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Wage and competition channels of foreign direct investment and new firm entry

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Abstract Using a rich data set of the Dutch manufacturing sector between 1995 and 2010, we investigate the effect of foreign direct investment (FDI) on domestic new firm entry. The emerging empirical literature has focused on the direct relationship between FDI and entry, but has not explored the mechanisms behind the observed effect. Drawing on a simultaneous equations model, our analysis features both the direct effect of FDI as well as indirect effects through two channels: industry competition and wages. We estimate the parameters through 3SLS and take into account the endogeneity of competition and wages with respect to entry. Our results show that there is a significant negative direct effect of FDI on entry. At the same time, FDI decreases competition and increases wage levels, which then impact entry positively and negatively, respectively. The total effect of FDI is negative, but small and virtually disappears after one year. Policy implications are discussed.

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1 Introduction

Foreign direct investment (FDI) has attracted considerable attention from scholars and policy-makers alike, and its size is seen as a key indicator of a country's integration into the world economy. This positive attitude towards FDI is based on the conviction that it shifts resources to more efficient uses and disseminates best practices in several domains. That is, the flow of capital, technology, knowledge, and skills across national boundaries is expected to create a multitude of opportunities in host countries (Caves 2007; Javorcik 2004; Kokko et al. 1996). The early literature linking FDI to local development predominantly addresses productivity effects on domestic firms (Dunning and Lundan 2008). The emphasis has recently shifted to a related topic: the potential impact of FDI on domestic entrepreneurship. A handful of studies exist (see, Barbosa and Eiriz 2009; De Backer and Sleuwaegen 2003; Ayyagari and Kosová 2010; Lee et al. 2014; Danakol et al. 2017) that investigate the relationship between FDI and entrepreneurship. However, the available empirical evidence is inconclusive on whether and how much FDI influences entrepreneurship. Moreover, the existing literature

fails to analyze the mechanisms behind the observed relationship. This paper is positioned to fill this gap in the literature.

FDI may affect new firm entry simultaneously through various channels. On the one hand, foreign firms equipped with superior technology bring in technical expertise to the host economies. Foreign-owned enterprises can act as external sources of innovation and providers of tacit knowledge that can penetrate domestic firms and entrepreneurs, paving the way for new firm creation. Knowledge may reach local entrepreneurs through labor mobility, demonstration, exports, or training of suppliers. Therefore, foreign firms, willingly or unwillingly, become involved in the birth of domestic businesses (Görg and Strobl 2002; Barrios et al. 2005). On the other hand, a large foreign presence can also coincide with the crowding-out of domestic enterprises, for example, due to intensified competition in product markets (De Backer and Sleuwaegen 2003). Likewise, by paying higher wages, foreign-owned enterprises may increase the incentives for wage employment as opposed to entrepreneurship, thereby making new firm creation less attractive. An increase in FDI presence could also lead to higher barriers to entry, thereby constraining new firm creation (Danakol et al. 2017).

Specifically, this study focuses on two prominent channels—industry competition and wage levels through which FDI can potentially affect entrepreneurial activities. We propose that FDI is indirectly related to new firm creation through a direct effect on the levels of competition[1] and wages, which, in turn, reflects the rates of entrepreneurship. With regard to industry competition, the first channel, several advantages (i.e., advanced technology, product differentiation, scale economies, organizational capabilities) enable foreign firms to enter and expand quickly in local markets, altering competition between incumbents. Previous studies confirm that the degree of competition is a key factor in determining the rates of firm entry, although the direction of this effect is not always clear-cut (Geroski 1995) and warrants additional empirical verification.

[1]The assumption maintained throughout this paper is that lower (higher) industry concentration is regarded as proxying more (less) competition. This is a widely used approach in relevant studies. For the theoretical foundation of our choice, please see Appendix A.

Regarding wage levels, the second channel, several papers have concluded that foreign firms often pay higher wages even after controlling for the quality of the workforce (Görg and Greenaway 2004). This may be due to, for example, having limited knowledge of the local labor market, or incentives to prevent information leakage which could strengthen the position of local rivals. Furthermore, by attracting innovative human capital, foreign firms may reduce local labor supply, increasing wages across the whole industry. A larger foreign presence in host country industries is usually associated with higher wages (Chen et al. 2011). If higher wages motivate potential entrepreneurs to choose wage employment more often, the whole industry will experience lower domestic new firm entry.

Our study empirically investigates the role of FDI in explaining the rates of new firm formation through its effects on competition and wage levels in manufacturing industries in the Netherlands. We use firm-level panel data from CBS (Centraal Bureau voor de Statistiek/Statistics Netherlands) that is aggregated to the five-digit NACE rev. 1.1 industry level. Our sample is an unbalanced panel comprising 3784 industry-year observations of 252 industries over the 1995–2010 period. To evaluate whether FDI is directly and/or indirectly related to domestic firm entry via the wage and competition channels, we formulate a system of three structural equations. We estimate these simultaneous equations by using three-stage least square (3SLS). This technique allows entry rates, competition and wage levels to be determined concurrently within the system.

We derive four main results from the analysis where domestic entrepreneurship is measured as the rate of gross new firm entry at the five-digit NACE level. Specifically, entry rates:

i) are negatively associated with wage levels which are found to be higher in industries with increased FDI: a 10% increase in wages due to FDI coincides with a decrease of 3.6% in entry rates.
ii) are positively associated with the degree of concentration which is also higher in industries with larger FDI: a 10% increase in concentration due to FDI coincides with an increase of 4.4% in entry rates.
iii) are negatively associated with FDI once the effects via wage and concentration channels are

isolated: a 10 percentage point increase in FDI reduces entry rates by 0.4 percentage points or nearly 6% of the average entry rate.

iv) Finally, the total effect of FDI (direct effect and effects via channels are combined) is negative, but small and negligible after 1 year.

To check for robustness, we replicate the analysis using a sample excluding one-(wo)man businesses. We observe no major deviations from our original results. Furthermore, we distinguish between high- and low-tech industries. We found striking differences in the way FDI affects gross entry rates across these two subsamples. Specifically, the negative effect of FDI on domestic entrepreneurship features strongly in low-tech industries but not in high-tech sectors.

This study contributes to the emerging research stream on the nexus between FDI and domestic firm entry in several ways. *To begin with*, our study is the first to provide empirical evidence on this issue in the Dutch context. Despite its small size, the Netherlands attracts sizable FDI inflows. The corresponding figure was approximately US$154 billion in 2016, which is equivalent to 19.8% of its GDP (data from the World Bank). Such a large share of FDI requires continuous monitoring and evaluation of its potential benefits and risks by policy-makers. Our results are of high relevance in this regard. It is also valuable to consider the Dutch context since the country is a member of the European Union (EU), where increased integration of national practices is a shared goal for all involved. The unification of policies also encompasses issues related to entrepreneurship and FDI, suggesting that the member states tend to become more homogeneous in the respective domains over time. Therefore, despite the single country approach, the analysis of the Dutch case has relevance for other countries in the union, particularly for its core members. In relation to the available evidence, De Backer and Sleuwaegen (2003) is the closest work to ours both in terms of country similarity and reported results. Drawing on firm-level data from Belgium, also a small open economy, this paper reveals a crowding-out effect of FDI on entry rates in the manufacturing sectors over the period 1990–1995.

Second, the use of a simultaneous equations model is novel to this particular domain. To the best of our knowledge, we are the first to employ a multi-equation framework to capture the channels running from FDI to firm entry. This approach has been used in other contexts. For example, Wacziarg (2001) specifies a simultaneous equations model to investigate the impact of trade policy on economic growth transmitted through six channels, while Tavares and Wacziarg (2001) evaluate the relationship between democracy and growth via the same approach. We propose this methodology because of its suitability for the analysis of interdependent relationships inherent in the FDI-entry link. In this way, it is hoped that more informative and reliable conclusions can be drawn. Furthermore, our setup treats the level of industry concentration and wages as endogenous variables, which are often taken as given in previous studies. The concurrent pursuit of these two channels allows us to gauge their relative importance in explaining new firm formation and complements the theoretical treatments by Markusen and Venables (1999) and Grossman (1984).

The structure of this paper is as follows. Section 2 discusses the theoretical under-pinnings of how FDI is related to domestic firm entry through industry competition and wage levels. Arguments on the direct FDI-entry link are also considered. We also develop our hypotheses in this section. Next, Section 3 presents the data and the estimation method. Section 4 discusses the empirical results. Finally, Section 5 concludes with a discussion of our main results, the limitations of our research, and its implications for theory and practice as well as avenues for future research.

2 Theoretical background and hypotheses

As discussed in the previous section, FDI may be simultaneously linked to new firm creation directly and/or via the wage and competition channels. This section explores relevant studies on the relationship between FDI on the one hand, and firm entry, industry competition and wages on the other. Moreover, we develop three main hypotheses regarding these associations in the following subsections.

2.1 Competition effects of FDI and new firm entry

2.1.1 FDI and industry competition

From a theoretical point of view, the literature proposes two competing arguments regarding the impact of FDI on market structure in host countries. The first

one posits that FDI reduces the level of industry concentration and increases competition. The intuition is that foreign entry takes place in response to market failures so that industries where market imperfections are prevalent attract higher volumes of FDI (Caves 2007). Dunning and Lundan (2008) classify market imperfections into two categories: those peculiar to the industry in question such as scale economies, and those that are caused by the distorting behavior of regulators and firms, such as government-imposed rigidities and predatory pricing. Being exposed to multiple market environments, foreign firms have a distinct advantage in overcoming these entry barriers and other imperfections which curb the number of firms in some industries (Geroski 1991a). Their advantages derive, among others, from superior production technology, knowledge of new products, organizational, and marketing capabilities (Teece 1985). From this perspective, foreign firms are the most likely entrants in industries where domestic firms have a limited capacity to enter (Gorecki 1976). Hence, FDI is expected to decrease industry concentration (Caves 2007). Likewise, as outlined by Driffield (2001a), domestic industries face competitive pressures from the influx of FDI and subsequently the market shares of the leading host country firms are reduced. Blomström and Kokko (1999) and Teece (2006) argue that foreign firms increase competition, as their entry and operational strategies disrupt established relationships between incumbent domestic firms and force incumbents to become more efficient.

The second argument runs counter to these views and poses that FDI raises the level of industry concentration and reduces competition. According to Hymer (1976) and Kindleberger (1969), firms expand abroad to remove competition through exploiting Bain-type monopolistic advantages. These advantages are exclusive to the firm owning them and pertain to the realms of innovatory, cost, financial, or marketing capabilities (Dunning and Lundan 2008). Put differently, FDI is used as an effective instrument to restrain competition and to augment market power via the unique combination of skills and assets transferred abroad. Likewise, Casson (1986) argues that foreign investors are increasingly lured by host countries because of the possibilities for above-normal profits in concentrated industries. Indeed, explanations of FDI based on ownership advantages place an emphasis on the idea that firms undertake investment abroad in order to earn above-normal profits through the exploitation of their competitive advantages. Foreign firms tend to be better placed than their weak domestic counterparts to extract rents. Faced with superior efficiency and aggressive business conduct, domestic firms may not withstand disruptive shocks and be forced out of business, resulting in an increase in industry concentration (Aitken and Harrison 1999). Forte (2016) argues that anti-competitive effects are foreseeable because foreign firms, which are larger in size, create their own barriers for further competition by increasing the industry's minimum efficient scale.

Both of these conflicting views are plausible but we anticipate that the pro-competitive effect prevails in our analysis of the Dutch case. Domestic firms in developed economies may already possess the technology that foreign firms bring, and are therefore able to compete more vigorously with them (OECD 2002), dissipating any excess profits. The Netherlands attracts FDI predominantly from advanced economies so that technological proximity between Dutch and foreign firms is expected to be high. As Amess and Roberts (2005) and Lall (1979) argue, when differences in technological and organizational capabilities are small, FDI is likely to be pro-competitive and to reduce industry concentration. Driffield (2001a, b) report results in line with this prediction and conclude that the presence of FDI in the manufacturing industries in the UK reduces the concentration ratio. Furthermore, in the Netherlands firmly enforced and credible antitrust laws are in place to prohibit anti-competitive behavior of foreign firms.

This study does not consider the entry mode of FDI since our firm-level data does not permit us to differentiate between greenfield and mergers and acquisitions (M&A). Yet, the aggregate figures indicate that the majority of FDI in the Netherlands takes the form of M&A (Hogenbirk et al. 2009). At the outset, M&A involves the transfer of ownership rights rather than new local production capacity. Accordingly, one could argue that FDI in this context is more likely to increase industry concentration as opposed to what is suggested. We are of the opinion that such reasoning is especially pertinent to M&A taking place between domestic firms. In contrast, cross-border M&A can contribute to a more pro-competitive environment by acting as the vanguard of new foreign entrants in the domestic economy. Furthermore, M&A prevents concentration levels from rising by preserving local firms

which otherwise would cease operating. As UNCTAD (2000) puts forward, in the long run, the independent effects of greenfield and M&A on host countries in various domains, including industry concentration, are indistinguishable. For example, following cross-border M&A, foreign acquires often expand domestic operations through subsequent investments. FDI via the M&A route tends to contribute to the production capacity just as greenfield FDI does, but this impact materializes over a longer time horizon. Given the 15-year coverage of our data, we have sufficient confidence that our analysis captures this conceptualization, and provides justification for the pro-competitive effects of FDI. In line with this reasoning, we formulate the following sub-hypothesis:

H1a The greater the FDI in an industry, the lower (higher) the industry concentration (competition).

2.1.2 Industry competition and new firm entry

Since Orr (1974)'s prominent article on the determinants of new firm entry, there have been many studies evaluating how industry concentration affects entry. The most prominent view is that high concentration acts as a deterrent (Siegfried and Evans 1994). In industries characterized by high concentration, new entrants may pose an immediate threat to the customer base of established firms and are expected to erode their market share. Hence, powerful incumbents often have incentives to drive them out of business before new comers establish themselves and secure their survival (Shane 2003). Put differently, high concentration facilitates collusion and predatory behavior among firms to discourage entry. The tendency of incumbents to respond aggressively is most pronounced when their profits are strategically interdependent (Oster 1999). Alternative conducts include, among others, predatory pricing, hostile takeovers, heavy advertising outlays, and preemptive capacity expansion. Monitoring strategic characteristics of established firms, would-be entrepreneurs infer such predatory intents and take them into account in their entry decisions. Nevertheless, in cases where domestic and foreign firms share similarities in technological and organizational capabilities, the former may take a stronger stance against undesirable practices. The innovative capacity of new entrants enables them to overcome various challenges imposed and characterized by FDI. Driven by excess profits opportunities, they can enter and expand more easily in concentrated industries along with foreign firms. These arguments suggest the following sub-hypothesis:

H1b The greater the reduction in industry concentration due to FDI, the greater the entry rate in the same industry.

2.2 Wage effects of FDI and new firm entry

2.2.1 FDI and industry wages

A vast literature is devoted to the consequences of foreign presence on local labor market conditions (Görg and Greenaway 2004). Of particular interest to this study are the effects of FDI on wage levels.

First, increased wages in host countries can be attributed to productivity growth induced by foreign firms. For instance, access to foreign knowledge may foster human capital formation and bring productivity gains to domestic firms. Learning from foreign firms is viewed as a central vehicle of technology transfer. Provided that technology introduced by foreign firms is internalized by the domestic labor force and knowledge spreads to local enterprises, domestic employees may become more productive over time (Aitken et al. 1996). This allows local companies to reduce inefficiencies, leading to productivity growth and higher productivity raises wage rates in the domestic economy (Driffield and Taylor 2000).

Second, foreign firms might also create upward pressure on wages simply by raising demand for labor (Das 2002). Hence, FDI-induced competition in labor markets can force domestic firms to increase wages with the aim of attracting a better qualified workforce. However, concerns have been expressed that foreign firms and their domestic counterparts may simply operate in different labor markets. That is, factor demand of firms may substantially differ. For example, foreign firms may prefer to hire a highly skilled workforce, because technology accompanying FDI is expected to be complementary to skilled labor (Görg and Greenaway 2004). An increase in foreign capital would then increase demand and wages for highly skilled labor.

The drawbacks of such segmentation in labor markets include less scope for positive effects on wages as the mobility of skilled labor towards domestic

firms would be limited. Furthermore, by poaching the more productive workers, foreign firms may lower both the quality of labor and wage rates in domestic firms (Driffield and Girma 2003). Besides positive wage spillovers, higher wages in host countries may also reflect the fact that foreign firms generally pay higher wages than their domestic counterparts both in developed and developing countries (Almeida 2007; Görg and Greenaway 2004; Heyman et al. 2007). This observation is attributed to their larger size together with being more capital and skill intensive. In fact, productivity advantages stemming from these properties tend to be a source of wage differentials. For example, Conyon et al. (2002) find a wage differential of 3.4% across foreign and domestically owned firms in the UK manufacturing industries caused solely by productivity. There are other plausible reasons why foreign firms pay a higher price for labor.

Offering wage premiums might be necessary to attract qualified workers when knowledge of local market conditions is inadequate. Incentives to reduce labor turnover can also motivate foreign firms to offer higher wages. This would be important for foreign firms if they want to minimize the risk of leakage of proprietary knowledge, or of employee skills augmented through training (Fosfuri et al. 2001). Moreover, the local labor force may have a preference for employment in domestic enterprises if jobs elsewhere are viewed as less secure. Wage premiums may act as a response to this home bias in choosing a preferred employer. Finally, internal fairness policies within foreign firms may aim at reducing wage gaps between employees across different locations, thus motivating higher wages.[2]

H2a The greater the FDI in an industry, the higher the industry wage level.

2.2.2 Industry wages and new firm entry

From the above discussion, it is evident that wages in host countries can in part be explained by the existence of foreign firms. The combination of higher wages in foreign firms and positive wage spillovers to domestic firms leads to higher overall wages. This will have implications for domestic entrepreneurship.

[2]See Lipsey (2004) for a summary of the literature on FDI and wages.

Potential entrepreneurs represent an untapped resource for the development of national economies. When a market opportunity is recognized, entrepreneurs face an occupational choice. They tend to compare waged employment at an established firm to the potential profits from venture creation (Roy 1951; Parker 2009). Entrepreneurial ideas are exploited, provided that accompanying benefits outnumber alternatives. By increasing overall wage rates and offering wage premiums in host countries, foreign firms may influence the trade-off between waged employment and entrepreneurship in favor of the former. Prospective entrepreneurs would be hired by foreign-owned firms that offer higher wages and promising career opportunities. Entrepreneurs with expertise in various domains may be especially complementary to the advanced technologies introduced by foreign firms. Thus, recruiting entrepreneurially talented individuals can bring numerous advantages to foreign firms, which are compensated with an attractive wage. As this gives rise to a smaller pool of future entrepreneurs (De Backer and Sleuwaegen 2003; Grossman 1984; Lee et al. 2014), FDI may restrict new firm creation in host countries. In line with this reasoning, we hypothesize that:

H2b The greater the increase in industry wages due to FDI, the lower the entry rate in the same industry.

2.3 Direct effects of FDI on new firm entry

Undoubtedly, there are other mechanisms through which FDI may affect domestic firm entry. Our empirical setting, however, does not allow us to separate and quantify the independent effect of specific factors. Therefore, in what follows, we review briefly the main insights that are relevant to our context and formulate the hypothesis accounting for the totality of the relations other than those identified above. This is termed as "the direct effect" of FDI to distinguish it from the effects of industry concentration and wage channels on entry.

Theory suggests that the remaining FDI effects can be both positive and negative and we start with the former. First, domestic entrepreneurs can improve their chances of establishing successful businesses by observing and imitating products, technologies, and organizational practices of foreign firms. This mechanism is known as the demonstration effect (Görg

and Strobl 2001; Barry et al. 2003). As new products are already accepted in the marketplace, entrepreneurs may discern their commercial viability and convert them into profitable businesses with low failure risk. The extent of benefits depends on the sophistication of technology, with complex products and processes requiring specialized labor and skills are hard to imitate through observation. In contrast, organizational innovations are easier to replicate by would-be entrepreneurs (Görg and Greenaway 2004). Second, FDI may enrich the local knowledge base through the physical migration of workers. Foreign firms dedicate substantial resources to training and education to improve the capacity of their workforce, encouraging creativity and innovation. Equipped with a unique set of skills, people previously employed in foreign firms may start their own businesses. Furthermore, they may view priorities and strategies of foreign firms as the benchmark from which to learn and emulate in their founding and early growth stages (Barbosa and Eiriz 2009).

Third, export-oriented FDI may assist host country firms in reaching markets beyond their national borders (Aitken et al. 1997). For example, domestic firms may be created when overseas market opportunities are detected through the exploitation of foreign firms' distribution channels and knowledge of consumer preferences. Entrepreneurs can arrange such exclusive transactions through informal social networks and joint memberships in business associations (Greenaway et al. 2004).

Increased foreign presence may also exert a downward influence on entry. To begin with, entrepreneurship requires a variety of resources including capital, appropriate infrastructure, technological know-how, and alike. These are utilized both during the establishment and subsequent expansion period. FDI into a country alters the balance of resources and often shifts them away from would-be entrepreneurs. As such, foreign firms may bid up factor prices raising the cost of new firm entry and affecting the subsequent earnings potential. The shortage of affordable resources changes the motives of domestic entrepreneurs in relation to owning a business (Parker 2009). Fewer individuals may opt for entrepreneurship where the initial cost requirements are higher and the required resources are of great variety. Second, foreign firms are often eligible for various incentives, such as export incentive programs and tax allowances which can result in high entry barriers in certain industries, constraining new firm formation (Aitken and Harrison 1999; Haddad and Harrison 1993). Furthermore, industries are heterogeneous in many of their characteristics, including innovation patterns and technological levels. In turn, these discrepancies are likely to affect the way entrepreneurship rates react to FDI presence in the respective industries. While high-tech sectors may be at an advantage due to the greater innovative capacity, low-tech sectors are more prone to the negative effects imposed by FDI (Görg and Strobl 2000).

In the Netherlands, the workforce is characterized by high productivity and educational attainment with a strong international orientation (Hogenbirk et al. 2009). Such a capacity is not only complementary to the advanced technologies embodied in FDI, but also enables individuals to exploit new knowledge and turn it into entrepreneurial ideas. Drawing on these arguments, we propose the following hypothesis:

H3 The greater the FDI in an industry, the greater the positive direct effect on firm entry.

3 Data and methodology

3.1 Data sources

Firm-level data used in this study is made available by CBS (Centraal Bureau voor de Statistiek/ Statistics Netherlands) via several data bases. Each firm in our sample had a unique identification number which enabled us to link all data sources discussed below into a single file. All surveys are collected annually. In order to build the data set, we started with the Business Register (ABR), which incorporates the whole population of firms and reports annual statistics, including the number of employees as well as industry code a firm belonged to and its location. From this database, we also extracted information whether a firm is newly formed or already existing. We focus on manufacturing as it has the most detailed data available and also the longest time period.

We merged the Business Register with Production Statistics (PS-Industry), which consist of information about wages, turnover, research and development expenses, advertising as well as training costs of firms. For the FDI variable, we used the Financial Statistics

of Large Enterprises (SFGO),[3] which provide data on the percentage of a firm's equity owned by foreign investors. SFGO incorporates firms with a total asset of at least 22.7M€. We use SFGO to identify the presence of FDI per firm and industry. From SFGO, together with its equivalent for small firms SFKO[4] and NFO[5], we also obtained more information on wages, capital stocks and number of employees as well. Our FDI measure is therefore limited to investments into firms with assets of at least 22.7M€, which account for the large majority of foreign investment.

Data on age structure and gender composition of workforce come from the Municipal Personal Records Database (GBA).[6] Finally, the skill level of the labor force is made available via the source Educational Level (HOOGSTEOPLTAB), which utilizes the International Standard Classification of Education (ISCED) maintained by the United Nations. In order to link person information to the respective firm, we had to use two other surveys: BAANKENMERENBUS and BAANSOMMENTAB. Observations at the firm level are then aggregated at the industry level based on the NACE rev. 1.1 classification at the five-digit (SBI five-digit level)[7] of manufacturing industries.

The final sample is an unbalanced panel covering the years between 1995 and 2010 and comprising 3784[8] industry-year observations that span 252 industries, over a 15-year period. Appendix B describes definitions and sources of our variables in more detail.

3.2 Variables

We define Entry_{it} as the gross entry rate of indigenous firms, which is calculated as the number of domestic firm entries at time t divided by the total number of firms in the same period in industry i.

$$\text{Entry}_{it} = \frac{\sum_{j\in i} \text{Entry}_{jt}}{\sum_{j\in i} j_t}$$

While some studies such as Markusen and Venables (1999) use changes in the total number of firms (net entry), most studies of entry employ gross entry rate (e.g., Acs and Audretsch 1989 and Mata 1993) because the latter is not confounded by determinants that only affect firm exit. $\ln(\text{Wage}_{it})$ is defined as the natural logarithm of the average wage per employee. The average wage is calculated as the total wage expenditure in industry i divided by the total number of employees in the same industry at time t.

$$\ln(\text{Wage}_{it}) = \ln\left(\frac{\sum_{j\in i} \text{WAGE}_{jt}}{\sum_{j\in i} \text{Labor}_{jt}}\right)$$

The Herfindahl Index (HHI) is a proxy for concentration and computed as the sum of the squares of the market shares of all firms in industry i at time t. We use turnover (sales) to quantify market shares and hence HHI_{it}:

$$\text{HHI}_{it} = \sum_{j\in i}\left\{\frac{(\text{Turnover}_{jt})}{\sum_{j\in i}(\text{Turnover}_{jt})}\right\}^2$$

To avoid possible aggregation bias, we compute FDI_{it} as employment in foreign-owned firms weighted by firms' foreign equity participation divided by total employment in industry i at time t.

$$\text{FDI}_{it} = \left(\sum_{j\in i} \text{FDI}_{jt}\left(\frac{\text{Labor}_{jt}}{\sum_{j\in i}\text{Labor}_{jt}}\right)\right)/100$$

We define the minimum efficient scale as the average firm size in terms of employment in industry i at time t which serves as a proxy for barriers to entry in the sector. A high MES_{it} may deter new firm formation due to, for example, higher capital requirements. (see Görg and Strobl 2002, Geroski 1991b)

$$\text{MES}_{it} = \frac{\sum_i \text{Labor}_i}{\sum_i j_i}$$

Growth_{it} refers to the industry annual employment growth rate. A growing market offers a higher probability of survival for start-up firms; hence, more firms may enter the market (Mata and Machado 1996).

$$\text{Growth}_{it} = \text{Labor}_{it} - \text{Labor}_{it-1}$$

Note that we use the number of employees to weight FDI and to define MES and Growth since labor

[3] Statistiek financiën van grote (niet-financiële) ondernemingen in Dutch.

[4] Statistiek financiën kleine ondernemingen in Dutch.

[5] As of 2000, SFGO and SFKO merged into a single data set; the so-called statistics on finances of non-financial enterprises (NFO-statistiek financiën van niet-financiële ondernemingen in Dutch). However, SFGO as such is still available.

[6] Gemeentelijke basisadministratie persoonsgegevens in Dutch.

[7] SBI stands for "standaard bedrijfsindeling" which corresponds to the Dutch version of the NACE industry classification.

[8] This value is based on model 1 in Table 3 where no lag structure is imposed. Alternative models with different lag lengths and the breakdown of industries based on technological intensity culminate in different number of observations.

is the only proxy for firm size with complete information in our data. Furthermore, we define Capital_{it} as the capital labor ratio: industry capital stock divided by total employment in industry i at time t.

$$\text{Capital}_{it} = \frac{\sum_{j \in i} \text{Capital}_{jt}}{\text{Labor}_{it}}$$

Similarly, the variable Training_{it} is training cost per employee per industry. $\ln(\text{R\&D}_{it})$ and $\ln(\text{Advertisement}_{it})$ are respectively the natural logarithms of research and development expenditures and advertising expenditures per industry. Female_{it} is the proportion of female workers and Skill_{it} is the share of employees who have a college degree in industry i. This variable serves as a proxy for highly skilled workers. Age_{it} is the average age of the workforce in industry i. To control for spatial heterogeneity, we introduce the variable Region_{it}, which is defined as the proportion of firms in industry i located in one of the following provinces: North Holland, South Holland, or North Brabant. We either take the natural logarithm of the variables or winsorize them.

3.3 Methodology

To analyze whether FDI presence in Dutch manufacturing industries is directly or indirectly related to domestic new firm creation via the wage and/or competition channels, we formulate a system of three equations. We estimate these simultaneous equations using three-stage least squares (3SLS). This system considers, on the one hand, the effect of FDI on new firm entry, wages, and market concentration, while, on the other hand, it takes into account that wages and concentration may also have an indirect effect on new firm creation: In particular, for each industry i and year t, let Entry_{it} denote the rate of domestic gross entry, Wage_{it} average industry wages and HHI_{it} industry concentration. Hence, the system of equations is as follows:

$$\text{Entry}_{it} = \alpha_1 \text{Wage}_{it} + \gamma_1 \text{HHI}_{it} + \theta_1 \text{FDI}_{it} + \beta_1 X_1 + \tau_t + \iota_i + \varepsilon_1 \quad (1)$$

$$\text{Wage}_{it} = \theta_2 \text{FDI}_{it} + \beta_2 X_2 + \tau_t + \iota_i + \varepsilon_2 \quad (2)$$

$$\text{HHI}_{it} = \theta_3 \text{FDI}_{it} + \beta_3 X_3 + \tau_t + \iota_i + \varepsilon_3 \quad (3)$$

where FDI_{it} is the share of industry employment in foreign firms, and where X_1, X_2, X_3 represent matrices with industry-year specific control variables. X_1 and X_3 are the matrices of explanatory variables Growth_{it}, MES_{it}, Capital_{it}, $\text{R\&D}_{it}$, $\text{Advertisement}_{it}$, Region_{it}, and X_2 is the matrix of explanatory variables MES_{it}, Capital_{it}, Age_{it}, Female_{it}, Training_{it}, Skill_{it}, and Region_{it}. Finally, ι_i are added to each model to account for unobserved industry-specific time-invariant effects. Likewise, τ_t are incorporated to capture unobserved time-varying effects. ε_1 , ε_2, and ε_3 are disturbance terms.

The inclusion of the above control variables in each of the three specifications is in line with earlier studies on firm entry, market concentration, and wage rates (i.e., Görg and Strobl 2002; Mata 1993; Görg and Greenaway 2004). We start with X_1 in Eq. 1. Entry into industries with higher growth potential is often found to be easier. Therefore, we expect a positive association between gross entry rates and the variable Growth (Görg and Strobl 2002; Mata and Machado 1996). On the other hand, MES, Capital, and Advertisement may serve as entry barriers for new firms with higher values indicating higher barriers to entry. Given this reasoning, a negative relationship between these measures and gross entry is plausible.

Potential effects of R&D on entry are unclear. On the one hand, the rates of new firm entry can be larger when there is a relatively high level of technological opportunity or R&D intensity. On the other hand, high R&D expenditures may act as an entry deterrent. The use of these variables is prevalent in the literature and has proven important in explaining firm entry rate (e.g., Acs and Audretsch 1989; Barrios et al. 2005; Geroski 1995; Mata 1993).

With regard to the wage specification and control variables of X_2 in Eq. 2, the literature suggests that capital intensive industries have a higher marginal product of labor, and thus pay higher wage rates (Görg and Greenaway 2004). Likewise, in industries where the average skill level is higher, the workforce is paid higher wages due to the skill premium (Lipsey

and Sjöholm 2004). Given this evidence, it is plausible to anticipate a positive link between wages and the variables Capital and Skill. Furthermore, previous studies point to significant female-male wage differentials where women are often paid less than men (Aitken et al. 1996). Finally, we expect Age and Training to influence average industry wages positively as the labor force acquires additional skills through experience and on-the-job training (Zhao 2001).

With respect to the determinants of industry concentration and control variables of X_3 in Eq. 3, we expect Growth to have a negative association with HHI as, with all being equal, growing industries accommodate more new firms. MES, Capital, and Advertisement are control variables reflecting entry barriers. As higher barriers impede new firm creation, we expect a positive relationship between industry concentration and these measures. Furthermore, if larger R&D expands the range of opportunities for new entry, such practices would diminish market concentration. In contrast, if it acts as an entry barrier, concentration rates tend to rise with increases in R&D. The importance of these variables in determining industry concentration is widely discussed in the literature (Blomström 1986; Driffield 2001a; Forte 2016), which is why we include them in our empirical specification.

To determine whether the total effect of FDI on entry rates (direct effect plus effects via channels) is positive or negative, we take the partial derivative of the system of equations presented above with respect to FDI:

$$\begin{aligned}\frac{\partial Y_1}{\partial \text{FDI}} &= \theta_1 + \alpha_1 \frac{\partial Y_2}{\partial \text{FDI}} + \gamma_1 \frac{\partial Y_3}{\partial \text{FDI}} \\ &= \theta_1 + \alpha_1 \theta_2 + \gamma_1 \theta_3\end{aligned}$$

Furthermore, we estimate the system of Eqs. 1–3 by adding lagged FDI (FDI_{t-1} and FDI_{t-2}) into the regression. This allows varying amounts of recent history to be brought into the estimation model in order to capture possible effect of FDI on entry during period t using knowledge of what happened during $t-1$ and $t-2$.

Our analysis applies the method of Tavares and Wacziarg (2001) and Wacziarg (2001) to the entrepreneurship literature in connection with FDI, and we estimate entry, wage, and concentration equations simultaneously by using 3SLS. This technique allows entry rates, wage, and concentration levels to be determined concurrently within the system. Introduced by Zellner and Theil (1962), 3SLS is a full-information approach because it makes use of knowledge of all the restrictions in the system of structural equations when estimating the parameters. Put differently, it allows for contemporaneous correlation in the disturbances across equations. We applied the Breusch-Pagan test of independence to assess whether the cross-equation error covariance exists in the data (Greene 2011), and confirmed the need for the simultaneous estimation approach.[9] By deriving a single covariance matrix for the error terms through joint estimation, 3SLS lead to efficiency gains compared to the estimation of each equation independently. Moreover, the Hausman specification test verified that the system of structural equations is properly specified.

The joint estimation of entry, concentration, and wage specifications points to endogeneity concerns as ln(WAGE) and HHI appear on the right-hand side of Eq. 1. 3SLS yields consistency but this necessitates appropriate instrumenting for each endogenous variable in our system. The first stage of 3SLS deals with this challenge where endogenous measures are regressed on all exogenous variables to obtain their fitted values used as valid instruments. The second stage involves estimating each specification in the system separately via 2SLS utilizing the instruments derived in the first stage. This enables the construction of the covariance matrix for the disturbances of the system of structural equations. Finally, in the third stage, both the estimated covariance matrix from the second stage and the predicted values of the endogenous variables retrieved in the first stage are used to perform the generalized least squares estimation.

3.4 Descriptive Statistics

Table 1 provides some descriptive statistics. We see that the gross entry rate in Dutch manufacturing industries is about 7.4% on average over the sample period. Furthermore, foreign firms account for 16% of industry employment on average with the lowest and highest values observed at 0 to 100%. This suggests that while certain industries fail to attract FDI inflows, some other sectors are entirely dominated by foreign firms. Moreover, Dutch manufacturing industries, on average, have 4973 employees with an average age of

[9] All unreported results are available from the authors on request.

Table 1 Summary statistics

Variable	Description	Mean	Std.	Min	Max
$Entry_{it}$	Domestic gross entry rate in industry i at time t	0.074	0.068	0	0.75
FDI_{it}	Foreign firm presence	0.16	0.229	0	1
HHI_{it}	Herfindahl index (concentration ratio)	0.318	0.266	0.005	1
$Wage_{it}$	Average wage per employee	38.925	353.038	0	17380.57
$Labor_{it}$	Total number of employees per industry	4973.22	9139.92	2	119861.5
$Growth_{it}$	Annual industry growth rate	0.015	0.372	−0.8	2.504
MES_{it}	Average firm size per industry	52.367	80.07	0.884	525.667
$Capital_{it}$	Capital labor ratio	52092.94	388972.8	0	12400000
$R\&D_{it}$	Research and development intensity	7865.095	74124.96	0	1860314
$Advertisement_{it}$	Advertising intensity	8737.489	24222.53	0	347292
Age_{it}	Average age of the workforce	38.925	353.038	20	54.344
$Female_{it}$	Proportion of female employees	0.247	0.149	0	0.806
$Training_{it}$	Training cost per employee	0.223	0.269	0	4.406
$Skill_{it}$	Skill composition of the workforce	0.295	0.136	0	1
$Region_{it}$	Proportion of firms in certain regions	0.465	0.137	0	1

Wage, Capital, R&D, Advertisement, and Training are 1000€ per unit

39, of which approximately 25% are female and 30% are highly skilled over the sample period. Employees, on average, receive 38,000€ per year.

While in the USA, an industry is considered as moderately concentrated if its HHI index falls between 0.15 and 0.25, a value in excess of 0.25 points out high market concentration.[10] In contrast, the EU prefers to focus on the change rather than the absolute level of the HHI index to conclude whether an industry is concentrated or not. With an average HHI value of 0.32, Dutch manufacturing industries proved to be highly concentrated according to the US standard. However, the same concentration ratio does not convey much information within the realms of the EU competition legislation as the average HHI in Table 1 refers to the level rather than the change in the concentration index.

An examination of the Pearson correlation matrix in Table 2 suggests that pairwise correlations between independent variables used in Eqs. 1–3 are generally below. 3 suggesting there is no multicollinearity problem. The two exceptions are the association between Training and FDI, and that between Advertisement and R&D. The corresponding correlations are still below .5. Therefore, there are no major concerns with regard to multicollinearity among the explanatory variables. Table 2 also shows a negative correlation between FDI and Entry, and also between Wage and Entry while Wage has a positive correlation with FDI. Furthermore, the matrix implies a positive correlation between HHI and Entry as well as HHI and FDI.

4 Empirical results

Table 3 presents the estimation results. There are three panels corresponding to the three Eqs. 1–3. While panel A displays the results for the entry (1), panel B shows the results for the wage (2). The results from the concentration (3) are reported in panel C. In the first model, the contemporaneous level of FDI is included, while in models (2) and (3) FDI is lagged one and two years, respectively.

To asses support for H1a and H2a, we begin with panels C and B. As shown in panel C model (1), the coefficient on foreign investment is significantly positive indicating that higher FDI is associated with higher degrees of market concentration, and thus with lower competition. To be more precise, a 10% increase

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- Details on this issue for the US are available at URL: goo.gl/SfuHTH (retrieved on 09/10/2013).
- More information on the competition legislation within the EU is available at URL: goo.gl/dGTaqW (retrieved on 09/10/2013).

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Table 2 Pearson pairwise correlation coefficients

	Entry	FDI	HHI	ln(W)	ln(Growth)	MES	ln(Capit.)	ln(R&D)	ln(ADV)	Age	Female	Skill	Train.	Region
Entry	1													
FDI	− 0.059	1												
HHI	0.058	0.053	1											
ln(Wage)	− 0.216	0.262	− 0.061	1										
ln(Growth)	0.083	− 0.011	0.044	− 0.081	1									
MES	0.058	0.244	0.116	0.028	0.160	1								
ln(Capital)	− 0.059	0.129	− 0.221	0.236	− 0.030	− 0.011	1							
ln(R&D)	− 0.007	0.242	− 0.283	0.252	0.017	0.205	0.274	1						
ln(ADV)	0.102	0.018	− 0.248	− 0.079	− 0.048	0.105	0.297	(0.364)	1					
Age	− 0.234	0.125	0.134	0.176	− 0.019	0.129	− 0.166	−0.161	− 0.197	1				
Female	− 0.021	− 0.137	0.033	− 0.169	− 0.065	− 0.174	− 0.099	− 0.115	0.020	0.034	1			
Skill	0.243	0.141	0.142	0.061	0.044	0.255	0.044	0.224	0.336	− 0.012	− 0.029	1		
Training	− 0.068	(0.372)	0.103	0.266	− 0.001	0.255	0.112	0.208	0.021	0.110	− 0.105	0.262	1	
Region	0.096	− 0.043	− 0.048	− 0.118	− 0.026	0.027	− 0.010	0.038	0.091	− 0.021	0.176	0.086	− 0.002	1

Note: N=3784. Correlations are based on Model 1 in Table 3. The values greater than an absolute cut-off of 0.3 are shown in parenthesis

Table 3 3SLS results

Entry	Model 1	Model 2	Model 3
Panel A			
FDI_{it}	− .040*** (.011)		
FDI_{it-1}		− .032*** (.011)	
FDI_{it-2}			− .031*** (.011)
ln(Wage)	− .036*** (.009)	− .038***(.009)	− .043*** (.009)
HHI	.443*** (.075)	.449***(.075)	.548***(.077)
ln(Growth)	.022*** (.004)	.020***(.004)	.024*** (.005)
MES	− .007***(.002)	− .007*** (.002)	− .008***(.003)
ln(Capital)	.008*** (.002)	.008*** (.002)	.011*** (.002)
ln(R&D)	.002* (.001)	.002* (.001)	.004*** (.001)
ln(Advertisement)	.015*** (.003)	.015*** (.003)	.017*** (.003)
Region	.053***(.014)	.056*** (.014)	.039*** (.015)
Constant	− .086** (.040)	− .091**(.040)	− .066* (.037)
R^2	0.113	0.10	0.271
Panel B			
ln(Wage)			
FDI_{it}	.549***(.052)		
FDI_{it-1}		.423*** (.053)	
FDI_{it-2}			.434*** (.053)
MES	− .152*** (.015)	− .146*** (.014)	− .157*** (.015)
ln(Capital)	.019*** (.005)	.021*** (.005)	.020*** (.005)
Age	.029*** (.004)	.027*** (.004)	.028*** (.004)
Female	− .596*** (.116)	− .612*** (.117)	− .542*** (.117)
Skill	.215** (.089)	.212** (.090)	.216** (.091)
Training Cost	.902*** (.046)	.948*** (.046)	.898*** (.045)
Region	.011 (.080)	.002 (.081)	− .003 (.082)
Constant	1.336*** (.282)	1.508*** (.283)	1.263*** (.275)
R^2	.547	.540	.543
Panel C			
HHI			
FDI_{it}	.109*** (.020)		
FDI_{it-1}		.106*** (.021)	
FDI_{it-2}			.083*** (.022)
ln(Growth)	− .010(.010)	− .006(.010)	− .013 (.011)
MES	.005***(.006)	.005***(.006)	.005*** (.006)
ln(Capital)	− .021*** (.002)	− .021*** (.002)	− .022*** (.002)
ln(R&D)	− .005** (.003)	− .005** (.003)	− .005* (.003)
ln(Advertisement)	− .032*** (.003)	− .032*** (.003)	− .030***(.003)
Region	− .027 (.032)	− .031 (.032)	− .001 (.034)
Constant	.672*** (.066)	1.056*** (.084)	.615*** (.069)
R^2	.545	.111	.552
Obs.	3784	3782	3528
Total effect of FDI	− .012	− .001	− .004

Robust standard errors in parentheses, year, and industry effects are included

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

in FDI presence (measured as the share of foreign employment in a given industry) coincides with an increase of about 1.1% in the concentration level. This finding is contrary to our expectation regarding sub-hypothesis H1a. Nonetheless, using Greek manufacturing data, Bourlakis (1987) also reports a similar result. As demonstrated in panel B model (1), the estimated coefficient on FDI is positive and significant at the 1% level suggesting that a larger foreign presence in Dutch manufacturing coincides with higher average wages. A 10% increase in the foreign employment share corresponds to an increase of about 5.5% in the wage level in the same industry. This finding is consistent with sub-hypothesis H2a. Driffield and Girma (2003) report similar evidence in their study using UK electronic industries data.

The positive relationship between FDI on the one hand, and concentration and wage levels on the other hand, refutes H1a and confirms H2a. In model (1) of panel A, we show how these positive effects of FDI are translated into domestic entry rates. To begin with, the coefficient of HHI is positive and significant at the 1% level in panel A. Specifically, a one-standard deviation increase in industry concentration leads to an approximately 1.7% increase in gross entry rates. This suggests that in Dutch manufacturing sectors higher concentration tends to create higher profits that stimulate the entry of new and possibly more innovative or cost-efficient firms. Hence, H1b is partly supported. Our results are in line with the findings of Kleijweg and Lever (1996), who, in their study of firm entry and exit in Dutch manufacturing industries, also report a positive relationship between industry concentration and entry.

We now turn our attention to the effects of FDI-induced wage levels on gross entry (i.e., sub-hypothesis H2b). An examination of model (1) of panel A shows that the coefficient of ln(Wage) is negatively and significantly related to entry rates. As argued in Section 2.2, higher wage rates may encourage potential entrepreneurs to take up jobs in established firms rather than starting their own firm, and thereby crowd-out domestic entrepreneurship. All else equal, a 10% increase in the wage level in an industry is associated with a reduction of 3.6% in gross entry rates. This suggests that the availability of higher wages stemming from foreign presence is likely to pull individuals away from self-employment in Dutch manufacturing industries. Accordingly, our analysis offers support for H2b.

Until now, the focus has been on the indirect effects of FDI on entry through concentration and wages. As shown in panel A model (1), FDI has a significant negative direct effect on entry rates at the 1% confidence level. Contrary to our prediction in H3, FDI is found to discourage domestic entrepreneurship after its indirect effects are separated out. In the Dutch context, new firm entry tends to be more difficult when industries are exposed to significant levels of foreign investment. Note that a 10% increase in FDI reduces domestic entry by 0.4%, which is nearly 6% of the average entry rate. This is in line with the evidence provided by De Backer and Sleuwaegen (2003) in Belgium, and Goel (2018) in a cross-country framework. Table 7 in Appendix D reports the economic significance of both FDI and channel effects on entry corresponding models (1) to (3).

In all three equations (panels A, B, and C) in model (1) of Table 3, we implicitly assume that an increase in FDI[11] presence in one year would have an effect on the dependent variables in the same year. This simply assumes that all adjustments occur within one year. However, it may take a longer period of time for gross entry to respond to FDI presence. To assess this, we incorporate the first and second lags of this variable separately into each of the three equations (1) through (3). Estimation results from these alternative specifications are presented in models (2) and (3) in Table 3 respectively. Using these specifications, our results are qualitatively similar to those with contemporary FDI. This establishes the existence of relatively long-run effects of FDI on gross entry rates directly, and indirectly via wage and market concentration mechanisms.

Finally, we calculate the total effect of FDI on entry by using the approach described in Section 3.3. We take partial derivatives of Eqs. 1–3 and substitute the corresponding coefficients estimated from Table 3 in partial derivatives of the entry equation. As shown in the last row of Table 3, the total effect of FDI on gross entry rates is negative even after 2 years; however, this effect becomes much smaller and virtually vanishes after 1 year.

[11] Note that in this study, we only consider FDI of firms with total assets of at least 22.7M€ and entry rates are predominantly measured through small firms with total assets below 22.7M€. This means that we only investigate effects of FDI in larger firms on the entry of primarily small firms in order to solve the potential endogeneity of the former.

In models (1) to (3) in Table 3, the control variables perform in line with our expectations with few exceptions. The signs and significance levels of the coefficients on the control variables are overall consistent. This holds true for each of the three equations that are estimated simultaneously. Regarding entry equations in panel A, the coefficients on industry growth are significantly positive at the 1% level indicating that growing industries experience higher entry rates. Capital-labor ratio, advertising intensity and R&D are also positively linked to entry at varying significance levels. Furthermore, MES carries a significantly negative coefficient suggesting that a large average firm size in an industry deters new firm formation. With respect to wage equations in panel B, we see that female employees earn, on average, less than their male counterparts, a prediction that is well-supported empirically (Black and Brainerd 2004). The coefficients on Age, Skill, and Training suggest that older, more skilled, and better trained employees receive higher wages. All these results are in accordance with our expectations. Looking at the concentration equations in panel C, a number of control variables emerge as statistically significant. For instance, a higher minimum efficient scale (MES) coincides with increased industry concentration. In contrast, R&D intensity diminishes the level of concentration, possibly by expanding the range of opportunities for new entry through knowledge generation.

5 Conclusions and discussion

This study empirically examines the link between FDI and entry rates of new Dutch firms in manufacturing industries at the five-digit NACE level. As this association is multifaceted, we consider two channels transmitting FDI effects on entry: industry concentration (H1a, H1b) and wage levels (H2a, H2b). We also evaluate whether FDI is directly related to entry (H3) after these indirect effects are isolated.

First, we postulated that, in the Netherlands, increases in FDI correspond to reductions in the concentration level in the industry it targets (H1a), which subsequently has a positive association with domestic entry in the same industry (H1b). Our results lead to the rejection of H1a, suggesting that industry concentration rises with FDI. While this finding corroborates those reported by Bourlakis (1987) using Greek manufacturing data, it contrasts with the results of Driffield (2001a) drawing on UK manufacturing. Despite contradictory results, the research context of the latter is similar to our study in that we both focus on small open economies. The fact that Driffield (2001a) conducts the analysis with an older data set (1983–1992) and at a relatively aggregate level (three-digit) might play a role in the conflicting findings. Thus, what explains the positive link running from FDI to concentration? Blomström (1986) argues that one of the main motivations behind entering foreign markets is to earn above-normal profits, and thus foreign firms are predominantly attracted to concentrated industries offering this possibility. Upon entry, foreign firms intensify concentration by further increasing the minimum efficient scale which in turn inhibits new firm formation. While this interpretation justifies the finding of H1a, it fails to illuminate why high concentration is associated with higher entry rates. In a developed country, domestic firms, both incumbents and entrants, are not sharply distinct from their foreign counterparts regarding technological and organizational capabilities (Caves 2007). Our results suggest that, upon the recognition of above-normal profit opportunities in concentrated markets, new Dutch firms seem to easily circumvent entry barriers imposed by foreign firms, for example, due to technological compatibility. Hence, H1b is partly confirmed. Empirical support for this line of reasoning is reported by Kleijweg and Lever (1996) where high concentration is found to attract more new firms to Dutch manufacturing industries. Rosenbaum and Lamort (1992), and Jeong and Masson (1990) report similar results utilizing US and Korean data, respectively.

Our second hypothesis is that industries with larger FDI presence have higher wages (H2a) which eventually correspond to lower entrepreneurship rates in these sectors (H2b). The rationale here is that wage premiums paid by foreign firms in combination with positive wage spillovers to domestic firms culminate in higher average wages at the industry level. Corroborative evidence is provided by Aitken et al. (1996) in the USA, and by Driffield and Girma (2003) in the UK. The availability of higher wages, however, increases the opportunity cost of entry. Attracted by higher wages, entrepreneurially talented individuals may self-select into wage employment due to uncertainty over potential income from business creation as shown in Parker (2004). In their survey, van Praag and

Versloot (2007) report that entrepreneurs have lower median incomes that are more volatile and less secure than salaried jobs. Our analysis supports both H2a and H2b that FDI puts upward pressure on wage levels which is associated with lower gross entry rates in Dutch manufacturing industries.

Besides the two main hypotheses, our results suggest that the direct effect of FDI on entrepreneurship is negative and statistically significant. The effect prevails both in the short run and relatively long run, with its size diminishes over time. Thus, H3 does not hold. In order to explore what mechanisms are involved in this outcome, we take into account the heterogeneity of industries in terms of technological intensity. The rationale for this lies in the conviction that an industry's position on the technology ladder may play a role in determining the size and direction of FDI effects. Our extended analysis (see Appendix C) demonstrates that once the sample is split into high-tech and low-tech industries, the negatively significant effect on entrepreneurship is preserved only in the low-tech subsample. It vanishes in the high-tech subsample and even becomes positive (albeit insignificant). High-tech industries undertake extensive efforts to achieve technological progress and innovation in products and processes. The large capacity of these sectors in knowledge creation is (more) complementary to foreign firms' technological capabilities. Besides, the constant and quick renewal of technology generates a wealth of new business opportunities. These salient features may stimulate high-tech entrepreneurship and apparently counterbalance the adverse effects of FDI on domestic entry, which is more pronounced in low-tech industries. This could indicate that the limited capacity in low-tech industries prevents entrepreneurs from identifying, assimilating and converting new knowledge into up-and-coming businesses. Our finding for high- and low-tech industries is similar to the finding of Barbosa and Eiriz (2009), who did not trace any significant effect for the high-tech subsample.

Next to the industry breakdown, we have an alternative albeit tentative explanation for the direct negative effect of FDI. Foreign and domestic firms compete in local factor markets and the former may attract a sizable proportion of host country resources (e.g., finance, physical capital) through leveraging their global scale (Navaretti and Venables 2004). This shift in the supply-demand balance of key resources tends to raise the cost of new entry, putting domestic entrepreneurs at a disadvantage (Parker 2009). Large start-up costs may not only impede entry which otherwise would have taken place at increased rates, but also erode expected future returns. Extended periods of time are often required to cover large entry costs, which may block the development of enterprises and reduce the likelihood of their survival (van Stel et al. 2007). A large share of firms, however, fails in the early stages and few grow into large firms. A would-be entrepreneur with a business idea may not proceed with its commercialization if s/he perceives the success rate in generating revenues which offset initial expenditures is small. Accordingly, we envisage that through interactions in factor markets, foreign firms may dampen incentives of prospective entrepreneurs to establish new firms. Of course, this reasoning is suggestive and further empirical analysis is required to examine its validity.

We show that the totality of FDI effects on entry (channels plus direct) is negative. This is in line with the evidence reported by De Backer and Sleuwaegen (2003) using Belgian manufacturing data, and by Danakol et al. (2017) and Goel (2018) who carry out cross-country investigations. Nevertheless, our estimated effect is small and almost disappears after one year. Overall, our study shows that FDI can simultaneously be a threat and an opportunity for new business creation in Dutch manufacturing industries.

5.1 Implications for theory

The combination of our findings complements and extends research on the intersection of new firm entry, entrepreneurship, and host country effects of FDI. A review of representative work points to the diversity and complexity of factors underlying the influence of FDI on entry, yet empirical verification of these claims within an integrative framework is absent. As such, while there is agreement that industry concentration and wages are two fundamental channels through which FDI may affect new firm entry, the examination of how they vary in their effects merits a deeper analysis to ascertain their relative importance. Our results enrich the literature by quantifying and comparing these channels' effects on entry which work in opposite directions. This is of theoretical interest as well, as the trade-off of between concentration and wages implies the need for their joint consideration in future FDI studies. We also challenge the premise

that high concentration acts as entry deterrent. This result is salient in light of the overwhelming contrary evidence; and the analysis of whether high-profits, as we conjecture, or an alternative rationale explains this finding offers opportunities for theory building in the firm entry and entrepreneurship literature. Furthermore, the fact that a negative effect on entry persists after the indirect effects are removed clearly indicates the presence of other coexisting factors. We envision some factors hinder entry, some help, and some make no difference. For example, by drawing on the entrepreneurial ecosystem perspective, Bhawe and Zahra (2017) highlight the role of absorptive capacity in the way local entrepreneurship responds to rising FDI. Our study contributes to the theory by suggesting that the neglect of essential factors can result in biased assessments of the effects of FDI on firm entry. In order to attain a coherent and integrated representation of actual relationships, one needs to address this concern.

5.2 Policy implications

Our analysis also has policy implications. First, although high market concentration is a legitimate concern due to the potential abuse of market power against new entrants, such a conclusion is not justified in Dutch manufacturing sectors. Lucrative rents in markets seem to be accessible to both foreign and domestic firms, conceivably due to effective enforcement of policy arrangements on collusive and retaliatory conducts of incumbent firms, as well as technological proximity. Although there is no immediate threat of increased concentration, policy-makers can perform in-depth industry analyses to identify specific causes of this market distortion. For instance, heightened concentration in the industry may be the result of large-scale foreign entry. Alternatively, heavy R&D investment by foreign firms may give rise to the accumulation of market shares among a small number of enterprises. Besides, market conditions in certain industries may change more rapidly or slowly depending, for example, on the rate of the obsolescence of technology. A rapid renewal of technology, in turn, results in short product cycles where foreign firms can be more adept at reversing the market concentration in their favor. As a result, due to the various causes of market concentration surrounding FDI, any policy response correcting anti-competitive behavior should place greater emphasis on specific industry settings, and should be formulated accordingly.

Second, policy-makers may develop strategies to curb the negative effects of FDI on entrepreneurship conveyed through the wage channel. Yet, from a welfare point of view, an effective policy design should not necessarily equate the selection of entrepreneurial talent into wage employment to being undesirable. Under certain circumstances, the added welfare of employment filled with innovative and creative practices may be comparable to, or even larger than that arising from new firm activity, given the persistent high failure rates of start-ups. For instance, if a motivated entrepreneur takes a position in a technologically strong foreign firm offering good remuneration and promotion prospects, this move may generate welfare-enhancing opportunities through intrapreneurship. Therefore, policy-making may be directed towards increasing the awareness on the importance of intrapreneurship among private sector actors, especially among large businesses that are capable of devoting more resources to innovation. Hence, an effective government policy supporting entrepreneurial activities within existing businesses may, to some degree, counterbalance the reduced entrepreneurship rates stemming from high wages.

5.3 Limitations

The results of this study should be interpreted in the context of potential limitations. First, the presence of foreign firms is likely to be endogenous, while our empirical approach treats FDI as a predetermined variable. Although we control for the most common observed (and unobserved) factors that the literature identifies to explain wages and competition, and in addition we use 3SLS which allows disturbances to be correlated across equations, we cannot completely rule out that endogeneity of FDI affects our results. For instance, it is conceivable that foreign investors "cherry pick" the best performing target firms, which, for example, already employ high-quality labor and pay higher wages than the average domestic firm. Neglecting this "cherry picking" implies that the extent of wage premiums offered by foreign-owned enterprises may be overestimated.[12] We expect the

[12] A few studies (e.g., Almeida 2007; Heyman et al. 2007) use matched employer-employee data to address this issue. The

omitted variable bias to be small, as wages are measured at the industry level, and the FDI share is on average 16%, and therefore the wage premium will be relatively small. Furthermore, we show the robustness of our results using lags of FDI to avoid simultaneity bias to affect our results. To completely rule out remaining concerns related to the endogeneity of FDI, one needs a (quasi-)natural experiment, which is however not at our disposal; this is left for future research.

The second limitation is that the FDI variable used in this study only applies to companies with total assets of at least 22.7M€. Fortunately, the vast majority of FDI takes place through companies of this size. Moreover, we weighted FDI with a firm's foreign equity participation divided by its size to avoid possible aggregation bias. Nonetheless, it is important to keep in mind that the FDI effects on new business creation reported in this work pertain to foreign investments in relatively large companies.

5.4 Future research

Developing countries are becoming increasingly important as both recipients and sources of FDI inflows. Owing to the recent economic crisis, FDI to advanced economies fluctuates with a downward trend, and the attractiveness of developing countries is increased as investment destinations. Consequently, it comes as no surprise that in 2012, the share of world FDI inflows to these countries exceeded inflows to developed nations. Given that overall industry structure and labor markets manifest sharp differences across developing and developed countries with the former enjoying a boom in FDI inflows, it would be interesting to replicate the present study in a developing country context.

Second, a future research opportunity is envisioned in relation to taking the heterogeneity in FDI source countries into account. Specifically, the current study depicts the North-North case with regard to the direction of FDI as the lion's share of inflows into the Netherlands originates from advanced countries. In contrast, developing countries attract foreign investment both from advanced and developing economies, meaning that South-South FDI inflows have recently grown in importance. For instance, China receives sizable FDI from Asia's newly developing countries. Likewise, China and South Africa are now major investors in Africa. Chinese FDI in Latin America shows much faster growth than global FDI in the region. Hence, a comparative study may be conducted to find out whether FDI from advanced countries bears different implications on entrepreneurship through concentration and wage channels relative to FDI from developing countries. If the host country is a developing one, we should expect technological proximity to be high with the latter group and low with the former, which may determine the scope of the effects of FDI.

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Appendix A: Concentration-Competition Link

The association between market concentration and competition is well-grounded in industrial organization theory (see Tirole 1988) and particularly in the structure-conduct-performance (SCP) paradigm introduced by Bain (1968). The SCP paradigm suggests that industries characterized by low concentration constrain the conduct of firms with respect to pricing and advertising policies, innovation, etc. Firms comply with the prevailing prices and earn normal profits in the long run. In contrast, a higher level of concentration provides them more freedom in market conduct choices, and is assumed to facilitate collusive activities and anti-competitive practices. High concentration is then taken as an indication of weak competition resulting in high prices and high price-cost margins. Put differently, there is an inverse relationship between the degree of industry concentration and competition (Scherer and Ross 1990).

Since the introduction of the SCP paradigm, numerous empirical studies have resorted to the indicators of concentration to proxy competition, notably the Herfindahl index (see Valta 2012; Xu 2012; Amess and Roberts 2005). If a declining trend is detected in the index over time, this is reflective of that particular industry becoming more competitive. Conforming to previous studies, we also use the Herfindahl index as our proxy for competition. In the literature, alternative

results in both papers show that higher wage premiums in foreign firms, although existent, are lower than previously thought. The data in this study, however, does not allow for such a matching procedure.

Appendix B: Data

Table 4 Variables: descriptions and data sources

Variables	Description	Data source
Entry	Number of domestic firm entries at time t divided by the total number of firms in the same period in industry *i*	Business Register
FDI	Number of employees in foreign firms weighted by the firm's foreign equity participation divided by total employment in industry *i* at time *t*	SFGO
HHI	The sum of squares of market shares of all firms in industry *i* at time *t*	Production Statistics
Wage	Logarithm of the total industry wage bill divided by total employment in industry *i* at time *t*	Production Statistics
Labor	Logarithm of the total number of employees in industry *i* at time *t*	Business Register
Growth	Industry annual employment growth rate	Business Register
MES	Average firm size, defined as total employment in industry *i* divided by the total number of firms in the same industry at time *t*	Business Register
Capital	Industry capital stock divided by total employment in industry *i* at time *t*	SFGO, SFKO, Business Register
R&D	Total R&D expenditures divided by total sales in industry *i* at time *t*	Production Statistics
Advertisement	Total advertising expenditures divided by total sales in industry *i* at time *t*	Production Statistics
Age	Average age of the workforce in industry *i* at time *t*	GBA
Female	Proportion of female employees in industry *i* at time *t*	GBA
Training	Total training costs divided by total employment in industry *i* at time *t*	Production Statistics, Business Register
Skill	Proportion of highly skilled employees who have a college education in industry *i* at time *t*	Educational Level
Region	Proportion of firms in industry *i* at time *t* that are located in the regions North Holland, South Holland and North Brabant	Business Register

International Standard Classification of Education (ISCED) forms the basis for the variable Skill. Employees with educational level 5 or 6 based on ISCED codes are considered as highly skilled. Programs classified at level 5 include, for example, (higher) technical education, community college education, technician or advanced/higher vocational training, and associate degree. Likewise, programs classified at level 6 cover, for example, bachelor's programs, license or first university cycle

measures of competition are also offered, for instance, by Boone (2008), and these measures are compared in their ability to reflect changes in competition (Boone et al. 2007). Nonetheless, with the data we had access to, the Herfindahl index was the most appropriate choice for this study.

Appendix C: Robustness analyses

Excluding one-(wo)man firms

To check the robustness of our findings, we estimated our system of equations by using different subsamples. First, we define a sample excluding one-(wo)man firms (i.e., ZZPs).[13] This sample is an unbalanced panel of 3782 industry-year observations.

One-(wo)man businesses operate under special regulatory and tax conditions in the Netherlands.[14] Since they account for almost 15% of all firms and half of the new firm entries per year and over the sample period in our data set, it is worthwhile to check whether

[13] ZZPs (zelfstandige zonder personeel in Dutch, i.e. independent professional without personnel) are those people who work for themselves but do not hire any other employees.

[14] The Dutch tax regime has been structured in such a way that there are large financial benefits for freelancing: one often has to pay no taxes at all in the first few years. As a result, many people have opted to start one-(wo)man businesses and become a ZZP-er.

Table 5 3SLS results

Sample excludes one-(wo)man businesses			
Entry	Model 1	Model 2	Model 3
Panel A			
FDI_{it}	− .034*** (.011)		
FDI_{it-1}		− .027** (.011)	
FDI_{it-2}			− .029*** (.010)
ln(Wage)	− .032*** (.008)	− .034***(.008)	− .041***(.009)
HHI	.357*** (.076)	.362***(.075)	.489*** (.075)
ln(Growth)	.021*** (.004)	.019*** (.004)	.023*** (.005)
MES	−.005*** (.002)	− .006*** (.002)	− .007*** (.002)
ln(Capital)	.006*** (.002)	.006*** (.002)	.010*** (.002)
ln(R&D)	.0014 (.001)	.001 (.001)	.003 (.001)
ln(Advertisement)	.013*** (.004)	.013*** (.004)	.015*** (.003)
Region	.058*** (.013)	.060***(.013)	.045*** (.013)
Constant	− .0609 (.040)	− .114 (.075)	− .121 (.063)
R^2	0.308	0.296	0.10
Panel B			
ln(Wage)			
FDI_{it}	.546*** (.053)		
FDI_{it-1}		.411*** (.054)	
FDI_{it-2}			.419*** (.054)
MES	− .132*** (.013)	− .127*** (.013)	− .135***(.014)
ln(Capital)	.020*** (.005)	.022*** (.005)	.021*** (.005)
Age	.029*** (.004)	.028*** (.004)	.031*** (.004)
Female	− .702*** (.118)	− .725*** (.120)	− .646*** (.120)
Skill	.184** (.091)	.182** (.092)	.184** (.094)
Training cost	.919*** (.047)	.966*** (.047)	.911*** (.046)
Region	− .055 (.076)	− .065 (.078)	− .048 (.079)
Constant	1.285*** (.288)	1.461*** (.289)	1.340*** (.283)
R^2	.547	.539	.542
Panel C			
HHI			
FDI_{it}	.112*** (.020)		
FDI_{it-1}		.108*** (.021)	
FDI_{it-2}			.086*** (.022)
ln(Growth)	− .008 (.010)	− .004(.010)	− .010(.011)
MES	.005***(.005)	.005***(.005)	.005*** (.005)
ln(Capital)	−.020*** (.002)	− .020*** (.002)	− .021*** (.002)
ln(R&D)	− .005*(.003)	−.005* (.003)	−.005 (.003)
ln(Advertisement)	− .033*** (.003)	− .033*** (.003)	− .032*** (.003)
Region	− .044 (.030)	− .048 (.030)	− .017 (.032)
Constant	1.039*** (.083)	.704*** (.066)	1.032*** (.092)
R^2	.547	.545	.554
Obs.	3782	3780	3526
Total effect of FDI	− .012	− .002	− .004

Robust standard errors in parentheses, year, and industry effects are included

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

Table 6 High technology vs. low technology

	Full sample		Sample excludes one-(wo)man businesses	
Entry	High tech	Low tech	High tech	Low tech
Panel A				
FDI	.021 (.016)	− .071***(.016)	.021(.016)	− .064*** (.016)
ln(Wage)	− .045*** (.017)	− .028***(.010)	− .040** (.017)	− .026*** (.010)
HHI	.200*(.108)	.576*** (.093)	.156 (.109)	.498***(.097)
ln(Growth)	.023*** (.005)	.025*** (.006)	.023*** (.005)	.023*** (.006)
MES	0.001 (.004)	− .009*** (.0031)	− .001 (.003)	− .007*** (.003)
ln(Capital)	.0005 (.002)	.014*** (.003)	.001 (.002)	.012*** (.003)
ln(R&D)	.004*** (.001)	.003* (.002)	.003** (.001)	.002 (.002)
ln(Advertisement)	.003 (.007)	.019*** (.004)	.002 (.007)	.017*** (.004)
Region	.050 (.046)	.046*** (.016)	.040 (.041)	.057*** (.015)
Constant	0	− .239*** (.066)	.123* (.066)	− .199*** (.068)
R^2	0.6021	0.5695	0.6887	0.6119
Panel B				
ln(Wage)				
FDI	.438*** (0.086)	.578*** (.063)	.434*** (.088)	.573*** (.064)
MES	− .102*** (0.021)	− .166*** (.018)	− .092*** (.019)	− .143*** (.016)
ln(Capital)	.005 (.007)	.020*** (.006)	.007 (.007)	.020*** (.006)
Age	.049*** (.008)	.025*** (.005)	.047*** (.009)	.026*** (.005)
Female	− .685*** (.240)	− .675*** (.135)	− .894*** (.250)	− .759*** (.138)
Skill	.620*** (.154)	.093 (.107)	.649*** (.159)	.048 (.110)
Training	1.262*** (.075)	.816*** (.056)	1.288*** (.076)	.833*** (.057)
Region	.132 (.150)	− .013 (.094)	− .028 (.138)	− .073 (.090)
Constant	.124 (.375)	1.555*** (.317)	.291 (.393)	1.468*** (.322)
R^2	.635	.529	.632	.529
Panel C				
HHI				
FDI	.129*** (.048)	.121*** (.023)	.128*** (.048)	.124*** (.023)
ln(Growth)	.017 (.019)	− .019 (.012)	.018 (.019)	− .016 (.012)
MES	.005*** (.001)	.005*** (.007)	.004*** (.001)	.004*** (.006)
ln(Capital)	.004 (.004)	− .028*** (.003)	.005 (.005)	− .027*** (.003)
ln(R&D)	− .0002733 (.005)	− .008** (.003)	− .0001 (.005)	− .007** (.003)
ln(Advertisement)	− .051*** (.007)	−.028*** (.004)	− .051*** (.007)	− .030*** (.003)
Region	− .241*** (.080)	.001(.035)	− .245*** (.071)	− .016 (.033)
Constant	.871*** (.082)	.664*** (.067)	.855*** (.078)	1.028*** (.084)
R^2	.448	.582	.448	.583
Obs	1048	2736	1042	2736
Total effect of FDI	.027	− .018	.024	− .017

Robust standard errors in parentheses, year and industry effects are included

***$p<0.01$, **$p<0.05$, *$p<0.1$

previously discussed results are sensitive to the exclusion of these firms. Estimates derived from this subsample are displayed in models (1) through (3) of Table 5 in the same way as before.[15] A quick look at these alternative models suggests that the results are by and large in agreement with those obtained from the analysis of the whole sample.

High- vs. low-technology industries

The above analysis assumes homogeneity of manufacturing industries. However, industries with different underlying structures may have particular sensitivities to FDI. Due to the differences in, for example, the degree of innovation capacity, or the sources and directions of technical change, the effects of FDI on firm entry may not be uniformly distributed across industries. This predominantly applies to the differentiation between high- and low-tech sectors. In addition, Table 3 shows that there is a significantly positive effect of R&D intensity on entrepreneurship, suggesting a possible role of technological competencies of different industries. Therefore, it would be worthwhile to test developed hypotheses in Section 2 considering technology advantages of firms. Thus, similar to Barbosa and Eiriz (2009), we replicate our analysis separately using subsamples of high- and low-tech Dutch manufacturing industries. The breakdown according to technological intensity is based on NACE Rev. 1.1. which is provided by Eurostat.[16] High-tech group covers the codes 24, 29-35 (except for 35.1) and low-tech group covers 15-23, 25-28, 35.1, 36, and 37. Appendix E displays the list of industries assigned to each subsample in detail.

[15]Industries in our data set are very narrowly defined: at the five-digit. Two of our 252 industries (in a given year) consist of only one-(wo)man firms. Therefore, when these firms are excluded in the robustness checks, these two industries drop out of our sample. The original sample size is then reduced by two observations from 3784 to 3782 in the robustness analysis. In contrast, the remaining 250 industries consist of both one-(wo)man and other firms and we can still compute all of our industry-level variables in a similar way as before. This means that all of these 250 industries remain in the sample used in the robustness analysis.

[16]Eurostat uses the following aggregation of manufacturing industries according to technological intensity: high technology, medium high technology, medium low technology, and low technology. We combine the first two categories and label it as high tech, and subsequently merger the last two categories and label it as low tech.

The estimation results are presented in Table 6 for both the whole sample and sample excluding one-wo(man) businesses. Comparing the results, we find striking differences in the way FDI affects gross entry. Specifically, the negative direct effect of FDI only prevails in the low-tech group, and it disappears in the high-tech sector. To illustrate, 10% increase in FDI measured as the share of foreign employment reduces gross entry rates in low-tech sectors by 0.71% and 0.64% in the samples including and excluding one-(wo)man businesses, respectively. This suggests that domestic innovative and absorptive capacity in knowledge intensive industries is (more) complementary to new technologies and know-how of foreign firms. This complementarity may provide sufficient incentives for entrepreneurs to enter high-tech industries and seemingly compensate for the negative consequences of FDI which is found to be more applicable to low-tech industries. Our finding for high- and low-tech industries is similar to the finding of Barbosa and Eiriz (2009), who did not trace any significant effect of FDI on firm entry for the high-tech subsample.

HHI almost has no effect on entry in high-tech while its coefficient has a significant positive sign in low tech, suggesting that higher concentration stimulates entry only into the latter group. Wages are negatively linked to gross entry rates in both subsamples, which is in line with our main results. Finally, Table 6 also shows that while the total FDI effect is positive for high-tech industries, it is negative for low-tech ones.

Appendix D: Economic significance

Here, we discuss the economic significance of our estimates. Table 7 displays the size effects of a subset of the models included in Tables 3 and 5. The economic effects are calculated as the percentage change in the dependent variable with respect to a 10% increase in the relevant independent variable. Values in columns (1) to (3) are based on models (1) to (3) in Table 3 drawing on the whole sample. Columns (4) to (6) correspond to the economic effects of the results presented in Table 5, the estimation for robustness check. We see that a 10% increase in FDI coincides with an increase in market concentration of 1.1%. The effect of FDI on wages is economically larger. A 10% increase in FDI is associated with an increase of 5.5% in industry wages. The channel effects of concentration

Table 7 Economic significance

	Full sample			Sample excludes one-(wo)man businesses		
Entry	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Panel A						
FDI_t	− .4			− .34		
FDI_{t-1}		− .32			− .27	
FDI_{t-2}			− .31			− .29
ln(Wage)	− 3.6	− 3.8	− 4.3	− 3.2	− 3.4	− 4.1
HHI	4.43	4.5	5.5	3.6	3.62	5
Panel B						
ln(Wage)						
FDI_t	5.5			5.5		
FDI_{t-1}		4.23			4.11	
FDI_{t-2}			4.34			4.2
Panel C						
HHI						
FDI_t	1.1			1.12		
FDI_{t-1}		1.06			1.1	
FDI_{t-2}			.83			.86

Economic significance is calculated as the percentage change in the dependent variable with respect to a 10% increase in the relevant independent variable

and wages on entry are both smaller. A 10% increase in industry wages translates into a decrease of 3.6% in gross entry rates. For market concentration, an increase of 10% translates into an increase of 4.43% in entry rates. A similar picture emerges in the subsequent columns (3) to (6). In summary, the economic effects of FDI on wages are the largest among the relationships depicted in Table 7. The effects of wages on entry are a bit smaller, which slightly diminishes the power of this channel. Additionally, these reduced effects of wages on gross entry rates are neutralized by the counter effect of the second channel, market concentration. In other words, although the indirect effect of FDI on entry through the wage channel might initially appear troublesome, the effect is: (i) is weakened on its way through the channel and (ii) is offset by the counter effects between FDI, market concentration, and entry rate.

Appendix E: Dutch Manufacturing

Table 8 Manufacturing industries according to technological intensity

	NACE two-digit industry code
High-technology industries	
Manufacture of chemicals and chemical product	24
Manufacture of machinery and equipment n.e.c	29
Manufacture of office machinery and computers	30
Manufacture of electrical machinery and apparatus n.e.c	31
Manufacture of radio, television and communication equipment and apparatus	32
Manufacture of medical, precision and optical instruments, watches and clocks	33
Manufacture of motor vehicles, trailers and semi-trailers	34
Manufacture of other transport equipment (excluding building and repairing of ships and boats)	35 (excluding 35.1)
Low-technology industries	
Manufacture of food products, beverages and tobacco; textiles and textile products; leather and leather products; wood and wood products; pulp, paper and paper products, publishing and printing	15 to 22

Table 8 (continued)

	NACE two-digit industry code
Manufacture of coke, refined petroleum products and nuclear fuel	23
Manufacture of rubber and plastic products; basic metals and fabricated metal products; other non-metallic mineral products	25 to 28
Building and repairing of ships and boats	35.1
Manufacturing n.e.c.	36 to 37

Eurostat

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