survival estimates by technology clusters

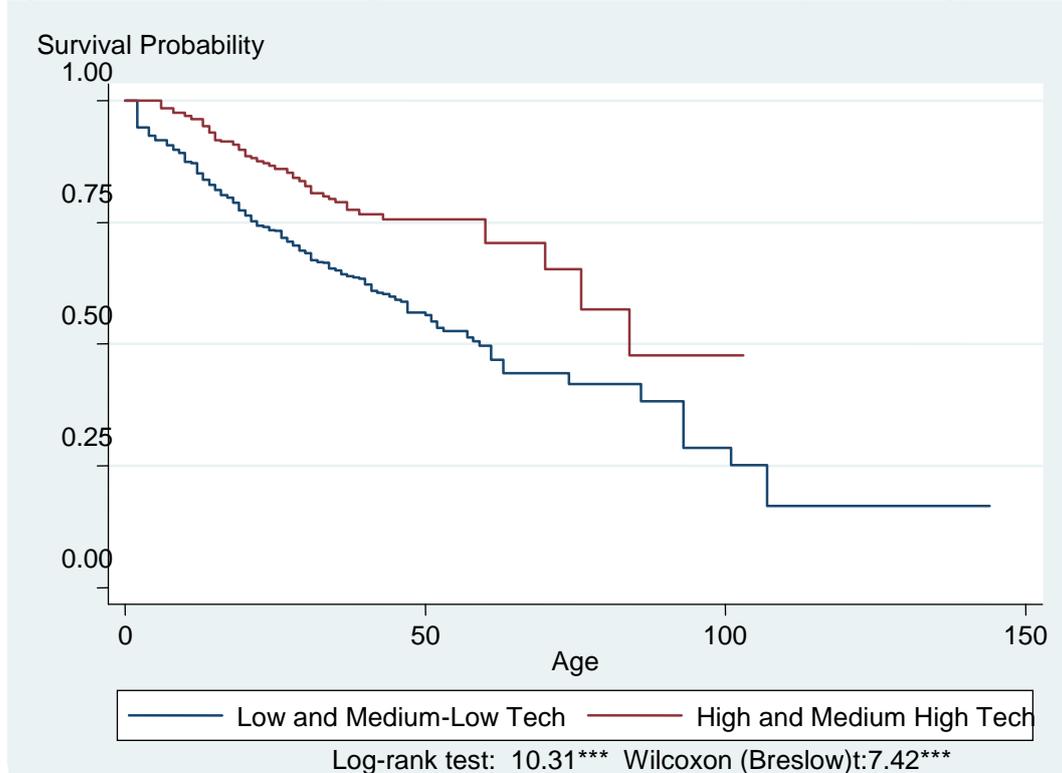


Fig. 3.2.4. Italian firms: Kaplan-Meier survival estimates by ownership

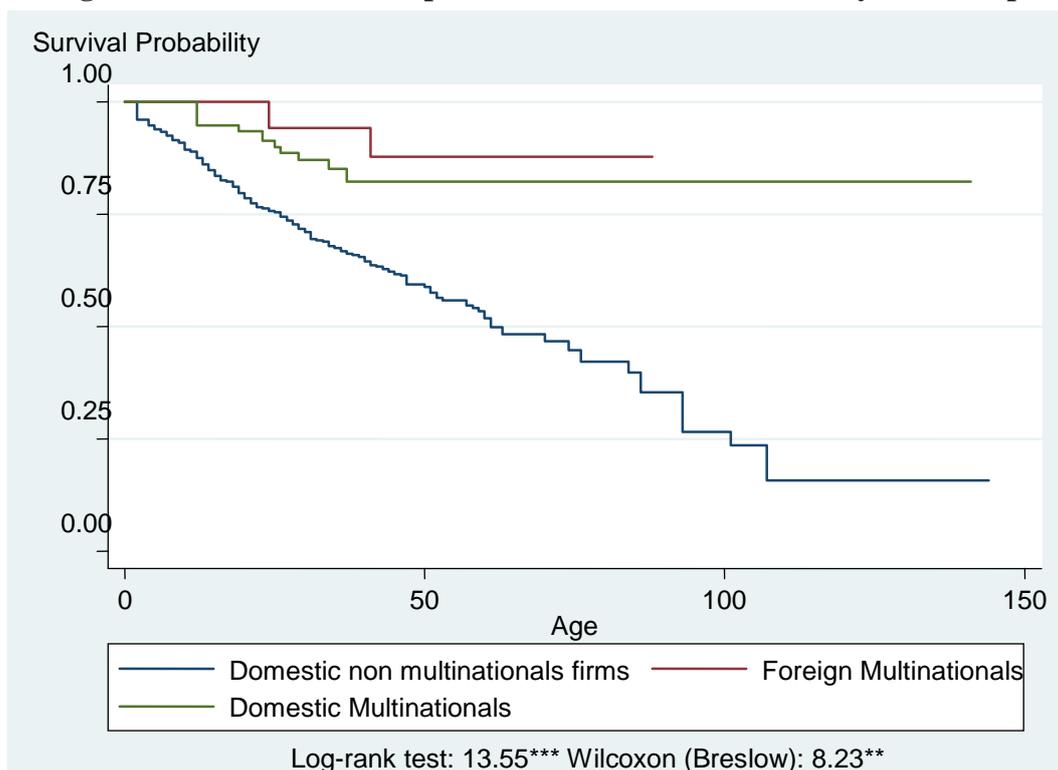


Fig. 3.2.5. Italian firms: Kaplan-Meier survival estimates by foreign investment

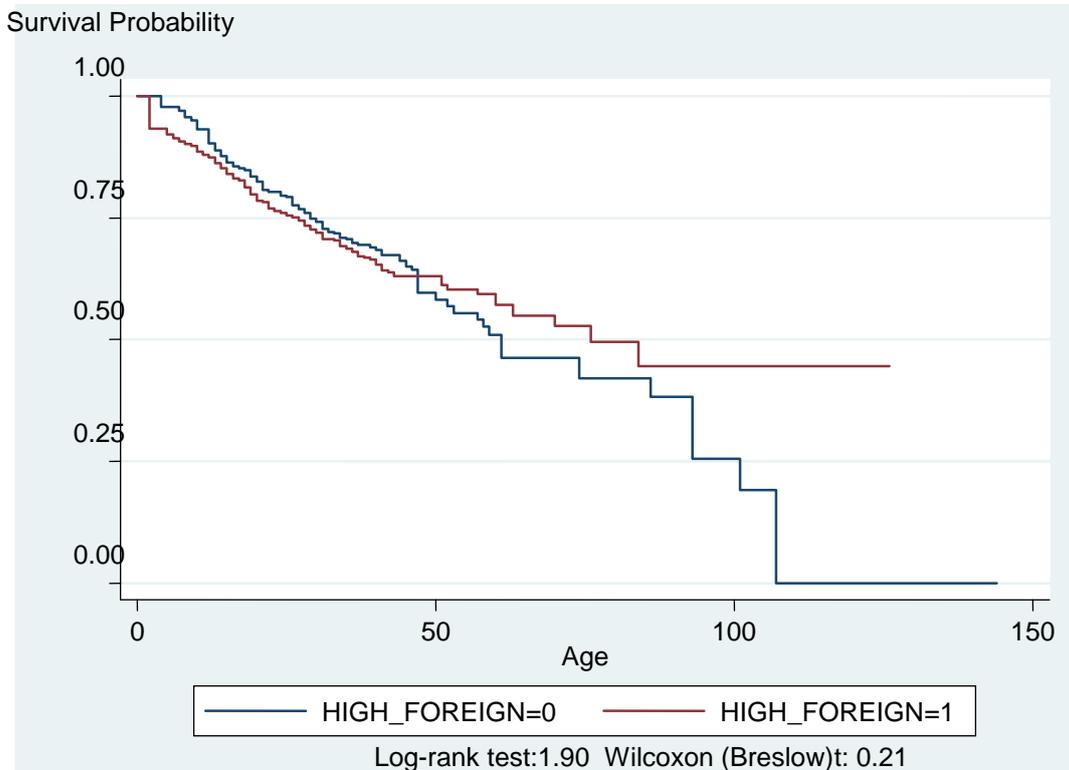


Fig. 3.2.6. Italian firms: Kaplan-Meier survival estimates by foreign investment (High and Medium-High Tech)

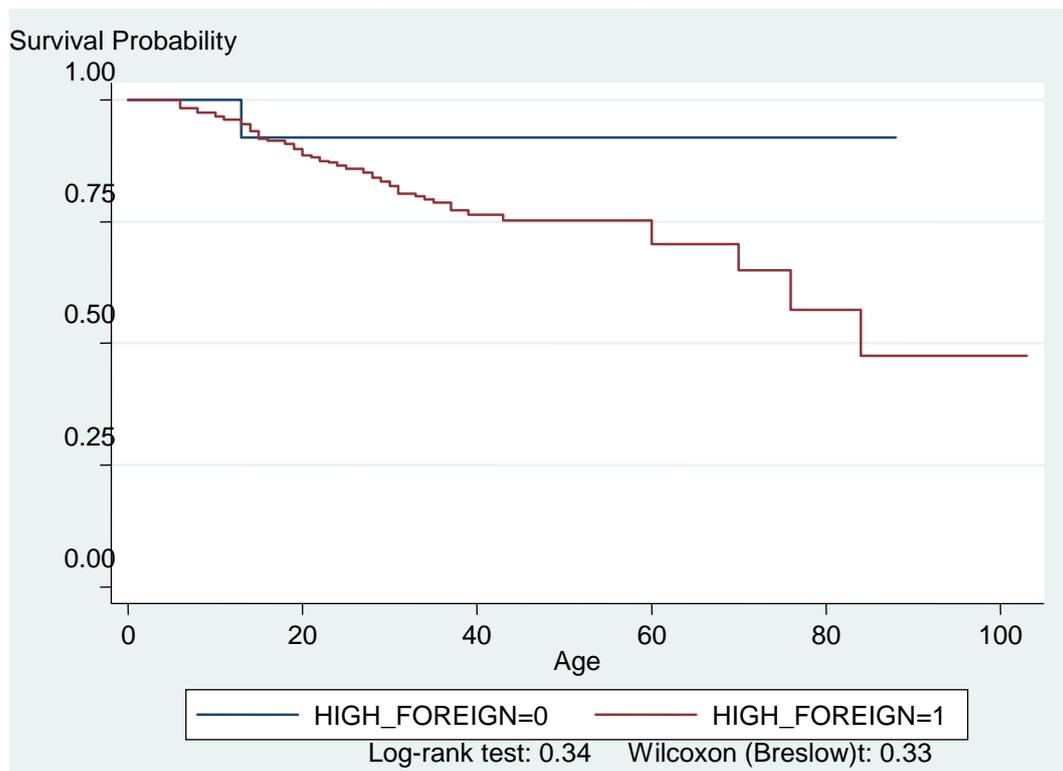


Fig. 3.2.7. Italian firms: Kaplan-Meier survival estimates by foreign investment (Low and Medium-Low Tech)

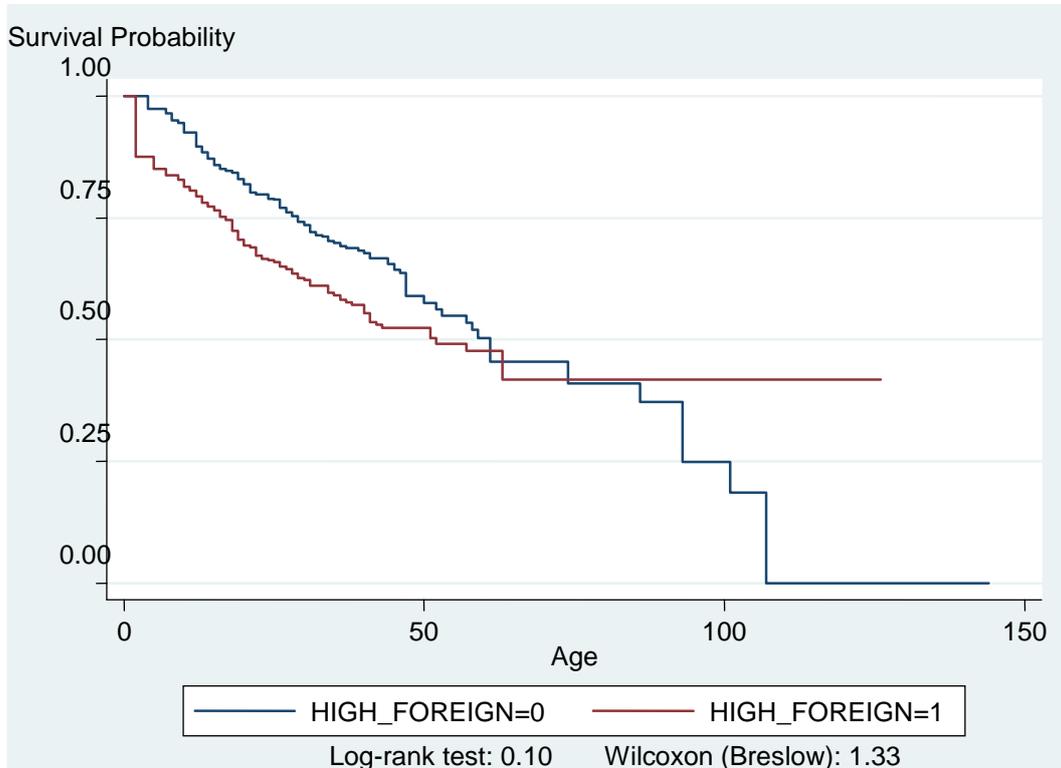
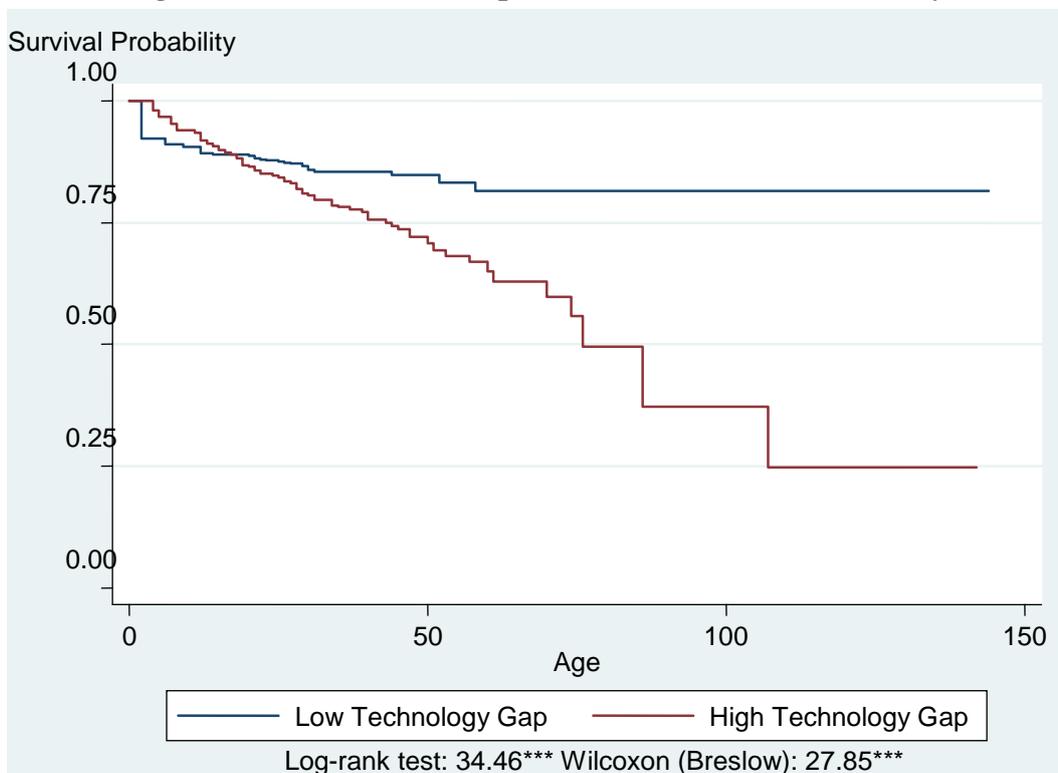


Fig. 3.2.8. Italian firms: Kaplan-Meier survival estimates by technology gap



Tab. 3.2.3. Regression estimates of firm exit: Cox Proportional Hazard Model (pooled sample and sub-samples, 2002-2010; Italian firms)

Variables firm-level	Pooled sample			Gap low			Gap high			Low-Medium Low Tech			High-Medium High Tech		
	HazardR atio		Robus t Std. err.	Hazard Ratio		Robust Std. err.	HazardR atio		Robust Std. err.	HazardR atio		Robust Std. err.	Hazard Ratio		Robust Std. err.
ldipendenti	1.055		0.140	0.681		0.209	1.477		0.247	1.293	*	0.197	0.508	**	0.189
lproductivity	0.498	***	0.105	1.221		1.362	0.423	*	0.093	0.415	***	0.090	1.342		0.313
l wage	6.110	*	6.282	8.841		17.320	12.065		25.785	1.477		1.315	719.080		3356.513
l wage*l age	0.935	**	0.030	0.851	*	0.073	0.952		0.057				0.749	**	0.109
capintensity	1.000		0.000	1.000		0.000	1.000		0.000	1.000		0.008	1.000		0.000
collateral	0.553		0.330	0.715		0.563	1.951		2.088	0.977		0.013	0.620		0.605
ptpm (profitability)	0.997		0.009	0.984		0.090	0.996		0.008	0.998		0.008	1.007		0.142
solvency_ratio	0.979	**	0.011	0.959		0.025	0.984		0.012	0.977	*	0.013	0.991		0.022
deb_bank/turno ver	0.992		0.007	0.974		0.019	0.995		0.009	0.988		0.008	1.012		0.016
domestic multinationals	0.373		0.321	0.623		0.637	0.403		0.496	0.224		0.280	1.832		1.798
impshare	1.056		0.094	1.022		0.149	0.966		0.121	1.024		0.096	0.018		0.056
expshare	0.939		0.046	0.860	**	0.062	0.993		0.064	0.927		0.050	4.626		6.473
FDI_own	0.000	**	0.002	0.000	***	0.000	0.316		1.758	0.000	**	0.000	0.000		0.000
FDIUP	0.841		0.122	0.294	***	0.106	0.907		0.175	0.714	*	0.137	0.467		0.712
FDIDOWN	0.927		0.108	1.213		0.229	0.952		0.131	0.947		0.141	4.881		13.393
FDI_share_re gion	1.633		3.139	0.000		0.003	82.552	**	191.77	1.948		3.812	1.155		6.807
esportatrici03	1.266		0.459	2.202		2.324	1.072		0.446	1.284		0.541	1.549		1.350
out_growthrate	0.948	*	0.030	0.959		0.035	0.950		0.038	0.898		0.034	0.926		0.066
entryrate	1.038		0.224	0.712	**	0.188	1.066		0.283	1.096		0.204	0.864		0.974
MES	1.010		0.011	1.130	***	0.038	0.988		0.013	1.010		0.011	0.917		0.068
HERF	0.931		0.043	0.486	***	0.138	1.012		0.060	1.041		0.084	1.298		0.303
gapclass2 (high gap)	0.688		0.362							0.594		0.307	0.928		0.701
techclass1 (low tech)	0.419		0.081	0.003	***	0.004	0.705		0.948						
Mezz	1.326		0.634	0.222		0.273	3.305	*	2.131	1.118		0.600	2.996		4.336
Number of obs	20335			10247			10177			14130			6209		
Wald chi2(25)	90.07			137.81			83.48			66.34			62.78		
Prob > chi2	0			0			0			0			0		
Log pseudolikeliho od	-168.305			-35.236			-88.967			-111.020			-25.626		

Coefficients are expressed as hazard ratios. *** = statistically significant at 0.01 per cent level. ** = statistically significant at 0.05 per cent level. * = statistically significant at 0.10 per cent level. All models includes time dummies. Random effects are included.

Tab. 3.3.1. Determinants of employment growth of Italian firms: GMM-system estimates

	GMM-system estimates, dependent variable: flab= employment at time t+1				
	Pooled sample	Gap low	Gap high	Low-Medium Low Tech	High-Medium High Tech
L.flab	0.905*** (0.0134)	0.907*** (0.0185)	0.902*** (0.0201)	0.887*** (0.0169)	0.898*** (0.0248)
lage	-0.0222** (0.0105)	-0,0206 (0.0143)	-0.0396*** (0.0136)	-0.0221* (0.0132)	-0,0262 (0.0160)
lproductivity	0.0939*** (0.0274)	0.0521* (0.0290)	0.141*** (0.0386)	0.0937*** (0.0306)	0.153*** (0.0501)
lwage	0.573*** (0.0745)	0.540*** (0.102)	0.622*** (0.0939)	0.625*** (0.0927)	0.336** (0.155)
capintensity	-0,000135 (0.000120)	0,0000864 (0.000222)	0,0000363 (0.0000896)	-0,000187 (0.000118)	0,000274 (0.000293)
collateral	-0,00136 (0.0465)	-0,0533 (0.0636)	-0,012 (0.0576)	0,0173 (0.0484)	-0,0986 (0.0754)
ptpm	-0,000133 (0.000712)	0,000877 (0.000835)	-0,000699 (0.000994)	-0,000583 (0.000809)	-0,00076 (0.00118)
solvency_ratio	0,00024 (0.000710)	0,00195* (0.00102)	0,00108 (0.00109)	-0,000198 (0.000874)	0,00219* (0.00128)
deb_banc_fatt	0.00133*** (0.000497)	0.00190** (0.000769)	-0,000021 (0.000586)	0,000932 (0.000585)	0.00191* (0.00107)
FDIIN	-0,00391 (0.0263)	0,0021 (0.0359)	-0,000761 (0.0364)	-0,0137 (0.0251)	-0,0362 (0.0646)
FDIOUT	0,00161 (0.0117)	-0,00358 (0.0145)	-0,00918 (0.0212)	-0,0227* (0.0133)	0,029 (0.0198)
imp	-0,000219 (0.00171)	0,000108 (0.00200)	-0,00234 (0.00222)	-0,0015 (0.00180)	0,00259 (0.00763)
exp	0.00248*** (0.000853)	0.00311*** (0.000871)	0.00374*** (0.00106)	0.00390*** (0.00101)	-0,00544 (0.00446)
FDI_OWN	-0,0741 (0.0698)	-0,149 (0.0987)	-0.214** (0.0831)	-0,0875 (0.136)	-0,249 (0.191)
FDIUP	0,000903 (0.00215)	-0,00105 (0.00292)	0,00284 (0.00253)	0,00313 (0.00221)	-0,00953 (0.0103)
FDIDOWN	-0,00225 (0.00285)	0,00177 (0.00362)	0,00106 (0.00347)	-0.00604** (0.00299)	0,0104 (0.0123)
FDI_SHARE_BYREGION	-0.156*** (0.0446)	-0.187*** (0.0527)	-0.222*** (0.0577)	-0.209*** (0.0568)	-0,0397 (0.0750)
out_growth	-0.00113** (0.000563)	-0,0011 (0.000781)	-0.00134** (0.000623)	-0,000377 (0.000647)	0,000914 (0.00107)
Entryrate	0,00574 (0.00494)	0,00468 (0.00644)	0,0048 (0.00586)	0,00678 (0.00498)	0,023 (0.0151)
Mes	-0.000575*** (0.000168)	-0.000434* (0.000238)	-0,000372 (0.000229)	-0.000575*** (0.000178)	-0,00054 (0.000563)
Herfhindal	0.00364***	0.00378***	0.00313**	0.00548**	0,0000239

	(0.00112)	(0.00135)	(0.00140)	(0.00254)	(0.00226)
gap1_2	0.0208***			0.0196***	0,00487
	(0.00685)			(0.00724)	(0.0156)
_cons	-6.198***	-5.597***	-7.249***	-6.659***	-4.266**
	(0.758)	(1.056)	(0.733)	(0.802)	(2.016)
<i>N</i>	15269	7811	7458	10552	4717

legend: * p<.1; ** p<.05; *** p<.01 Robust standard errors in brackets All models include time dummies.

**Table 4.1.1. Breakdown of Newly Established Companies with Foreign Capital
(Grouped According to Equity Capital, 1000 USD)**

	<\$50	\$50 - \$200	\$200 – \$500	> \$500	Total
All Sectors					
2004	1,468	462	102	97	2,129
2005	1,838	720	162	125	2,845
2006	1,976	863	241	208	3,288
2007	2,049	994	269	317	3,629
2008	1,704	953	349	331	3,337
2009	1,516	961	223	236	2,936
2010	1,506	1,164	289	350	3,309
2011	1,864	1,719	366	408	4,357
Manufacturing Industry					
2004	211	90	31	37	369
2005	258	132	37	29	456
2006	253	128	32	56	469
2007	265	155	40	32	492
2008	202	135	68	66	471
2009	171	135	39	43	388
2010	153	151	50	73	427
2011	155	173	54	80	462

Source: Undersecretariat of Treasury

Figure 4.1.1 Share of foreign firms in Turkish manufacturing (%)

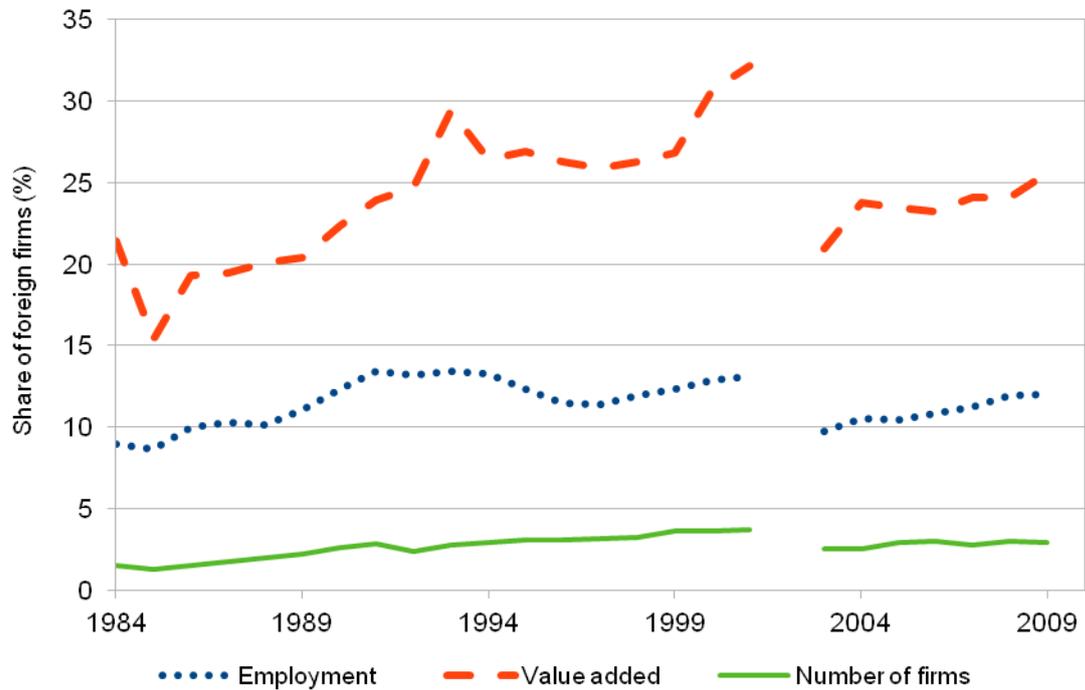


Figure 4.1.2. Inward FDI Regulatory Restrictiveness and Inward FDI Stock

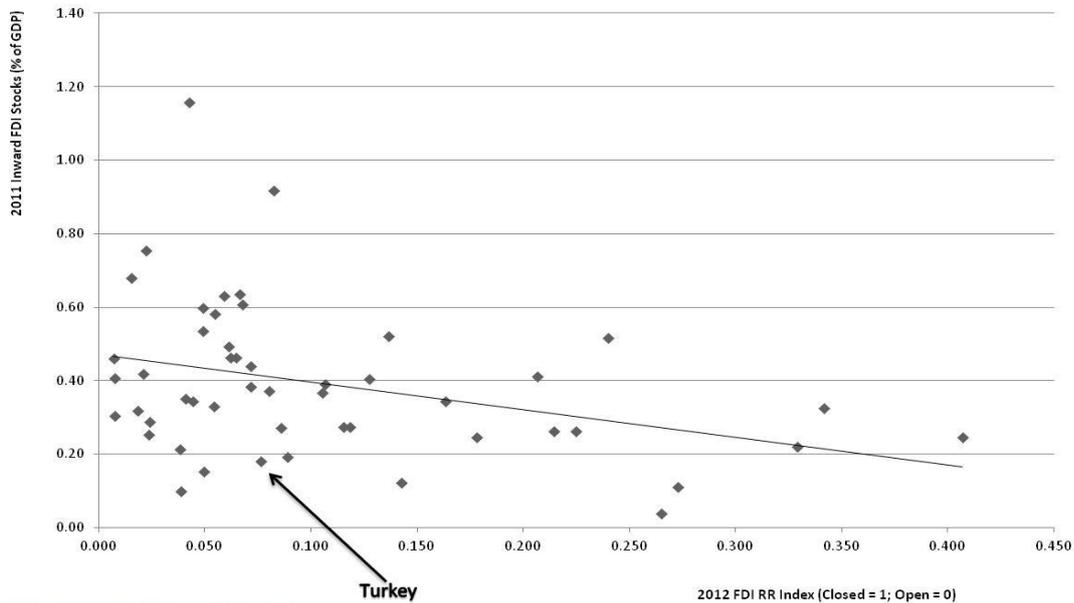


Table 4.3.1. Determinants of exit (1983-2001 dataset)

Variables	Models						
	1	2	3	4	5	6	7
fdi	-0.778*** [0.098]	-0.778*** [0.098]	-0.720*** [0.099]	0.241** [0.102]	0.241** [0.102]	0.285*** [0.102]	0.270** [0.118]
fdiqs	0.250** [0.112]	0.208* [0.115]	0,128 [0.119]	-0,107 [0.126]	-0,126 [0.128]	-0,112 [0.128]	0,001 [0.149]
fdiqr	0,119 [0.081]	0.153* [0.091]	0,110 [0.091]	0.302*** [0.084]	0.334*** [0.095]	0.282*** [0.096]	0,165 [0.110]
fdisupp_q	0,135 [0.473]	0,177 [0.474]	-0,107 [0.474]	0,146 [0.507]	0,161 [0.508]	0,108 [0.509]	0,373 [0.601]
fdibuy_q	-1.036*** [0.371]	-1.006*** [0.371]	0,030 [0.383]	0,311 [0.405]	0,321 [0.405]	0,273 [0.404]	-0,459 [0.478]
cfdiqs		0,371 [0.258]	0.430* [0.249]		0,192 [0.279]	0,154 [0.280]	0,272 [0.316]
cfdiqr		-0,189 [0.189]	-0,157 [0.189]		-0,144 [0.185]	-0,116 [0.187]	-0.461** [0.222]
lentrata			-0,033 [0.215]	0.808*** [0.215]	0.808*** [0.216]	0.709*** [0.220]	0.754*** [0.281]
sectgr			-0.208*** [0.074]	-0,100 [0.079]	-0,105 [0.079]	-0,101 [0.079]	-0.193* [0.099]
sectgrpr			-0.289** [0.118]	-0.276** [0.125]	-0.277** [0.125]	-0.283** [0.126]	-0,242 [0.158]
hhi			0.670*** [0.184]	0.514** [0.202]	0.520** [0.202]	0.497** [0.203]	0,149 [0.259]
mes			-0.307*** [0.035]	-0.516*** [0.039]	-0.517*** [0.039]	-0.467*** [0.039]	-0.386*** [0.052]
relsize				-0.678*** [0.019]	-0.678*** [0.019]	-0.657*** [0.019]	-0.661*** [0.023]
lw				-0.281*** [0.022]	-0.281*** [0.022]	-0.252*** [0.022]	-0.274*** [0.032]
pmargin				-0,041 [0.066]	-0,042 [0.066]	0,016 [0.066]	-0,050 [0.078]
subinput				0,095 [0.102]	0,094 [0.102]	0,096 [0.101]	0,036 [0.110]
suboutput				0.283*** [0.046]	0.283*** [0.046]	0.246*** [0.046]	0.236*** [0.049]
kl						-0.079*** [0.007]	-0.092*** [0.008]
ttrans							0.487*** [0.179]
rddum							-0.148*** [0.045]
N	87956	87956	87956	84014	84014	84012	56921
Log likelihood	-68859	-68857	-68801	-59084	-59084	-59029	-37086

Robust standard errors in brackets. All models include time dummies

*** p<0.01 ** p<0.05 * p<0.1

Table 4.3.2. Determinants of exit (2003-2009 dataset)

Variables	Models						
	1	2	3	4	5	6	7
fdi	-1.138*** [0.152]	-1.140*** [0.152]	1.108*** [0.152]	-0.460*** [0.148]	-0.462*** [0.148]	-0.395** [0.157]	-0.351** [0.155]
fdiqs	-0.056 [0.096]	-0.073 [0.100]	0.113 [0.107]	0.131 [0.125]	0.078 [0.130]	0.047 [0.180]	0.069 [0.182]
fdiqr	-0.365*** [0.094]	-0.070 [0.148]	0.032 [0.150]	0.042 [0.118]	0.013 [0.186]	-0.001 [0.229]	-0.046 [0.233]
fdisupp_q	21.059*** [6.991]	21.150*** [6.997]	15.090** [7.054]	25.283*** [9.040]	26.106*** [9.060]	42.750*** [13.199]	43.049*** [13.179]
fdibuy_q	-7.576** [3.536]	-7.697** [3.554]	-6.156* [3.591]	-5.674 [4.643]	-6.508 [4.687]	-7.849 [6.437]	-8.141 [6.471]
cfdiqs		0.029 [0.254]	0.223 [0.262]		0.546* [0.320]	0.731* [0.415]	0.773* [0.420]
cfdiqr		-0.514*** [0.182]	0.534*** [0.184]		0.052 [0.230]	0.236 [0.305]	0.173 [0.309]
lentrte			0.180 [0.241]	1.255*** [0.321]	1.229*** [0.321]	1.627*** [0.503]	1.597*** [0.501]
sectgr			0.045 [0.060]	-0.094 [0.068]	-0.090 [0.068]	-0.058 [0.100]	-0.047 [0.098]
sectgrpr			-0.134 [0.138]	-0.364** [0.155]	-0.378** [0.155]	-0.446** [0.213]	-0.489** [0.211]
hhi			0.457*** [0.153]	-0.862*** [0.195]	-0.874*** [0.195]	-0.875*** [0.270]	-0.863*** [0.270]
mes			0.182*** [0.015]	-0.323*** [0.022]	-0.327*** [0.022]	-0.374*** [0.033]	-0.363*** [0.033]
relsize				-0.511*** [0.013]	-0.512*** [0.013]	-0.575*** [0.018]	-0.566*** [0.018]
lw				0.012 [0.027]	0.012 [0.027]	0.066* [0.037]	0.015 [0.038]
pmargin				-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]
subinput				0.100 [0.138]	0.101 [0.138]	0.270 [0.177]	0.135 [0.187]
suboutput				0.392*** [0.037]	0.391*** [0.037]	0.192*** [0.053]	0.238*** [0.054]
kl						-0.045*** [0.011]	-0.059*** [0.011]
ttrans							0.345*** [0.048]
rddum							-0.241 [0.263]
N	18230	18223	18223	16305	16305	12829	12829
Log likelihood	-31656	-31640	-31590	-22654	-22653	-12796	-12777

Robust standard errors in brackets
**
*** p<0.01 p<0.05 * p<0.1
All models include time dummies

Table 4.3.3. Determinants of survival and growth (Heckman model)

	1983-2001 dataset		2003-2009 dataset	
	Growth	Survival	Growth	Survival
llab	0.962*** [0.002]		0.904*** [0.008]	
relsize		0.389*** [0.008]		0.710*** [0.018]
lage	-0.025*** [0.001]	-0.005 [0.007]	-0.227*** [0.012]	0.130*** [0.024]
fdi	0.014* [0.007]	-0.077** [0.036]	0.111*** [0.023]	0.320*** [0.101]
fdiqs	0.001 [0.012]	-0.197*** [0.059]	0.083* [0.043]	-0.055 [0.131]
fdiqr	-0.030*** [0.010]	-0.625*** [0.049]	-0.041 [0.056]	-0.117 [0.150]
fdisupp_q	-0.097** [0.045]	-2.185*** [0.227]	0.939 [2.878]	-12.806* [7.095]
fdibuy_q	0.078** [0.037]	1.158*** [0.180]	-1.170 [1.455]	0.802 [3.567]
cfdiqs	-0.008 [0.024]	-0.238* [0.125]	0.048 [0.089]	-0.390 [0.268]
cfdiqr	0.048** [0.023]	1.411*** [0.103]	-0.098 [0.090]	0.299 [0.198]
lentrte	0.069*** [0.024]	0.081 [0.123]	-0.349 [0.225]	-0.002 [0.481]
sectgr	0.049*** [0.007]	0.171*** [0.035]	0.062 [0.042]	0.042 [0.081]
sectgrpr	0.028** [0.012]	-0.825*** [0.059]	0.127** [0.063]	0.017 [0.133]
hhi	-0.032 [0.021]	-0.075 [0.102]	0.032 [0.064]	0.883*** [0.203]
mes	0.008** [0.004]	0.214*** [0.016]	0.040*** [0.013]	0.519*** [0.029]
lw	0.027*** [0.002]	-0.054*** [0.010]	0.029** [0.015]	-0.062** [0.027]
pmargin	0.033*** [0.007]	-0.073** [0.031]	-0.013 [0.020]	0.035 [0.028]
subinput	0.056*** [0.013]	0.102** [0.050]	-0.067 [0.059]	-0.145 [0.129]
suboutput	-0.016*** [0.006]	-0.208*** [0.023]	-0.038** [0.017]	-0.030 [0.037]
kl	0.027*** [0.001]	0.018*** [0.004]	0.053*** [0.004]	0.017** [0.007]
N	106776		20261	
Log likelihood	-56958		-16206	

Robust standard errors in brackets

*** p<0.01

All models include time dummies

Table 4.3.4. Determinants of growth (1983-2001 dataset)(GMM-system estimates)

Variables	Models				
	1	2	3	4	5
llab	0.471*** [0.009]	0.694*** [0.006]	0.694*** [0.007]	0.667*** [0.006]	0.630*** [0.007]
fdi		0.316*** [0.032]	0.276*** [0.034]	0.229*** [0.034]	0.131*** [0.041]
fdiqs	-0.105** [0.053]	-0.055 [0.035]	-0.074** [0.038]	-0.071* [0.037]	-0.055 [0.038]
fdiqr	0.057 [0.043]	0.035 [0.030]	0.043 [0.032]	0.093*** [0.032]	0.146*** [0.034]
fdisupp_q	-0.269** [0.127]	-0.384*** [0.094]	-0.393*** [0.095]	-0.552*** [0.091]	-0.642*** [0.095]
fdibuy_q	0.141 [0.158]	0.151 [0.111]	0.186* [0.113]	0.201* [0.111]	0.137 [0.113]
cfdiqs	0.025 [0.033]		0.058** [0.029]	0.048* [0.029]	0.062* [0.032]
cfdiqr	-0.007 [0.042]		-0.099*** [0.035]	0.013 [0.036]	-0.101** [0.045]
lentrte	0.194*** [0.039]	0.092*** [0.027]	0.124*** [0.031]	0.194*** [0.031]	0.194*** [0.042]
sectgr	0.054*** [0.009]	0.071*** [0.008]	0.071*** [0.008]	0.046*** [0.008]	0.047*** [0.009]
sectgrpr	0.043*** [0.014]	0.151*** [0.012]	0.155*** [0.013]	0.060*** [0.013]	0.108*** [0.015]
hhi	-0.295*** [0.090]	-0.335*** [0.063]	-0.318*** [0.064]	-0.317*** [0.062]	-0.480*** [0.071]
mes	0.378*** [0.014]	0.192*** [0.010]	0.197*** [0.010]	0.181*** [0.011]	0.194*** [0.012]
lage		-0.070*** [0.004]	-0.070*** [0.004]	-0.051*** [0.004]	0.030*** [0.005]
lw		0.086*** [0.006]	0.086*** [0.006]	0.023*** [0.006]	0.125*** [0.008]
pmargin		0.046*** [0.011]	0.049*** [0.011]	0.013 [0.011]	0.026* [0.014]
subinput		0.132*** [0.020]	0.106*** [0.022]	0.078*** [0.022]	0.040 [0.027]
suboutput		-0.128*** [0.019]	-0.131*** [0.020]	-0.141*** [0.019]	-0.121*** [0.023]
kl				0.089*** [0.003]	0.089*** [0.004]
ttrans					0.056* [0.033]
rddum					0.034*** [0.006]
N	70425	68350	68350	68348	47856

Standard errors in brackets

*** p<0.01 * p<0.1

All models include time dummies

flab: Employment growth rate at time t+1, flab=ln(Lt+1/Lt)

Table 4.3.5. Determinants of growth (2003-2009 dataset)(GMM-system estimates)

Variables	Models				
	1	2	3	4	5
llab	0.741*** [0.035]	0.791*** [0.028]	0.795*** [0.028]	0.835*** [0.028]	0.831*** [0.027]
fdi		0.804*** [0.219]	0.806*** [0.221]	0.385** [0.182]	0.201 [0.152]
fdiqs	0.267*** [0.067]	-0.055 [0.072]	-0.067 [0.077]	-0.018 [0.071]	-0.009 [0.065]
fdiqr	0.024 [0.070]	-0.195*** [0.071]	-0.170** [0.072]	-0.176** [0.072]	-0.148** [0.069]
fdisupp_q	-0.014 [0.307]	-0.387 [0.350]	-0.384 [0.351]	-0.924*** [0.332]	-0.866*** [0.304]
fdibuy_q	-0.224 [0.168]	-0.282 [0.175]	-0.270 [0.175]	-0.041 [0.161]	-0.050 [0.150]
cfdiqs	-0.038 [0.080]		0.058 [0.079]	0.079 [0.077]	0.064 [0.074]
cfdiqr	0.049 [0.175]		-0.356** [0.168]	-0.351** [0.173]	-0.387** [0.169]
lentrata	0.072 [0.159]	-1.487*** [0.219]	-1.477*** [0.219]	-1.313*** [0.213]	-1.251*** [0.209]
sectgr	0.065** [0.033]	-0.036 [0.034]	-0.038 [0.034]	0.046 [0.034]	0.056* [0.033]
sectgrpr	0.176*** [0.062]	0.203*** [0.072]	0.205*** [0.072]	0.172** [0.072]	0.187*** [0.070]
hhi	-0.265*** [0.097]	-0.077 [0.082]	-0.070 [0.082]	-0.112 [0.076]	-0.123* [0.074]
mes	0.089*** [0.023]	0.018 [0.017]	0.016 [0.017]	0.001 [0.017]	0.006 [0.016]
lage		-0.457*** [0.026]	-0.466*** [0.026]	-0.465*** [0.027]	-0.454*** [0.026]
lw		0.277*** [0.052]	0.274*** [0.053]	0.210*** [0.051]	0.218*** [0.049]
pmargin		0.510*** [0.052]	0.505*** [0.052]	0.405*** [0.057]	0.401*** [0.056]
subinput		0.113 [0.092]	0.117 [0.092]	0.116 [0.100]	0.125 [0.096]
suboutput		0.047 [0.033]	0.045 [0.033]	0.081** [0.034]	0.080** [0.034]
kl				0.050*** [0.009]	0.052*** [0.009]
ttrans					0.038 [0.023]
rddum					0.015 [0.060]
N	8617	8437	8437	7450	7450

Standard errors in brackets

*** p<0.01 * p<0.1

All models include time dummies

flab: Employment growth rate at time t+1, flab=ln(Lt+1/Lt)