MNEs and Start-up Growth

- *do good firms breed good startups?*

ABSTRACT

The role of incumbent firms as 'parents' of employee spinoffs is established, but less is known about the characteristics of incumbent firms that provide employees with better opportunities to acquire and develop knowledge, skills, and experiences of relevance for founding new successful business ventures. Building on a conceptual framework that links work-experience to initial startup quality and post-entry performance through a selection and treatment effect, we posit that having individuals with work-experience in Multinational Enterprises (MNEs) as a part of the initial startup team, either as founders and/or early joiners, is a specific asset that has positive influence on the quality and post-entry performance of new firms. We use detailed Swedish data on over 13,000 new firms over the period 2000-2014, and show that the presence of individuals with MNE work-experience in the initial startup team has a positive effect on start-up size, as well as employment growth in the short (3 years), medium (5 years) and long run (10 years). Instead we do not find any effect on the rate of survival of startups. The effect of MNE experience on post-entry growth yet depends on the position the individuals had in the MNE. It is primarily experiences from having a high-level position in the MNE that matters for the post-entry employment growth, particularly a position as manager. Our results highlight that MNEs are a specific type of firm that serve as breeding grounds and play a role as 'anchor' firms that can support the development of start-ups by indirectly 'feeding' the economy with relevant experiences and skills.

JEL-codes:
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1. INTRODUCTION

A key idea in the literature on industry evolution and the origins of start-ups is that incumbent firms are breeding grounds for new entrepreneurs (Klepper 2011, Gompers 2005, Agarwal et al 2004, Feldman et al 2019).[1] Employees develop experiences, knowledge, and skills and learn about organizational routines and practices at their employers that bode for ideas for business ventures as well as capabilities to successfully realize such ideas, by developing new firms that survive and grow. There is indeed significant evidence that employee spinoffs, i.e. new firms started by employees of incumbent firms, perform better than *de novo* entrants (Erikson and Kuhn 2006, Andersson and Klepper 2013). A main explanation for this empirical regularity is that founders of employee spinoffs inherit knowledge of technology, business practices, markets, organizational routines as well as networks to customers, suppliers, and potential colleagues from their prior employers (Agarwal 2016, Feldman et al 2019, Klepper 2009, Furlan and Grandinetti 2020, Criaci et al 2021, Basu et al 2015).

While the role of incumbent firms as 'parents' of employee spinoffs is established, less is known about the characteristics of incumbent firms that provide employees with better opportunities to acquire and develop knowledge, skills, and experiences of relevance for founding new successful business ventures. Firms are heterogenous among several dimensions, such as size, competitive position, R&D investments, innovativeness and business strategy, and available conceptual frameworks ,as well as empirical studies, point in different directions regarding how different traits of parent firms influence the performance of new firms.

One example concerns the influence that the size of the parent firm has on the survival and growth of employee spinoffs. Some scholars argue that the quality of the parent firm conditions the quality of the new firms that employees will form, i.e. 'good firms spawn good spinoffs' (Gompers et al 2005, Klepper 2009). Spinoffs with founders who have work-experience in large and resourceful firms should from this perspective perform better. Hvide (2009), Andersson and Klepper (2013) as well as Andersson et al (2012) find evidence in this direction. On the other hand, other scholars suggest the contrary, based on the argument that employees in small firms are more likely to develop entrepreneurial human capital,[2] and find evidence that spinoffs from large parents perform worse in terms of longevity of the firm and income of their founders (Sørensen 2007, Elfenbein et al. 2010, Sørenson and Phillips 2011).

The literature also shows that there are several aspects that moderate the influence that parent characteristics have on the performance of new firms, including industry and market overlap between the parent firm and the employee spinoff (Bahoo-Torodi and Torrisi 2022, Chatterji 2009), the occupation and position in the parent

[1]Klepper (2011, p.145) conceptualizes incumbent firms as "natural training grounds for the next generation of entrepreneurs".

[2]For example, large firms often have a finer division of labor than small firms, and employees in smaller firms are more likely to be exposed to the whole business operations and thus be in a better position to develop balanced skills ('jack-of-all-trades') that bode for successful entrepreneurship (Lazear 2004).

firm (Lazear 2004, Unger et al 2011, Andersson and Koster 2018), technology overlap (Bae and Lae 2021) as well as disagreements and conflicts between the parent and the spinoff (Klepper and Sleeper 2005, Klepper and Thompson 2010, Walter et al 2014). In addition, recent studies have questioned the typical singular focus on founders and their backgrounds and have broadened the focus to consider the role of the whole initial team in startups (Rocha et al 2016, Nyström 2019, Choi et al 2023, Koch et al 2013).[3] Choi et al (2023) analyze the impact on startups of a sudden loss of early joiners, defined as "non-founder employees" in the first year of a startup, and find that this has large negative effects on startups, which persist over time. They conclude that a key part of the organizational capital of start-ups is embodied in early joiners. These results suggest that it is not only important to assess the labor market background of founders; initial employees (or early joiners) also bring knowledge, skills and experiences from their prior employers that can be key resources for the post-entry performance of new firms.

In this paper, we contribute with an analysis of characteristics of incumbent firms that provide employees with better opportunities to acquire and develop knowledge, skills, and experiences of relevance for the post-entry performance of startups. We combine perspectives from the international business literature (Dunning 1977, Narula et al 2019, Rugman and Verbeke 2003, Pitelis and Teece 2018), the literature on spinoffs and resource inheritance (Agarwal 2016, Feldman et al 2019, Klepper 2009, Furlan and Grandinetti 2020) as well as the broad literature on the role of human capital in startups (Colombo and Grilli 2005, Lazear 2004), and posit that having individuals with work-experience from Multinational Enterprises (MNEs) in the initial startup team, as founders and/or early joiners, is a specific asset that has positive influence on the quality and post-entry performance of new firms.

A common argument in international business is that MNEs have firm-specific advantages (FSA) which comprise both resources in the form of proprietary technology and knowledge as well as organizational capabilities in the form of 'management practices' and ways to efficiently coordinate global production (Rugman and Verbeke 2001).[4] Empirical analyses that compare MNEs to non-MNEs also confirm that MNEs do have a set of defining characteristics, such as high intensity of R&D as well as scientific and technical workforce, large intangible assets and significant innovation and product differentiation efforts (Markusen 2002). Using a global survey of more than 10,000 firms across 20 countries, Bloom et al (2012) show that MNEs, relative to other firms, tend to be well-managed and use advanced management practices. Employees in MNEs are from this perspective likely to develop knowledge, experiences and skills that are difficult to

[3]The focus on founders has a long tradition in the literature on startups. In a classic study from the 1970s, Cooper and Bruno (1977, p. 21) state: "for a new, high-technology firm, the primary assets are the knowledge and skills of the founders. Any competitive advantage the new firm achieves is likely to be based upon what the founders can do better than others."

[4]A typical argument in the international business literature is that MNEs have overcome the 'liability of foreignness' (Hymer 1976, Dunning 1977, Zaheer 1995). This implies that MNEs have some kind of firm-specific advantages that are transferable between parent and subsidiaries and allow MNEs to do business globally and compete with local firms, while dealing with obstacles of multinational activity (Buckley and Casson 1985, Caves 1996).

develop elsewhere, such as specific management practices, knowledge of technology, international sales, or business networks, but are valuable for startups and transferable through labor mobility (Andersson et al 2022, Faria et al 2021). By founding a startup or joining the initial startup team as an employee, such knowledge, experiences, and skills become available to startups (cf. Holm et al 2020, Balsvik 2011, Girma et al 2015).

We argue that MNE-experience has a positive effect on startup quality, as evidenced by startup size, and post-entry performance, as evidenced by survival and employment growth. We develop a conceptual framework that links MNE-experience to a selection and a treatment mechanism, respectively.[5] The *selection mechanism* maintains that startups whose founders and/or early joiners are individuals who previously worked at MNEs are larger at the foundation stage, because they have stronger entrepreneurial ideas and have higher market potential or value creation prospects. Our framework identifies two sub-mechanisms behind the selection effect: (i) opportunity costs (MNEs pay high wages and offer good internal career prospects, which suggest that employees are reluctant to leave unless a startup has good prospects), and (ii) idea generation and validation (MNEs constitute environments in which employees are in a better position to come up with high quality ideas for new business ventures and also have better opportunities to validate their ideas). The *treatment mechanism* contends that individuals who left an MNE found or join the initial team of startup that have better chances of survival and growth, because former MNE employees bring skills, mindset, resources and capabilities that impact the early organizational structure of the startup and its market potential and value creation prospects. Three main reasons for this mechanism are put forth: (i) better financial resources from larger personal wealth and networks to potential funders, (ii) experience and capabilities of different types of business practices and technologies, and (iii) professional networks.

We test the empirical relevance of our arguments using detailed Swedish data on over 13,000 new firms that started as incorporated new firms over the period 2000-2014. Matched employer-employee data are used to identify the work history of the individuals employed in each firm in its founding year, and we employ variables reflecting whether the start-up team includes individuals that previously worked at an MNE. The richness of the data allows us to control for several confounding factors that may explain startup size as well as survival and growth. We introduce a new way to empirically assess the influence of the combined labor market background of the whole initial team and develop indicators that capture the average size and average productivity and wages of the prior employers of individuals in the initial start-up team. This allows to single out the specific MNE-parent effect, from a generic effect from a 'better' (larger, more productive, paying higher wages) parent. We also control for the overlap between the industry of the new firm and the industry of the prior employer of the members of the initial start-up team, as well as the prior occupation, wage, gender and age composition of the initial startup team.

[5] The terms "selection" and "treatment" in this context refers to the ways in which the labor market background of founders and employees with an MNE background influences their decision to join a startup and their actual contribution to its growth. This is not to be confused with "selection" and "treatment" effects in expermental econometric study designs.

Furthermore, the data allow us to address a specific empirical challenge that has to do with selection on individual characteristics on the labor market, i.e. labor market sorting on ability and ambition. One reason why having individuals with MNE work experience matter for the performance of startups is that MNEs attract good workers. Chatterji (2009) refers to this as the "good people work for good firms" effect. In our empirical context it means that, unless controlled for, our indicators of MNE experience may reflect that good people with specific abilities and ambition sort to MNEs, rather than an effect arising from the accumulation of knowledge, experiences and skills in MNEs. Our data allow us to identify the high school Grade Point Average (GPA) of every individual in the startup team and include it as a control in our regression analyses. Highschool GPA is a recognized proxy for an individual's ability or ambition (Geiser and Santelices 2007, Grogger and Eide 1995, Miller 1998) and alleviates potential issues with labor market sorting counfounding the MNE-experience effect.

The results show that having individuals with MNE work-experience in the initial startup team (founders or early joiners) has a positive effect on start-up size as well as employment growth in the short (3 years subsequent entry), medium (5 years subsequent entry) as well as long run (10 years subsequent entry). These results are robust to the inclusion of several pertinent control variables that are motivated by prior theoretical as well as empirical contributions and hold up to various robustness checks. The empirical results are thus consistent with our conceptual framework that links MNE-experience to startup-quality and post-entry performance through a selection and treatment effect. However, our analyses also show that the effect of having individuals in the initial startup team (founders or early joiners) with MNE experience on post-entry employment growth depends on the position they had in the MNE. We find that it is primarily experiences from having a high-level position in the MNE that matters for post-entry employment growth, particularly a position as manager. That is, the *treatment effect* on post-entry employment growth is conditional on individuals having experience from a high-level position in the MNE. We interpret this as that high-level workers in management positions in MNEs are in a better position to learn about management practices and develop skills of relevance to scale up new businesses (cf. Andersson et al 2022, Faria et al 2021). Managers are for instance often involved in a broad set of decision-making tasks and develop an understanding of broader spectrum of the business operations than employees in more specialized work, and such capabilities are of relevance to scale up a business. Recent empirical evidence also suggests that managerial human capital is transferable between organizations (Sofka et al. 2014). A surprising result is that we find no robust statistically significant effect of MNE-experience on the survival rate of new firms. However, a main determinant in our analyses of survival is initial startup size and, given the strong association between startup size and MNE-experience, we interpret this result as that the effect of MNE-experience on survival goes through start-ups size. Still, having workers from MNEs in the initial startup team has no independent effect on survival beyond its relation to start-up size.

In addition to establish the effect of MNE-experience, our analyses provide additional evidence of how characteristics of prior employers of the members of the startup team influence startup size, survival, and employment growth subsequent entry. First, we find that the average size of the prior employers of the individuals in the initial startup team has a positive influence on startup size, survival as well as employment growth. This lends support to the argument of the importance of large and resourceful firms as breeding grounds for entrepreneurs (Klepper 2009, Maliranta and Nurmi 2018) as well as employees with relevant skills, knowledge, and experience (Agarwal and Cockburn 2003). Second, we find that the average wage of members of the initial team at their prior employer have a robust positive influence on both startup quality, survival, and employment growth, indicating the role of having had a high-level position at the previous employer. Third, we find that the fraction of individuals in the startup team with experience from the same industry as the startup has a positive influence on startup size, survival as well as employment growth. This reinforces previous findings in the literature on the role of industry experience (Delmar and Shane 2006).

Our paper makes at least four distinct contributions. First, we contribute to the literature on entrepreneurial spawning (Klepper 2009, Feldman et al 2019, Agarwal et al 2016), by pointing to MNEs as a specific type of firm that serve as breeding grounds for both founders as well as employees with knowledge, skills and experiences that can support the post-entry performance of startups. Second, our findings add additional perspectives to the literature on entrepreneurial spawning by pointing to that the effect of the 'parent firms' appear to be contingent on which positions individuals held at their parents (cf. Sofka et al 2014, Faria at al 2021). Third, by considering the whole initial startup team, i.e. that include founders as well as early joiners, and showing that their combined background influence startup performance provide additional arguments to the recent literature that emphasize that the experiences and characteristics of initial employees (or early joiners), not only founders, play a key role in explaining startup performance (Choi et al 2023, Rocha et al 2016). Fourth, our results on the role of prior work experiences in MNEs adds to the literature on the indirect effects of the local of presence of MNEs in an economy (Castellani and Zanfei 2006, Girma et al 2019, Rojec and Knell 2018), by providing evidence on a previously neglected mechanism in this literature. The results of our analyses suggest that MNEs can play a role as 'anchor' firms (Agarwal and Cockburn 2003) that can support the development of start-ups (tenants) by indirectly 'feeding' the economy with relevant experiences and skills. While the role of large established firm is recognized in the literature on entrepreneurial ecosystem (Mason and Brown 2014), our results provide new evidence on the specific role of MNEs as drivers of local entrepreneurship.

The remainder of the paper is organized as follow. Section 2 presents our conceptual framework that links MNE experience to initial start-up quality and post-entry performance. We first introduce the idea of a selection mechanism that links MNE-experience to initial startup quality and then discuss the treatment mechanism that outlines how MNE-experience influence survival and growth of new firms. Section 3 presents the data,

definition of variables as well as our empirical strategy. Section 4 presents our results, including several robustness tests. In the last section, Section 5, we discuss our results and presents conclusions.

2. WORK-EXPERIENCE IN MNEs, THE INITIAL QUALITY AND POST-ENTRY PERFORMANCE OF NEW FIRMS

The competence-based view of new firms (Colombo and Grilli, 2005) holds that new firms' capabilities that influence their performance ultimately reside in the knowledge, experiences, and skills of the people in the firm. Many experiences, skills and types of knowledge of relevance for startups are formed by individuals' work experience (Lazear 2004, Unger et al 2011). In this vein, Klepper (2011, p.145) conceptualizes incumbent firms as "natural training grounds for the next generation of entrepreneurs", and there is plenty of evidence that new firms started by people with business and industry experience outperform other types of ventures (Wennberg et al 2011, Erikson and Kuhn 2006, Andersson and Klepper 2013).

MNEs are especially well positioned to serve as training grounds for individuals to develop relevant experiences, skills and knowledge that can benefit new firms (Andersson et al., 2022, Faria et al 2021). This is due to the experience and capabilities gained by MNE workers in production technologies, marketing, management processes, and many other business functions, (Balsvik 2011, Fosfuri et al. 2001, Girma et al. 2015, Holm et al. 2020, Faria et al 2021). By leaving MNEs to found, or join, a new firm, the knowledge, skills, and capabilities of the individuals is transferred to the new firm, which is expected to leave footprints on its overall performance.

MNEs can thus be important breeding grounds for high-level employees who can feed startups with the human capital they require for scaling-up and growth (Andersson et al. 2022). Employee mobility from MNEs to entrepreneurship may contribute to industrial dynamics through resource reallocation resulting in aggregate productivity growth (Aghion et al. 2015, Audretsch 1995, Altomonte and Colantone, 2008). The relevance of these types of arguments rests on the quality and performance of ventures started by former employees of incumbent MNEs. We posit here that there are two main mechanisms that link MNE-experience to startup quality and post-entry performance: a selection and treatment effect.

2.1 MNE-experience and start-up quality: a selection effect

A large literature shows that initial startup quality is an important factor that influence the subsequent performance of new ventures. Initial size has been widely considered as a proxy of the startup quality and prospects. Startups that are larger at foundation differ from smaller ones in their process of formation and the subsequent internal organization (Cooper et al. 1989).

Startups that begin with a larger foundation mobilize more capital, allowing them to pursue more ambitious goals and initiatives. Consequently, entrepreneurs would need to seek funding from sources beyond personal savings. This necessitates the involvement of external funding parties who must be convinced of the commercial viability and prospects of the idea underlying the new venture.

These startups also have a solid and well-thought-out structure from the beginning, which can be an enabling factor in a wide range of startup processes such as strategic planning, operations, research and development, talent acquisition, and so forth (Cooper et al. 1994). Startup initial size may be also associated with characteristics of the founding team, composed by the founder(s) along with individuals who join the founder(s) in the early stages to help shape the business (Choi et al. 2023, Roach and Sauermann 2015). These individuals often bring specific skills, industry knowledge, or additional perspectives critical to the startup's success (Kim 2018).

We posit that the link between the presence of a former MNE employee in the founding team of a startup and the startup initial size rests on a *selection mechanism* (Bennett and Chatterji 2023). According to this mechanism, startups whose founders and early joiners include individuals who left an MNE, are larger at the foundation stage because they entail better entrepreneurial ideas that have higher market potential or value creation prospects.

The selection mechanism, in turn, consists of two distinct sub-mechanisms: the first one is related to the *opportunity costs* faced by the entrepreneur as well as other early members of the founding team (Amit et al. 1995, Leibenstein 1968); the second one is related to the *idea generation and validation* processes (Berg 2016).

Opportunity costs

Opportunity costs have different sources (Bates 2005, Cassar 2006, Shane and Venkataraman 2000, Stenard and Sauermann 2016). First, starting a new venture or be part of it may involve financial stress, and many startups take time to generate profits. As an employee in an MNE, one likely enjoys higher-than-average income and benefits. Quitting a position in an MNE to found or join a startup can lead to a significant reduction in income, especially in the early stages of the venture (Conti and Roche 2021, Koellinger and Thurik 2012). These short-run losses should be offset by business ideas with higher market potential or value creation prospects, in turn leading to higher initial startup size (Cassar 2006). Second, MNEs may offer better career potential both nationally and internationally through foreign affiliates that startups cannot offer, at least in their early stages of development (see Agarwal et al. 2022 on the relevance of career prospects on new venture formation). In addition, founding or join a startup involves a considerable amount of risk, including market uncertainties, competition, financial challenges, and operational complexities (Janney and Dess 2006). Employees in MNEs have the advantage of operating within an established organization, whose chances of financial distress are less likely than average, with reduced personal risk. This higher risk should be

compensated by higher market potential or value creation prospects. Startups that have a larger than the average initial size are usually those that are also more likely to have higher market potential and value creation prospects, therefore we can expect MNE employees to be more likely to found or join startup with larger initial size.

Idea generation and validation

The second sub-mechanism leading to the self-selection of founding teams willing to establish startups that are larger at foundation relates to the idea generation and validation processes (Berg 2016). Having a stronger idea can make the difference between value creation and destruction for any company, but this is especially true for startups, whose very existence depends on introducing innovative products to the market.

Being part of an MNE can potentially facilitate successful idea generation (Mannucci ad Perry-Smith 2022). This is because such a setting provides access to new and diverse information, along with an effective idea generation process that relies on an environment fostering learning, discussion, and creativity (Hasan and Koning 2019, Perry-Smith and Mannucci 2017). MNEs are in general much more R&D-intensive and engage in innovation-related work. Consequently, both the likelihood of coming up with an idea as well as the "quality" of ideas is likely to be better in MNEs (Gruber et al. 2013). Moreover, while an idea for a startup may be compelling, it is crucial to validate and test the concept before committing full-time (Berg 2016). By leveraging MNEs' resources and networks, employees in MNEs can explore opportunities to validate their business idea while maintaining their current employment (Soda et al. 2021). This can help mitigate the risk of launching a startup that may not have sufficient market demand or a viable business model. Upon validation and testing, potential founders may be more confident on the value creation prospects of the business idea. This implies that they will be willing to invest a larger amount of resources in it and hence leading to the founding of a larger startup.

It is noteworthy that the relevance of the selection mechanism is limited in both time and scope. Firstly, it holds significance in the pre-founding stage of a startup. During this phase, potential entrepreneurs must carefully consider the costs and benefits of their professional choices. The primary components of these choices encompass the opportunity costs associated with initiating a new venture and the anticipated benefits tied to the quality of the idea underlying the new venture. Secondly, the selection mechanism carries greater significance in explaining the initial size of a startup when the founder has departed from an MNE. Despite both founders and individuals joining a startup from an MNE facing substantial opportunity costs, the process of idea generation and validation is more likely to involve potential founders or entrepreneurs as the primary agents.

Based on the arguments above, we develop the following hypothesis:

Hypothesis #1: *Startup size is positively associated with having individuals that previously worked at MNEs in the initial startup team, as founders or early joiners.*

2.2 MNE-experience and post-entry performance: a treatment effect

As argued above, a selection mechanism can explain a link between MNE experience and the initial quality of startups. The initial startup quality sets a potential for the post-entry performance of a startup, but realization of this potential requires additional competences and skills. We posit that there is a *treatment mechanism* responsible for the link between MNE experience and post-entry performance of startups which rests on the idea that individuals who left an MNE to found or join a new venture may have stronger chances of survival and growth because, in addition to the quality-effect, former MNE employees bring from the MNE some skills, mindset, resources and capabilities that impact the early organizational structure of the startup and its market potential and value creation prospects (Andersson and Klepper 2013, Bayus and Agarwal 2007, Colombo and Grilli 2005, Dencker et al. 2009, Groysberg et al. 2008, Kim et al. 2009, Kor 2003, Raffiee and Byun 2020). Like the selection mechanism consists of two sub-mechanisms, the treatment mechanism encompasses a set of three sub-mechanisms that refer to *experience and capabilities*, *financial resources, network and social capital*.

Experience and capabilities

First, experience and capabilities gained as MNE employees can foster startup growth through a diversified array of important channels, ranging from process optimization to innovation orientation, from business development to market-related strategy, from agility, adaptability, and scalability orientation to cross-cultural competences. MNEs often have well-established processes and systems to ensure efficiency across their operations. Former MNE employees can leverage their understanding of process optimization methodologies and bring discipline to the startup environment (Sørensen and Fassiotto 2011). They can help startups streamline operations, implement effective workflows, and employ more efficient processes, thus making startups more likely to grow (Haase and Eberl 2019, Qian et al. 2012).

Second, former MNE employees can also contribute their expertise in business development, market analysis, and partnership negotiations to startups (Colombo et al. 2004). They can help identify growth opportunities and develop market entry strategies. In particular, the timing of a startup's entry into new markets and the overall market conditions can influence its survival and growth. Launching a startup during favorable economic conditions or when there is a strong demand for innovative solutions can provide opportunities for rapid growth (Cassiman and Ueda 2006). Along this dimension, the former MNE employee can leverage their insider information on market conditions and opportunities and accordingly choose the right market as well as the right timing to entry. Startups operate in dynamic and rapidly changing environments, requiring them to be agile and adaptable. MNEs, too, face constant market shifts and need to respond quickly to changing customer demands and industry trends. Former MNE employees can bring their experience in navigating

complex and evolving landscapes, applying their adaptability and flexibility to help startups navigate challenges.

At the same time, while MNEs are typically large-scale organizations, both startups and MNEs focus on scalability (Reuber et al, 2021; Tippman et al., 2023). Startups aim to grow rapidly and expand their operations, while MNEs seek to scale their existing business models across different markets. Former MNE employees can contribute their knowledge of scaling strategies, processes, and best practices to help startups plan for growth. While startups typically start with a local or regional focus, they may aspire to expand globally in the future. These startups with global ambitions may encounter cross-cultural challenges as they expand into new markets. Former MNE employees who have experience working in diverse cultural settings can bring valuable cross-cultural competence to startups (Johnson et al. 2006; Caligiuri and Tarique 2012). They can help navigate cultural differences, develop effective communication strategies, and build relationships with stakeholders from different backgrounds.

Financial resources

Second, the financial resources available to the startup can determine its survival and growth prospect (Chandler and Hanks 1998, Davila et al. 2003). This includes funds raised from various sources such as personal savings, investments from friends and family, angel investors, venture capitalists, or government grants (Bertoni et al. 2011, Colombo et al. 2016). Former MNE employees may have greater access to capital due to higher-than-average individual financial wealth as well as the possibility to rely on a larger network of potential funders built during their position in the MNE (Elston and Audretsch 2010, Hurst and Lusardi 2004, Hvide and Møen 2010). Capital availability allows startups to invest in infrastructure, hire talented employees, develop prototypes, and execute marketing strategies on a larger scale, thus impacting prospect growth. Certainly, the capability to mobilize significant financial resources from the early stages of startup development can influence its initial size (Hvide and Møen 2010). However, given that capital requirements are likely to evolve throughout the startup life cycle, the availability of capital is more critical as a channel influencing treatment rather than as one influencing selection.

Network and social capital

Third, former MNE employees can usually leverage larger and more diversified networks as well as a higher valued social capital. Former MNE employees often have extensive professional networks built during their tenure with the MNE. They can leverage these networks to connect startups with potential customers, investors, mentors, and industry experts (Carias et al. 2023). Their existing relationships can provide valuable resources and opportunities for the startup to accelerate its growth. Networks and social capital can also be exploited as key resources to foster strategic partnerships and alliances, both commercial and in the realm of research and development (Aharonson et al. 2020). Partnerships and alliances with established companies or key stakeholders can impact startup growth. Collaborations with strategic partners can provide access to resources,

distribution channels, or customer bases, enabling startups to achieve a higher grow by leveraging MNEs' existing networks (Gaonkar and Moeen 2023). Differently from what happened for the selection mechanism, the relevance of the treatment mechanism is limited in time but not in scope. In fact, it is significant in the post-founding stages of the startup life cycle, but it involves both founders and other members of the founding team. Just as founders inherit from the MNE knowledge, competences and/or additional perspectives key to the startup success, so do other members of the founding team.
Based on these arguments above, we develop the following hypothesis:

Hypothesis #2: *Survival and growth of startup are positively associated with having individuals that previously worked at MNEs in the initial startup team, as founders or early joiners.*

3. DATA AND EMPIRICAL STRATEGY

3.1. Sources and data construction

The dataset in this study is created from various audited register databases through Microdata Online Access (MONA) at Statistics Sweden. With a unique anonymized identification number, we construct a matched employer-employee dataset by linking individual employees from the Longitudinal integrated database for health insurance and labour market (LISA)[6] and their employing firms from the Structural business database *(Företagens ekonomi)*. The LISA database contains information about the employee's salary, occupation, and education level, among others. The Structural business database contains accounting information of registered firms, such as profits, turnover, total employees, and industry classification codes.

We, then, complement this dataset by merging it with the Business Register database *(Företagsregistret)* to identify the location of the firms; the Corporate group register *(Koncernregistret)* to identify the ownership structure, for example whether a firm belongs to multinationals; Company and establishment dynamics register *(Registren för Företagens och arbetsställenas dynamik)* to distinguish new firms and establishments based on employment flows; and Foreign trade in goods database *(Utrikeshandel med varor)* for firm's exporting and importing activities.

The period of study is 2000-2014. However, we include the data from 1999 to capture the employees' MNE-experience from their prior employers before 2000; and the data from 2015-2019 to construct the 5-year firm size growth variable beyond 2014.

[6]For a description of the databases mentioned in this section, please refer to Statistics Sweden's website: https://www.scb.se/vara-tjanster/bestall-data-och-statistik/register/ (in Swedish).

3.2. Definition of startup and variables

New firms

The identification of a startup is based on a combination of the appearance of new firm id-codes (organization numbers) and information on employee-flows at the level of establishments between each pair of years. We employ an established method to identify genuinely new firms in the register data (Andersson and Arvidsson 2011).[7] Technically, a startup is identified as the combination of a new organization number as well as a new establishment.

We also impose two main restrictions. First, we only consider new firms that start as incorporated new firms. One reason for this is that new firms are truly heterogeneous, and research have shown that new firms that start as self-proprietorships often have different characteristics and motives than those that start as incorporated new firms. New firms with growth ambitions typically start as incorporated business (Tåg et al 2013, Fairlie and Miranda 2016) and are of generally higher 'quality' than self-proprietorships (Levine and Rubinstein 2017), which suggest that incorporated business start-ups more closely resemble what is referred to as entrepreneurship in the Schumpeterian tradition (Henrekson and Sanandaji 2013, 2014). By focusing our sample on incorporated new firms, we avoid comparing 'apples and oranges' and direct the focus towards new firms that are more likely to have growth ambitions.

Second, we restrict our analyses to new firms with at least five employees the initial year of operations. The reasons for this are technical, but also motivated based on previous empirical analyses. We are interested in the effect of labor market background of individuals in the initial team in a startup, i.e. founders and early joiners, which means that firms without employees (only a founder) are less interesting given our research questions. A minimum size of the startups also reduces heterogeneity, as previous research show that new firms that hire are typically more growth-oriented, have stronger business assets and intellectual property (Fairlie and Miranda 2017, Petrescu 2016).

Dependent variables

Our analyses focus on the initial startup size, survival, and post-entry growth. We subsequently develop three dependent variables:

- *initial startup size*: the number of employees the first year of operations of the startup.

- *survival*: the number of years the startup remains in operation.

[7]Statistics Sweden has developed the so-called FAD (Företagens och Arbetsställens Dynamik) coding scheme for establishments to distinguish various types of new firms based on worker flows (see Andersson and Arvidsson, 2011) and this has been employed in several empirical studies (see e.g. Andersson and Klepper 2013).

- *growth:* the percentage change of the total number of employees in the startup from the founding year, *t*, and *t*+2, *t*+4, and *t*+9, respectively.

Explanatory variables

We develop several explanatory variables that are motivated by previous conceptual and empirical research. Our focus is on whether having individuals in the start-up team who previously worked in MNEs has an impact on startup size, survival, and employment growth, respectively. To build indicators of MNE experience we first define the initial startup team. The initial startup team is defined as all employees in the new firm in the founding year *t*. This definition implies that the initial startup team includes both founders (that work in the startup the first year) as well as early joiners.

MNE experience

We then use the longitudinal matched employer-employee dataset to identify the prior employer of all individuals in the initial startup team. Two indicators of MNE-experience in the startup team are developed: (i) a dummy variable which is 1 if anyone in the initial startup team worked in the previous year in a MNE, 0 otherwise, and (ii) a variable reflecting the fraction of the individuals in the start-up team that has MNE work experience.

We also assess if the effect of MNE-experience depends on the position an individual had in an MNE. A large literature suggest that the accumulation of relevant knowledge, experience and skills depend on the position an individual has in a firm (Lazear 2004, Unger et al 2011, Andersson and Koster 2018). Managers and other higher-level positions are often claimed to be able to develop a broader set of skills that are transferable (and thus valuable for other firms) (Andersson et al 2022, Sofka et al 2014, Faria at al 2021). Against this backdrop we develop another set of indicators that identify what occupation an individual had while working in an MNE. Using information in the data on broad occupational categories (ISCO-88, 1-digit) we separate between the following types of positions in MNEs:[8]

- MNE-manager
    - a dummy which is 1 if any member of the initial startup team previously worked at an MNE as a manager (major group 1 according to ISCO-88), 0 otherwise.
- MNE-professionals and technicians
    - a dummy which is 1 if any member of the initial startup team previously worked at an MNE as a professional, technician or associate professional (major group 2 oir 3 ISCO-88), 0 otherwise.

[8] https://ec.europa.eu/eurostat/documents/1978984/6037342/ISCO-88-COM.pdf

- MNE-other professions
    - a dummy which is 1 if any member of the initial startup team previously worked at an MNE with any occupation other than major group 1,2 or 3 according to ISCO-88, 0 otherwise.

In addition, we also develop indicators that inform about the combination of individuals' education and MNE-experience. Education is an indirect way to account for workers position at their prior employer and we expect that better educated individuals are more likely to have had a higher-level position:

- MNE-tertiary education
    - a dummy which is 1 if any member of the initial startup team that has a university education ($\geq$ 3 years) previously worked at an MNE, 0 otherwise.

- MNE- non-tertiary education
    - a dummy which is 1 if any member of the initial startup team that does not have a tertiary education previously worked at an MNE, 0 otherwise. [9]

Finally, we also develop indicators of the overlap between the industry of the startup and the industry of the establishment that individuals worked at within the MNE. A large literature shows that having founders with experience form the same industry as the startup boosts post-entry performance (Chatterji 2009, Klepper 2011, Delmar and Shane 2006):

- MNE-same industry
    - a dummy which is 1 if any member of the initial startup team previously worked at an MNE within the same 2-digit NACE industry as the startup, 0 otherwise.

- MNE-different industry
    - a dummy which is 1 if any member of the initial startup team previously worked at an MNE in another 2-digit NACE industry than the startup, 0 otherwise.

All the variables above are also expressed as shares, i.e. the fraction of the individuals in the initial startup team that fulfills the respective criteria, and the all the results we present holds up irrespective of whether we define variables according to dummies or fractions.

[9] As a consequence of this definition, we can have 3 cases: a. founding teams composed of all tertiary educated employees (MNE-tertiary =1 and MNE-non-tertiary =0); b. founding teams composed of all non-tertiary educated employees (MNE-tertiary =0 and MNE-non-tertiary =1); c. founding teams composed of a combination of non-tertiary and tertiary educated employees (MNE-tertiary =1 and MNE-non-tertiary =1).

Other control variables

We control for several characteristics of individuals in the startup team. First, we control for the *average age* of the individuals in the initial startup team. Prior research show that the average age of a firm's employees is one determinant of innovation (Schubert and Andersson 2015, Pfeifer and Wagner 2014). One explanation for this is that younger employees are more inclined to adopt and adapt to recent technological skills or join firms with greater innovation potential (Ouimet and Zarutskie, 2014). Furtermore research shows that younger CEOs tend to have higher propensity to risk and more incentives to grow their firm (Barba Navaretti et al., 2022; Serfling, 2014). Using Swedish data, Andersson and Klepper (2013) show that the average age of employees in a startup has negative influence on employment growth. Second, we control for the *fraction of individuals in the startup team that has tertiary education*, defined as a university education of at least three years, with the expectation that startups with a higher fraction of highly educated individuals perform better (Colombo and Grilli 2005). Third, we include *average high school Grade Point Average (GPA)* of the individuals in the startup team. Highschool GPA is a recognized proxy for an individual's ability or ambition (Geiser and Santelices 2007, Grogger and Eide 1995, Miller 1998) and alleviates potential issues with that MNE-experience may reflect labor market sorting in the sense that "good people work for good firms" (Chatterji 2009).

The empirical analyses also control for several aspects of the labor market background of the individuals in the startup team, which is important to control for to single out the effect of MNE-experience. We compute the *fraction of the individuals in the startup team that previously worked in the same industry as the startup* to control for general industry experience beyond experience from working in an MNE in the same industry as the startup. We also include the *fraction of the individuals in the startup team that previously worked in a high-tech industry*. Many MNEs operate in high-tech industries and such industries often represent contexts in which employees learn about new technology and R&D. An additional control is the *average wage that individuals in the startup team had at their prior employer*. Average wage is a form of 'catch-all' variable that, conditional on average high school GPA and other controls, inform about the average overall prior positions and relevance of skills of the members of the startup team.

We also control for three overall characteristics of prior employers of individuals in the initial startup team. These are: employment size, productivity, and turnover. Prior literature shows that experience from large and productive firms can boost the post-entry performance of new firms (Andersson and Klepper 2013, Hvide 2009, Maliranta and Nurmi 2018). We compute the *average employment size, productivity, and turnover, respectively, of the prior employers of individuals in the startup team*. As MNEs often are large and productive, these control variables are also important to make sure that the indicators of MNE experience not just pick up the general effect of work-experience from large and productive firms. Likewise, we include the *fraction of individuals in the startup team that work in a position as a manager, professional or technician*. These

variables are included to make sure that the MNE-experience variables by occupation do not simply reflect a general effect of having had a position as manager or professional.

Finally, we control for whether the startup has engaged in *export* or *import* activities, as well as the total employment size of labor market region in which the startup is located. A large literature shows that exports and import activity is associated with firm performance and growth (see e.g. Cassiman and Golovko 2018, Castellani and Fassio, 2019; Halpern et al., 2015). The size of the local labor market region is a control variable motivated by a large literature on the influence that agglomeration economies have on firms (Rosenthal and Strange 2004, Andersson and Lööf 2011). The overall size of a region is a 'catch-all' variable that reflects the combined net effect of two overall effects – a positive influence from agglomeration economies through various types of local externalities and a negative effect from tighter competition in agglomerated areas with a higher density of (competing) firms.

3.3. Descriptive statistics

Table 1 presents the number of firms per year in the data as well as the number of firms that is founded each year. On average, about 870 firms are founded each year during the 15-year period 2000-2014 and we have in total 13,196 observations of new firms in the data. There are rather small variations in the number of firms that are founded each year, though it is evident that the number of new firms fell in the aftermath of the IT-crisis in the early 2000s as well as in the aftermath of the financial crisis after 2007/2008.

Table 1: Firm cohorts by year of establishment

Year	All firms*	Firms at Est. Year	Startups as a share of all firms
2000	10117	1228	12.1%
2001	6827	762	11.2%
2002	6315	688	10.9%
2003	5373	585	10.9%
2004	5403	624	11.5%
2005	5975	717	12.0%
2006	6378	791	12.4%
2007	8230	1025	12.5%
2008	7118	924	13.0%
2009	6269	827	13.2%
2010	6716	968	14.4%
2011	6750	1050	15.6%
2012	5909	986	16.7%
2013	5467	1006	18.4%
2014	4950	1015	20.5%
Total	**97797**	**13196**	

Note: Own computations based on audited firm-level register data from Statistics Sweden (SCB).
* All firms denote all non-affiliated incorporated firms with 5-49 employees in their establishment year.

Table 2 presents descriptive statistics for all variables in the empirical analyses. The average startup size is about 8 employees, with minimum of 5 (by definition) and a max just below 50 employees. Only a few startups are exporters (14%) or importers (27%). Judging by the number of observations on employment growth, it is evident that many firms do not survive throughout the entire period of time. For the short-run employment growth (3 years) we have 10,549 observations, for medium-run (5 years) 8,477 observations and for long-run 3,942 observations. The average employment growth at is 6.8% at 3 years, 14.6% at 5 years and 27.3% at 10 years.

Table 2: Descriptive statistics at the establishment year

Variable	Obs	Mean	Std. Dev.	Min	Max
EmploymentGrowth_3years	10549	0.068	0.787	-3.850	3.708
EmploymentGrowth_5years	8477	0.146	0.901	-3.784	4.379
EmploymentGrowth_10years	3942	0.273	1.094	-3.526	5.375
FirmSize (ln)	13196	2.039	0.460	1.609	3.892
Exporter (dummy)	13196	0.135	0.342	0	1
Importer (dummy)	13196	0.268	0.443	0	1
AverageAge (ln)	13196	3.472	0.208	2.890	4.251
AveragePreviousWage (ln)	13196	6.938	2.000	0	10.500
AverageSizePreviousFirm (ln)	13196	3.936	2.176	-1.609	9.892
AverageProductivityPreviousFirm (ln)	13196	11.181	4.218	0	16.424
AverageTurnoverPreviousFirm (ln)	13196	17.687	3.595	0	25.387
AverageHighschoolGrade	13196	11.090	4.531	0	20
GradeMissing (dummy)	13196	0.102	0.302	0	1
SameIndustryShare	13196	0.356	0.333	0	1
HightechShare	13196	0.022	0.090	0	1
TertiaryEducatedShare	13196	0.121	0.206	0	1
ManagerShare	13196	0.046	0.123	0	1
ProfessionalShare	13196	0.070	0.185	0	1
TechnicianShare	13196	0.095	0.189	0	1
MNE (dummy)	13196	0.543	0.498	0	1
MNEShare	13196	0.197	0.243	0	1
MNE_Manager (dummy)	13196	0.053	0.225	0	1
MNE_ProfessionalTechnician (dummy)	13196	0.151	0.358	0	1
MNE_OtherProfession (dummy)	13196	0.457	0.498	0	1
MNE_TertiaryEducated (dummy)	13196	0.133	0.340	0	1
MNE_NonTertiaryEducated (dummy)	13196	0.500	0.500	0	1
MNE_SameIndustry (dummy)	13196	0.165	0.371	0	1
MNE_DifferentIndustry (dummy)	13196	0.468	0.499	0	1
MNE_ManagerShare	13196	0.010	0.053	0	1
MNE_ProfessionalTechnicianShare	13196	0.043	0.126	0	1
MNE_OtherProfessionShare	13196	0.144	0.206	0	1
MNE_TertiaryEducatedShare	13196	0.035	0.111	0	1
MNE_NonTertiaryEducatedShare	13196	0.162	0.213	0	1
MNE_SameIndustryShare	13196	0.047	0.130	0	1
MNE_DifferentIndustryShare	13196	0.150	0.212	0	1
TotalEmployment_LA (ln)	13196	12.719	1.518	7.069	14.069

Note: Own computations based on audited firm-level register data from Statistics Sweden (SCB).

Looking at MNE experience we see that the mean of the MNE dummy is 0.543, which implies that just over 50% has at least one member of the initial startup team that previously worked at an MNE. This figure is

somewhat higher than the overall fraction of employees in Sweden that are employed in MNEs. A rather small fraction of startups has individuals in their initial startup team that previously worked at MNEs in a management position. The mean of the MNE_manager dummy is 0.053 which means that about 5% of the startups have such individuals in their initial startup team. The fraction is somewhat higher for professionals and technicians (15%), and highest for the remaining category "other professions" (46%). Likewise, the mean of the indicator of MNE-experience combined with tertiary education is 13% while it is 50% for non-tertiary education.

3.4. Empirical strategy

To analyze the relationship between MNE-experience and startup size and test Hypthesis 1, we employ a standard OLS regression to estimate the following model:

$$InitialStartupSize_i = \alpha + \beta_1 MNE_i + x_i'\beta + \mu_i + \varphi_t + \varepsilon_i, \quad (1)$$

where the independent variable is *InitialFirmSize*$_i$, *MNE*$_i$ denotes the MNE-variables, x_i consists of all control variables (see section 3.2 for description), μ_i and φ_t are industry and year dummies, respectively. We include different sets of *MNE* variables in our estimation models. First, we run a model which includes only the *MNE* dummy. The second model includes all MNE profession dummy variables (*MNE_Manager*, *MNE_ProfessionalTechnician*, and *MNE_OtherProfession*). The third model includes education background dummy variables of employees with MNE experience (*MNE_TertiaryEducated* and *MNE_NonTertiaryEducated*). Lastly, we run a model with dummies indicating the industry of employees with MNE experience, whether it is the same or different from the current employer (*MNE_SameIndustry* and *MNE_DifferentIndustry*)

To test Hypothesis 2 on the relationship between MNE-experience and survival/growth, we first employ the Cox proportional hazard model (Cox 1972). The model formulation is as follows:

$$\lambda(t|X_i) = \lambda_0(t)\exp\left(\beta_1 MNE_{it} + x_{it}'\beta + \mu_i + \varphi_t\right), \quad (2)$$

where $\lambda(\cdot)$ denotes the hazard function at time *t* for firm *i*, and all other variables are similar to the analysis on initial firm size, except that we include initial startup size as an additional control variable.

Lastly, our analysis also examines the growth rate of employment among these start-ups. In doing so, we regress with the OLS estimator the following model:

$$SizeGrowth_i = \alpha + \beta_1 MNE_i + x_i'\beta + \mu_i + \varphi_t + \varepsilon_i, \quad (3)$$

where *SizeGrowth*$_i$ denotes the growth rate of employment size during the first 3, 5, and 10 years. Because not all firms survive in successive years, the total number of observations decreases as we estimate the size growth in 3, 5, and 10 years of existence, respectively, as can be appreciated from Table 2.

4. RESULTS

This section presents the results of the estimations of our regression analyses (see section 3.4). We start by presenting results for startup size, then survival and lastly post-entry growth. We then present and discuss robustness tests.

4.1. Start-up size

Table 3 presents OLS regression results of the analysis of the relationship between MNE-experience and initial start-up size. Turning first to the variables of main interest, MNE-experience, we find support for our Hypotheses 1 (column 1). There is a statistically significant positive relationship between MNE-experience and startup size. Startups with individuals that have MNE-experience in their initial startup team are larger in the founding year. Columns (2)-(5) report results when we separate MNE-experience based on broad occupation groups, education, and same industry. These results point to that the estimated relationship between startup size and MNE-experience is not conditional on which position an individual had on the MNE or his/her education level. The effect of MNE-experience is positive and significant. Column (5) reveals that experience as a manager in a MNE among the founding team has a stronger correlation with startup size, but differences with other positions are relatively small. A significant difference seem to emerge between MNE-experience of tertiary vs. non-tertirary educated employees. The effect of having individuals in the initial startup team with prior work-experience from an MNE in the same industry as the startup is large and significant, but quantitatively not different from the effect of the experience in other industries. Taken together, these results are consistent with the hypothesis that there is a *selection effect* that links MNE-experience to initial start-up quality.

Turning to the control variables, our results are broadly consistent with prior literature. Younger initial startup teams tend to found larger startups. Having a higher share of the individuals in the initial startup team with experience form the same industry as the startup is associated with larger startup size. We also find that the average prior wage and the average size of the prior employer of the members of the initial startup team has a positive and statistically significant association with startup size. Startups that are internationalized though importing activity are also generally larger in the founding year. These results lend support to that the combined labor-market background of the initial startup team influence the initial quality of startups.

Table 3: OLS regression results on firm establishment size.

VARIABLES	(1)	(2)	(3)	(4)	(5)
MNE (dummy)	0.175***				
	(0.009)				
MNE_Manager (dummy)		0.187***			0.135***
		(0.022)			(0.023)
MNE_ProfessionalTechnician (dummy)		0.152***			0.062***
		(0.014)			(0.020)
MNE_OtherProfession (dummy)		0.198***			0.098***
		(0.009)			(0.019)
MNE_TertiaryEducated (dummy)			0.207***		0.088***
			(0.016)		(0.020)
MNE_NonTertiaryEducated (dummy)			0.186***		-0.034
			(0.009)		(0.021)
MNE_SameIndustry (dummy)				0.200***	0.136***
				(0.013)	(0.019)
MNE_DifferentIndustry (dummy)				0.204***	0.129***
				(0.009)	(0.020)
AverageAge (ln)	-0.153***	-0.152***	-0.156***	-0.148***	-0.149***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
SameIndustryShare	0.037***	0.037***	0.036***	0.015	0.017
	(0.012)	(0.012)	(0.012)	(0.013)	(0.012)
HightechShare	-0.101**	-0.117***	-0.104**	-0.106***	-0.114***
	(0.041)	(0.041)	(0.041)	(0.041)	(0.040)
TertiaryEducatedShare	-0.019	-0.030	-0.103***	-0.036	-0.121***
	(0.023)	(0.023)	(0.025)	(0.023)	(0.025)
AveragePreviousWage (ln)	0.020***	0.017***	0.017***	0.018***	0.016***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
AverageSizePreviousFirm (ln)	0.028***	0.019***	0.023***	0.018***	0.016***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
AverageProductivityPreviousFirm (ln)	0.001	0.001	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
AverageTurnoverPreviousFirm (ln)	-0.002	-0.002	-0.004	-0.003	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Exporter (dummy)	0.036	0.029	0.030	0.020	0.023
	(0.023)	(0.023)	(0.023)	(0.023)	(0.022)
Importer (dummy)	0.066***	0.057***	0.058***	0.058***	0.054***
	(0.016)	(0.015)	(0.015)	(0.015)	(0.015)
AverageHighschoolGrade	-0.002	-0.003**	-0.003**	-0.003*	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GradeMissing (dummy)	-0.118***	-0.121***	-0.125***	-0.115***	-0.120***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
ManagerShare	-0.091***	-0.173***	-0.106***	-0.103***	-0.172***
	(0.025)	(0.027)	(0.025)	(0.025)	(0.027)
ProfessionalShare	-0.109***	-0.107***	-0.112***	-0.123***	-0.117***
	(0.024)	(0.025)	(0.023)	(0.023)	(0.025)
TechnicianShare	-0.143***	-0.168***	-0.154***	-0.156***	-0.158***
	(0.019)	(0.020)	(0.019)	(0.019)	(0.020)
TotalEmployment_LA (ln)	0.011***	0.010***	0.009***	0.009***	0.009***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Constant	2.004***	2.077***	2.096***	2.056***	2.110***
	(0.094)	(0.093)	(0.093)	(0.093)	(0.093)
Observations	13,205	13,205	13,205	13,205	13,205
R-squared	0.158	0.183	0.178	0.185	0.193

Note: Robust standard errors in parentheses; Two-digit industry codes and year dummies included in all regressions but not reported. *** p<0.01, ** p<0.05, * p<0.1. *GradeMissing dummy* refers to a dummy variable which is one firms in which no member of the initial startup teams has information in high school GPA. This is true for about 10% of the new firms in the sample.

4.2. Survival

Table 4 presents results of estimations of a Cox-proportional hazard model. The results show that there is no robust statistically significant effect of MNE-experience on the survival rate of new firms. The overall dummy for MNE-experience is insignificant (columns 1), and this is also true for MNE-experience by occupation and education (columns 2-5). There is only a statistically weak relationship between MNE-experience as professional/technician, but the significance of this effect is reduced in the full model when all types of MNE-experience are included (column 6). One explanation for this result is that the survival model includes initial startup size as a determinant and the estimated effect of MNE-experience on survival may go through start-ups size, given the strong association between startup size and MNE-experience (see Section 4.1). Conditional on startup size, having workers from MNEs in the initial startup team has no independent effect on survival.

Table 4: Cox-proportional hazard results on firm survival

VARIABLES	**(1)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
MNE (dummy)	0.905	0.944				
	(0.078)	(0.082)				
MNE_Manager (dummy)			1.119			1.134
			(0.211)			(0.218)
MNE_ProfessionalTechnician (dummy)			0.719**			0.722*
			(0.100)			(0.130)
MNE_OtherProfession (dummy)			0.993			1.009
			(0.086)			(0.190)
MNE_TertiaryEducated (dummy)				0.918		0.931
				(0.122)		(0.152)
MNE_NonTertiaryEducated (dummy)				0.930		0.815
				(0.078)		(0.156)
MNE_SameIndustry (dummy)					0.922	1.059
					(0.104)	(0.149)
MNE_DifferentIndustry (dummy)					0.990	1.220
					(0.083)	(0.205)
FirmSize (ln)		0.782***	0.788***	0.790***	0.783***	0.786***
		(0.067)	(0.069)	(0.069)	(0.068)	(0.069)
AverageAge (ln)	1.228	1.169	1.193	1.173	1.172	1.195
	(0.225)	(0.214)	(0.218)	(0.215)	(0.214)	(0.219)
SameIndustryShare	0.633***	0.639***	0.640***	0.639***	0.655***	0.655***
	(0.075)	(0.075)	(0.075)	(0.075)	(0.081)	(0.081)
HightechShare	0.613	0.598	0.610	0.602	0.588	0.603
	(0.245)	(0.235)	(0.240)	(0.236)	(0.232)	(0.237)
TertiaryEducatedShare	0.784	0.780	0.788	0.805	0.780	0.756
	(0.174)	(0.170)	(0.171)	(0.189)	(0.169)	(0.178)
AveragePreviousWage (ln)	0.896***	0.899***	0.898***	0.899***	0.899***	0.898***
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
AverageSizePreviousFirm (ln)	0.915***	0.922***	0.922***	0.925***	0.921***	0.923***

	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
AverageProductivityPreviousFirm (ln)	0.967*	0.968*	0.970*	0.968*	0.969*	0.970*
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
AverageTurnoverPreviousFirm (ln)	1.040**	1.039**	1.038**	1.039**	1.038**	1.037*
	(0.020)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Exporter (dummy)	0.909	0.916	0.915	0.916	0.921	0.915
	(0.173)	(0.175)	(0.175)	(0.175)	(0.176)	(0.175)
Importer (dummy)	0.871	0.886	0.881	0.891	0.888	0.885
	(0.111)	(0.112)	(0.112)	(0.113)	(0.113)	(0.113)
AverageHighschoolGrade	0.941***	0.942***	0.943***	0.943***	0.942***	0.943***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
GradeMissing (dummy)	0.759	0.755	0.759	0.757	0.755	0.759
	(0.162)	(0.160)	(0.160)	(0.160)	(0.160)	(0.160)
ManagerShare	0.617	0.611	0.590	0.615	0.613	0.588
	(0.201)	(0.196)	(0.207)	(0.197)	(0.198)	(0.207)
ProfessionalShare	0.870	0.854	1.003	0.860	0.860	1.013
	(0.205)	(0.199)	(0.241)	(0.201)	(0.202)	(0.247)
TechnicianShare	0.616**	0.601**	0.724	0.605**	0.601**	0.729
	(0.141)	(0.135)	(0.170)	(0.136)	(0.135)	(0.173)
TotalEmployment_LA (ln)	1.047**	1.050**	1.051**	1.050**	1.050**	1.051**
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Observations	12,042	12,042	12,042	12,042	12,042	12,042
N_fail	987	987	987	987	987	987
ll	-8380	-8376	-8373	-8376	-8376	-8372
r2_p	0.0168	0.0173	0.0176	0.0173	0.0173	0.0177
chi2	43320	315.9	156383	317.1	315.3	155385

Note: Robust standard errors in parentheses, Two-digit industry codes and year dummies included in all regressions but not reported. *** p<0.01, ** p<0.05, * p<0.1. *GradeMissing dummy* refers to a dummy variable which is one firms in which no member of the initial startup teams has information in high school GPA. This is true for about 10% of the new firms in the sample.

As for the control variables we find that large startups are less likely to exit, which is an established finding in prior literature. We also find that a larger fraction of individuals in the startup with prior work experience in the same industry (2-digit NACE) as the startup is associated with lower hazard, i.e. higher survival rate. This result is also consistent with prior literature and points to the role of industry experience in boosting the post-entry performance of startups (Erikson and Kuhn 2006). In addition, having individuals in the startup team with higher wages at their prior employers and who also previously worked at large employers also appear to benefit survival. Furthermore, the average high school GPA of the members of the initial startup team is associated with lower hazard. Taken together, these results are consistent with a positive impact of experience form large resourceful firms, human capital as well as industry experience.

4.3. Post-entry growth

Table 5, 6 and 7 present results of the OLS estimation of equation (3) where the dependent variable is employment growth over different time horizons (3, 5 and 10 years, respectively). Startups where the founding team include anyone with some previous working experience in an MNE grow 3.8 percentage points faster at

3-year, but no difference is found at 5 and 10 years. However, significant differences are observed when the MNE dummy is broken down by position, education and industry experience. When all dimensions are considered together (column 5), experience as an MNE manager within the founding team is the single most important factors that can boost startup growth. Startups where a founder or an early joiner has some previous experience as an MNE manager grow 14.2 percentage point faster than the baseline at 3 years (11.4 at 5 years and 19.8 at 10 years). Results on the 3-year growth are robust to restricting the sample to firms that survive for 5 and 10 years (Table 8).

Control variables have largely the expected signs and significance. Larger and younger startup grow faster (Coad, 2009). In general, startups with stronger founding teams - such as those with a higher share of tertiary educated employees, of manager and with employees that scored higher in their GPAs and receiving higher wages in previous jobs - and founding teams with experience in stronger firms - e.g. larger firms showing higher productivity levels - also achieve higher employment growth.

Table 1: OLS regression results on 3-year firm size growth

VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
MNE (dummy)	0.038*				
	(0.020)				
MNE_Manager (dummy)		0.164***			0.142***
		(0.035)			(0.037)
MNE_ProfessionalTechnician (dummy)		0.099***			0.059*
		(0.028)			(0.035)
MNE_OtherProfession (dummy)		0.003			-0.049
		(0.020)			(0.038)
MNE_TertiaryEducated (dummy)			0.099***		0.056
			(0.031)		(0.036)
MNE_NonTertiaryEducated (dummy)			0.038*		0.037
			(0.020)		(0.040)
MNE_SameIndustry (dummy)				0.055**	0.023
				(0.023)	(0.031)
MNE_DifferentIndustry (dummy)				0.042**	0.020
				(0.019)	(0.035)
FirmSize (ln)	-0.142***	-0.154***	-0.151***	-0.150***	-0.158***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
AverageAge (ln)	-0.108**	-0.120***	-0.110**	-0.109**	-0.121***
	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)
SameIndustryShare	0.109***	0.105***	0.108***	0.100***	0.102***
	(0.025)	(0.025)	(0.025)	(0.027)	(0.027)
HightechShare	0.039	0.034	0.033	0.039	0.034
	(0.088)	(0.088)	(0.089)	(0.088)	(0.089)
TertiaryEducatedShare	0.202***	0.191***	0.141**	0.198***	0.163***
	(0.049)	(0.049)	(0.055)	(0.049)	(0.056)
AveragePreviousWage (ln)	0.033***	0.031***	0.032***	0.033***	0.031***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
AverageSizePreviousFirm (ln)	0.040***	0.039***	0.039***	0.038***	0.037***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
AverageProductivityPreviousFirm (ln)	0.009	0.008	0.009	0.009	0.008
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
AverageTurnoverPreviousFirm (ln)	-0.020***	-0.019***	-0.020***	-0.019***	-0.019***

	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Exporter (dummy)	-0.006	-0.006	-0.007	-0.010	-0.007
	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)
Importer (dummy)	0.096***	0.093***	0.092***	0.094***	0.091***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
AverageHighschoolGrade	0.011***	0.010***	0.010***	0.010***	0.010***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
GradeMissing (dummy)	0.158***	0.149***	0.154***	0.158***	0.148***
	(0.054)	(0.054)	(0.054)	(0.054)	(0.054)
ManagerShare	0.325***	0.204***	0.317***	0.321***	0.202***
	(0.060)	(0.062)	(0.060)	(0.060)	(0.062)
ProfessionalShare	0.193***	0.130**	0.187***	0.188***	0.122**
	(0.052)	(0.055)	(0.052)	(0.052)	(0.056)
TechnicianShare	0.012	-0.056	0.006	0.007	-0.056
	(0.046)	(0.049)	(0.046)	(0.046)	(0.050)
TotalEmployment_LA (ln)	-0.002	-0.002	-0.003	-0.002	-0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Constant	0.267	0.374*	0.325	0.299	0.403*
	(0.210)	(0.211)	(0.211)	(0.210)	(0.212)
Observations	10,558	10,558	10,558	10,558	10,558
R-squared	0.077	0.080	0.078	0.077	0.080

Robust standard errors in parentheses; Two-digit industry codes and year dummies included in all regressions but not reported. *** p<0.01, ** p<0.05, * p<0.1. *GradeMissing dummy* refers to a dummy variable which is one firms in which no member of the initial startup teams has information in high school GPA. This is true for about 10% of the new firms in the sample.

Table 2: OLS regression results on 5-year firm size growth

VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
MNE (dummy)	-0.003				
	(0.025)				
MNE_Manager (dummy)		0.132***			0.114**
		(0.046)			(0.048)
MNE_ProfessionalTechnician (dummy)		0.133***			0.114**
		(0.036)			(0.046)
MNE_OtherProfession (dummy)		-0.028			-0.042
		(0.025)			(0.050)
MNE_TertiaryEducated (dummy)			0.111***		0.085*
			(0.039)		(0.047)
MNE_NonTertiaryEducated (dummy)			0.018		0.093*
			(0.025)		(0.054)
MNE_SameIndustry (dummy)				0.053*	-0.017
				(0.030)	(0.040)
MNE_DifferentIndustry (dummy)				-0.011	-0.092**
	-0.162***	-0.176***	-0.175***	-0.166***	-0.176***
FirmSize (ln)	(0.025)	(0.026)	(0.025)	(0.025)	(0.026)
	-0.226***	-0.245***	-0.230***	-0.227***	-0.247***
AverageAge (ln)	(0.055)	(0.056)	(0.056)	(0.055)	(0.056)
	0.093***	0.091***	0.094***	0.072**	0.075**
SameIndustryShare	(0.032)	(0.032)	(0.032)	(0.034)	(0.034)
	0.196*	0.179	0.183	0.203*	0.189
HightechShare	(0.114)	(0.115)	(0.115)	(0.114)	(0.115)
	0.200***	0.186***	0.123*	0.198***	0.167**

TertiaryEducatedShare	(0.064)	(0.064)	(0.070)	(0.064)	(0.070)
	0.030**	0.028**	0.029**	0.030**	0.027**
AveragePreviousWage (ln)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
	0.059***	0.056***	0.055***	0.057***	0.055***
AverageSizePreviousFirm (ln)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
	0.007	0.007	0.009	0.008	0.007
AverageProductivityPreviousFirm (ln)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
	-0.027***	-0.026***	-0.028***	-0.026***	-0.026***
AverageTurnoverPreviousFirm (ln)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
	0.024	0.022	0.024	0.022	0.023
Exporter (dummy)	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)
	0.112***	0.110***	0.107***	0.109***	0.106***
Importer (dummy)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)
	0.000	-0.000	-0.000	0.000	-0.000
AverageHighschoolGrade	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
	0.010	0.002	0.009	0.012	0.002
GradeMissing (dummy)	(0.067)	(0.067)	(0.067)	(0.067)	(0.067)
	0.241***	0.124	0.230***	0.235***	0.126
ManagerShare	(0.082)	(0.086)	(0.082)	(0.082)	(0.086)
	0.335***	0.237***	0.324***	0.328***	0.235***
ProfessionalShare	(0.069)	(0.072)	(0.069)	(0.069)	(0.072)
	0.146**	0.043	0.138**	0.142**	0.044
TechnicianShare	(0.060)	(0.064)	(0.060)	(0.060)	(0.065)
	0.002	0.001	0.001	0.001	0.001
TotalEmployment_LA (ln)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
	0.106	0.100	0.107	0.103	0.100
Constant	0.826***	0.986***	0.918***	0.853***	1.007***
	(0.275)	(0.277)	(0.276)	(0.275)	(0.277)
Observations	8,486	8,486	8,486	8,486	8,486
R-squared	0.083	0.087	0.085	0.084	0.088

Robust standard errors in parentheses; Two-digit industry codes and year dummies included in all regressions but not reported. *** p<0.01, ** p<0.05, * p<0.1. *GradeMissing dummy* refers to a dummy variable which is one firms in which no member of the initial startup teams has information in high school GPA. This is true for about 10% of the new firms in the sample.

Table 3: OLS regression results on 10-year firm size growth

VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
MNE (dummy)	-0.001				
	(0.045)				
MNE_Manager (dummy)		0.260***			0.198**
		(0.083)			(0.087)
MNE_ProfessionalTechnician (dummy)		0.126**			0.022
		(0.064)			(0.083)
MNE_OtherProfession (dummy)		-0.008			-0.102
		(0.045)			(0.088)
MNE_TertiaryEducated (dummy)			0.223***		0.164*
			(0.072)		(0.085)
MNE_NonTertiaryEducated (dummy)			0.035		0.047
			(0.044)		(0.096)
MNE_SameIndustry (dummy)				0.153***	0.118
				(0.054)	(0.073)
MNE_DifferentIndustry (dummy)				0.031	0.028

				(0.044)	(0.082)
FirmSize (ln)	-0.210***	-0.241***	-0.238***	-0.232***	-0.251***
	(0.044)	(0.045)	(0.044)	(0.044)	(0.045)
AverageAge (ln)	-0.517***	-0.543***	-0.524***	-0.522***	-0.545***
	(0.099)	(0.100)	(0.099)	(0.099)	(0.100)
SameIndustryShare	0.184***	0.184***	0.184***	0.137**	0.142**
	(0.056)	(0.056)	(0.056)	(0.060)	(0.060)
HightechShare	0.101	0.084	0.078	0.105	0.097
	(0.177)	(0.179)	(0.178)	(0.177)	(0.179)
TertiaryEducatedShare	0.482***	0.461***	0.331**	0.473***	0.364***
	(0.117)	(0.117)	(0.129)	(0.117)	(0.131)
AveragePreviousWage (ln)	0.057**	0.052**	0.055**	0.055**	0.050**
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
AverageSizePreviousFirm (ln)	0.064***	0.057***	0.057***	0.052***	0.054***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
AverageProductivityPreviousFirm (ln)	0.013	0.012	0.015	0.014	0.013
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
AverageTurnoverPreviousFirm (ln)	-0.031***	-0.030***	-0.034***	-0.030***	-0.031***
	(0.011)	(0.012)	(0.012)	(0.011)	(0.012)
Exporter (dummy)	0.098	0.099	0.106	0.090	0.100
	(0.091)	(0.091)	(0.091)	(0.091)	(0.091)
Importer (dummy)	0.045	0.036	0.034	0.035	0.025
	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)
AverageHighschoolGrade	-0.003	-0.004	-0.004	-0.003	-0.004
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
GradeMissing (dummy)	-0.171	-0.176	-0.176	-0.157	-0.172
	(0.136)	(0.135)	(0.135)	(0.136)	(0.135)
ManagerShare	0.295**	0.087	0.267**	0.275**	0.087
	(0.133)	(0.138)	(0.132)	(0.132)	(0.138)
ProfessionalShare	0.217*	0.127	0.195	0.196	0.113
	(0.123)	(0.129)	(0.123)	(0.123)	(0.130)
TechnicianShare	0.055	-0.034	0.041	0.041	-0.022
	(0.099)	(0.105)	(0.099)	(0.099)	(0.106)
TotalEmployment_LA (ln)	0.012	0.010	0.009	0.009	0.009
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Constant	1.524***	1.775***	1.721***	1.649***	1.858***
	(0.478)	(0.484)	(0.482)	(0.479)	(0.486)
Observations	3,943	3,943	3,943	3,943	3,943
R-squared	0.105	0.109	0.108	0.107	0.111

Robust standard errors in parentheses; Two-digit industry codes and year dummies included in all regressions but not reported. *** p<0.01, ** p<0.05, * p<0.1. *GradeMissing dummy* refers to a dummy variable which is one firms in which no member of the initial startup teams has information in high school GPA. This is true for about 10% of the new firms in the sample.

5. Discussion and conclusions

In this paper we have shown that individuals with previous experience as employees in an MNE typically join or found startups of larger initial size. We have also shown that startups with individuals with MNE experience in the initial team grow more in the short, medium and long run. While the association between MNE experience and initial startup size applies to any kind of worker with previous MNE experience, the positive effect of MNE experience on growth mainly applies to workers who previously had a managerial or professional position in the MNE. We do not find instead a positive effect of MNE experience on start up survival rate, but since startup initial size has a strong and positive effect on survival, and MNE experience is positively correlatd with startup size, we interpret this result as that the effect of MNE-experience on survival goes through start-ups size.

These results suggest that MNE workers can be an important source of human capital for startups in their initial years after entry, especially MNE workers with managerial competences developed during their previous career as MNE managers.

Our results are in line with our theoretical expectations: we posit the existence of a pre-entry selection effect that drives the choice of MNE employees to join or fund a startup and which leads them to leave their existing company for startups of larger initial size. This is due to two reasons. First because of the high opportunity costs of leaving a career in a large multinational firm: MNE employees choose to leave only when the quality and business potential of a startup outweights those costs, and startup initial size is known to be a good proxy of its quality. Secondly MNE employees may fund startup of higher initial size and hence larger initial investments, because during their spell at the MNE they may be able to generate and validate business ideas of higher quality, for which they are willing to invest a higher amount of financial resources.

Our second theoretical contribution is related to the existence of a post-entry treatment effect, according to which the presence of individuals with MNE experience in the initial team of a startup is likely to increase its future growth. This treatment effect is driven by 3 main factors. First, MNE employees, especially MNE managers, have accumulated important competences during their work at the MNE which may substantially help them in scaling up a business, Secondly, MNE employees may have larger financial resources or may have access to funders kn own during their previous spell in the MNE: by allowing to hire more qualified workers, have better infrastructure and execute marketing strategies on a larger scale this can also have a positive effect on future growth. Third the pre-existing network of contacts of MNE employees can be used by startups to build strategic partnerships with the MNE itself or with other actors of the MNE networks, which again can foster the growth of a startup.

Policy implications

From a policy perspective it becomes clear that mobility flows between MNEs and startups can bring positive spillover effects, in which the possibility for startups to hire individuals with previous MNE experience (especially MNE managers) leads to the creation of new and successful firms. Policy makers could then

consider the introduction of measures aimed at decreasing the opportunity costs for workers who leave MNEs. In this respect tax discounts for individuals that join a startup could decrease such opportunity costs. Additionally, policy could offer more generous unemployment benefits for individuals who joined a startup after leaving an MNE, in case the startup fails.

These measures should be especially at stake in the cases in which an MNE decides to shut down one of its subsidiaries in the host country: all the former employees of the MNEs who need to find a new job may be an important source of talents and of high level human capital for startups.

Also, policy makers could consider an intervention on the non-compete clauses of employment contracts by MNE employers. Non-compete clauses often deterr MNE workers from leaving their companies for other employers. Considering that startups are rarely a direct competitor for MNEs, policy makers may try to make sure that such non-compete clauses do not apply when MNE employees join a startup.

These considerations should be kept in mind by policy makers also when it comes to the attraction of FDIs: policy makers could keep into account that the MNEs that they may attract in a specific region could also train the future workers of the next generation of startups. Hence their choices in attracting FDI should also keep in mind not only the short-run consequences of having an advanced manufacturer in a region, but also its long-term future possible consequences in terms of new firm creation.

Managerial implications

Our results show that for founders of startups having experienced MNE workers in the initial team can be an important prerequisite for future growth prospects. Startups that wish to recruit MNE workers need to compensate in some ways for their high opportunity costs of leaving their company. Since the offer of very high salary is not easy for startups, another way to do this is to allow former MNE employees to fully participate to the potential gains of the business, i.e. adding the possibility to increase the salary based on the profits or the revenues of the startup. Also locating closer to the establishments of MNEs may increase the chances for startups to attract some of their employers, as this again may decrease their opportunity costs of leaving the MNE.

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