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Internationalization, Product Innovation and the moderating Role of National Diversity in the Employment Base

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Abstract: The effects of establishing foreign-based subsidiaries on firm performance have long been debated, where empirical evidence hints at gains in terms of costs reductions, productivity or growth. Yet, little is known about the effects on innovative capabilities at the home base. Using a matched-employer-employee panel dataset of the Swedish Community Innovation Surveys (CIS) between 2008 and 2014, we estimate whether the employee share at subsidiaries abroad affects product innovation performance at home. Our results show the effects are positive on average. However, there is also evidence of detrimental effects of having employees abroad on innovation. In particular, for excessive shares of employees at foreign location, we provide evidence of an inverted u-shape between the probability to introduce product innovations and the share of foreign employment. Moreover, we show that the benefits of foreign employment are larger for firms with a more nationally diverse workforce at the home base. Our results are robust to a wide variety of robustness checks.

Keywords: Internationalization; Innovation; Diversity

JEL-Codes: M14; M16; O32

1 Motivation

Over the last decades, firms have increasingly internationalized their activities (Kano et al. 2020). The effects of this increasing international integration have been addressed in a number of studies with respect to financial/economic performance measures such as productivity (Tang and Livramento 2010, Nieto et al. 2013, Castellani et al. 2016). The innovation-related effects have however received relatively scarce attention, with most studies looking at narrower question of how offshoring of core innovation activities affect innovation performance (Nieto and Rodriguez 2011, Fifarek et al. 2008, Rodriguez and Nieto 2016, Steinberg et al. 2017). The results appeared to be mildly positive on average but probably are context-specific and may not only bring benefits but also costs (Baier et al. 2015) where we are far from having a full understanding of the complexities. Beyond the ambiguity in the effects of internationalization of innovation, a second gap in the literature results from the fact that the effects of internationalization in general (i.e. irrespective of whether it relates to innovation activities) hardly been analyzed (see Mihalache et al. 2012 for an exception). Arguably, this gap may even of even greater practical relevance, because general internationalization is considerably more wide-spread than the internationalization of innovation. Thus, internationally active firms may need to assess the effects on innovation performance even if they did not internationalize innovation.

This paper contributes to filling this gap by analysing inasmuch the share of employees abroad effects product innovation at the home base. Taking into account the ambiguities, a) there is unlikely to be a monotonous relationship between the increasing integration into global value chains because of the existence of costs and benefits (Baier et al. 2015) and b) the effects are likely to depend on various contextual factors (compare Steinberg et al. 2017). In particular, following Mihalache et al. (2012), we argue that diversity of the employee-base will moderate the internationalization-innovation-performance relationship. Specifically focusing on national diversity, we argue that firms with more diverse employee-bases are able to take greater advantage of the internationalization benefits e.g. in terms of better access to and knowledge of foreign markets (Cuervo-Cazzuro et al. 2016, Meyer et al. 2009 Meyer 2015) while reducing costs associated with the maintenance of an international network of firm operations (Ceci and Prencipe 2013).

To analyze this question, we match the Community Innovation Survey (CIS) from 2009, 2011, 2013, and 2015 to data on the employment Swedish firms have abroad. The main findings are as follows: First, we show that a higher share of employment abroad is associated with a higher likelihood to introduce product innovations. Second, the results indicate the existence of an upper bound to internationalization benefits, beyond which the effects of further increases in the share of foreign employment are associated with a decreasing likelihood to introduce product innovations. Third, the overall gains in term a higher likelihood are larger if the firm has a nationally diverse employee base.

The contribution of this paper is threefold. First, it provides and tests empirically a rich framework, which allows for the simultaneously existence of innovation-related costs and benefits resulting from firm internationalization. The paper thereby contributes to a better understanding of how international operations affect home base innovation. Second, we argue that the costs and benefits will play out differently depending on context, in our case the national diversity in home base operations. This allows avoiding oversimplified claims to the effects of running and maintaining international operations on home-base innovation. Third, by addressing the central role of national diversity the results also holds implications for diversity research. While the effects of national diversity on firm performance were often found to be negligible (Schubert and Tavassoli 2020, Østergaard et al. 2012) or at best non-linear (Dahlin et al. 2005), our results show that national diversity may have positive effects on innovation. However, its role may be that of a positive moderator in highly international contexts rather than contributing directly in every context.

2 Theory

The past thirty years has shown a marked increase in firms' integration into global value chains (Kano et al. 2020). That is supported by hard figures. Schwörer (2012, Table 1) finds that for Europe the share of sourcing from other countries has increased between 1995 and 2008 by about 40%. Beyond generic international sourcing, firms have also reached high levels of direct activities abroad. Castellani et al. (2016) provide evidence that in the approximately 2,800 most R&D-intensive firms the about 33% of all subsidiaries where located outside the firm's home country. From an organizational perspective, offshoring-related internationalization activities are either of the captive or the non-captive type (Mudambi 2008). Captive offshoring or internationalization refers to a situation where a firm runs operations at foreign locations inside the boundaries of the own firm, i.e. it retains some sort of ownership control. The non-captive type is also referred to as offshore internationalization and means that the firm sources or sells goods or services in foreign locations. Research on the performance effects of such internationalization activities have been burgeoning in the past having yielded evidence on both benefits, e.g. in terms of lower production costs (Levitt 1993, D'Attoma and Pacei 2014), economies of scale and scope provided by large international suppliers (Grossman and Helpman 2005) or better access to and knowledge of foreign markets (Castellani and Zanfei 2006, Castellani et al. 2016) as well as costs, e.g. in terms of greater fragmentation (Kedia and Mukherjee 2009), managerial complexity (Baier et al. 2015) and loss of control (Ceci and Prencipe 2013). The overall effects remain however somewhat ambiguous. As far as less-knowledge intensive functions are internationalized the effects of lower production costs often outweigh the associated costs resulting from principal agent problems (Ceci and Prencipe 2013). For highly knowledge-intensive functions, innovation in particular, the story may be different because of substantially inflated costs (Fifarek et al. 2008). A further complication is that the costs and benefits are likely to be affected by specific contingency factors moderating the mechanisms, which cause costs and benefits. Until now however only few works have addressed the effects of captive internationalization on home base innovation at all (Mihalache et al. 2012, Fifarek et al. 2008), implying there is very little evidence on the effects of a firm's degree of internationalization on its innovation performance. This paper intends contributing to filling this gap by developing rich theoretical framework, which addresses costs and benefits of captive internationalization on home base innovation simultaneously while also allowing trade-off between cost and benefits to depend on context factors, with a specific focus national diversity as a moderator (compare Mihalache et al. 2012).

2.1 International operations and home base innovation

A number of studies have addressed the question how internationalization of innovation affects various dimensions of firm performance, including for example effects organizational adaptability (Baier et al. 2015) or innovation performance (see Lahiri 2010, Kotabe et al. 2007, Nieto and Rodríguez 2011, Steinberg et al. 2017, Rosenbusch et al. 2019). While these studies display mixed results depending on the dimension of firm performance under consideration, they do in fact hint at positive effects of internationalization of innovation on innovation performance. Advantages, which are associated with the offshoring of innovation are lower costs, greater flexibility to access to talent and a more diverse set of knowledge sources as well as improved knowledge of foreign markets allowing for tailor-made goods and services (Rosenbusch et al. 2019, Doh et al. 2009, Lewin et al. 2009, Cuervo-Cazzuro et al. 2016). While these studies have considerably increased our understanding of how home base innovation may be affected by internationalization there are a number of criticisms. First, the analysis of the effects of internationalization of innovation on innovation performance runs a risk of treating innovation implicitly as separated from other firm functions, which may themselves may be internationalized to various degrees. The innovation literature has however been keen to highlight that innovation is a complex process which is highly intertwined with many other firm-internal functions including production, sales, or marketing (Schubert and Tavassoli 2020) as well as embedded in external networks with suppliers, innovation partners, and customers (Fifarek et al. 2008). Such embeddedness in internal networks of intertwined firm functions and external networks of partners implies that not only the internationalization of innovation but potentially of any firm function may affect home base innovation performance. Moreover, the studies focusing on the IO-IP-relationship have taken a somewhat optimistic focus on the benefits of internationalization of innovation by paying comparably less attention to the cost side. Fifarek et al. (2008) have argued in particular that geographically separating crucial functions contributing to innovation would disturb the balance in external innovation networks of the internationalizing firm, which would ultimate weaken the ability to contribute to and gain from these networks and thereby would reduce innovation performance. Ceci and Prencipe (2013) point to a similar effect also from a purely firm-internal perspective, because geographically separating intertwined firm functions will induce all sorts of principal-agent problems resulting from the declining effectiveness of monitoring and supervision. Thus, a priori it is unclear whether (even less so under which conditions) benefits outweigh costs or vice-versa. Such an integrated analysis of the trade-off of costs and benefits was also hampered because most authors have attempted to provide evidence of the either specific costs or benefit-mechanisms, but have not sought to model the

whole trade-off within one unified framework (compare Rosenbusch et al. 2019, Kedia and Mukherjee 2009).

One attempt to analyze costs and benefits of IO simultaneously is found in Baier et al. (2015), who develop a model based on complexity theory (Simon 1962, Simon 2002) and argue that geographical separation creates both disintegration advantages as well as disintegration disadvantages. In complexity theory, efficient organization organizations are designed on the basis of the modularity principle. Modularity, in short means that firm functions that are independent can (and effectively should) be separated from each other, while interdependent function should remain integrated. Because internationalization is a means of creating (geographical and organizational) separation, internationalization can be seen as a mechanism governing the degree of integration/disintegration of firm function. Indeed, Baier et al. (2015) provide evidence of an inverted u-shape-relationship between IO and organizational adaptability of the firms, which, in their framework, results from disintegration advantages outweighing disadvantages for low levels of IO and disintegration disadvantages outweighing advantages for high levels of IO.

Although, the focus of this paper is on the effects of general captive internationalization (and not just IO) on IP (instead of organizational adaptability), the complexity-understanding put forth by Baier et al. (2015) can still hold highly valuable implications. Most notably, disintegration advantages associated with will result from the ability to tap into globally dispersed knowledge sources (Meyer 2016), access global talent flexibly (Lewin et al. 2009), adapt goods/services to local needs/tastes (Dunning 1993, Cuervo-Cazzura and Narula 2015, Schubert et al. 2018) or benefit from lower costs freeing resources for home base innovation (Fifarek et al. 2008). Disintegration disadvantages derive from a reduced ability to manage effectively a globally dispersed network of operations, in particular when the degree of disintegration associated with internationalization becomes excessive. Further problems include reduced effectiveness in knowledge flows, which may result from time differences, the replacement of face-to-face meetings with impersonal, typically digital, communication channels. Overall, the geographical (on top of organizational) distance may imply a higher need for codification of knowledge, which often is associated with a severe loss of tacit components. The disadvantages are aggravated when opportunisms chips in as well. Then, geographical separation additionally leads to principal-agent problems (Ceci and Precipe 2013), when for example subsidiaries become difficult to monitor and to control, eventually leading them to follow the idiosyncratic interests of local managers instead the overall good of the firm. In general, geographical separation hampers communication and control, which in turn may affect negatively trust and knowledge sharing between

headquarters and subsidiaries (Li et al. 2006) potentially offsetting gains resulting from better access to local knowledge sources abroad.

We conclude our discussion with H1 and H2, which taken together hypothesize an inverted u-shape-relationship between captive internationalization and innovation performance:

H1: The increasing the degree of captive internationalization affects innovation performance positively for low levels of captive internationalization.

H2: Increasing the degree of captive internationalization affects innovation performance negatively for high levels of captive internationalization.

2.2 National diversity as a contextual factor

H1 and H2 suggest the existence of a trade-off of benefits and costs of captive internationalization on home base innovation, which is governed by the simultaneous existence of disintegration advantages and disintegration disadvantages set out by complexity theory (Baier et al. 2015). The value of complexity theory to describe this trade-off results from its specific view on task interdependence and efficient cross-organizational communication and knowledge flows. The focus on the organization of knowledge flows makes this theory particularly appealing for the analysis of innovation in MNCs, because a major competitive advantage of MNCs is their ability access and recombine globally dispersed knowledge sources (Le at al. 2020, Michalache et al. 2012, Subramananian and Venkatraman 2001), in particular through its geographically dispersed network of operations (Belderbos et al. 2020). Knowledge however is difficult to transfer across organizational and geographical context (Griffith, Harrison & Van Reenen, 2006; Todo & Shimizutani, 2008; Nieto & Rodriquez, 2011; Berry, 2014; Kafouros, Buckley & Clegg,2012; Belderbos et al., 2015; Song and Shin, 2008; Belderbos, 2001), where the actual costs of organizing effective knowledge flows is likely to depend on specific organizational set-ups of the organization (Schubert et al. 2018). An organizational feature that has received particular attention in shaping such costs is diversity among employees generally or as in Mihalache et al. (2012) and Belderbos et al. (2020) subgroups of employees, top managers in particular. One reason is that although foreign subsidiaries provide access unique knowledge sources, that access largely represents a potential for recombination but does not necessarily imply effective exploitation. What is important is a high capacity of the home base to integrate that knowledge and turn it into identifiable elements in its knowledge pool (Lisak, Erez, Sui & Lee, 2016; Phene & Almeida, 2008; Berry, 2014; Belderbos, Jacob, Lokshin, 2018). Belderbos et al. (2020) have for example argued that diversity in top management teams affects this capacity positively,

because diversity endows top managers with relevant skills and knowledge necessary for integration, including for example information about the national contexts the knowledge originates from. Mihalache et al. (2012) argue that diversity increases cognitive capacity, which ability to manage internationally dispersed operations as it allows more accurate interpretations of foreign environments and their specific cultural and institutional setting (Black et al. 1991, Roth 1995). While this argument takes are skill-based, a further argument there are also psychological arguments in favor of beneficial effects of diversity. Barriers to knowledge transfers and integration are often cognitive in the sense that individuals access, use, recombine and thereby accept or reject knowledge elements. The likelihood of rejecting certain knowledge elements becomes the larger the more the knowledge differs from own knowledge. Diversity research has for example highlighted that knowledge coming from different social backgrounds are likely to be considered less relevant (Harrison and Klein 2008, Schubert and Tavassoli 2020). More generally, Gestalt Theory suggests that such categorization processes are not only socially construed but also deeply psychologically rooted. In particular, the Gestalt-principle of similarity describes the often involuntarily made assumption that things that are similar belong together and things that are dissimilar do not belong together (Wertheimer 1923). In an international context, knowledge originating from foreign locations may therefore be considered dissimilar from the perspective of employees in a non-diverse home base and in turn rejected. An internationally diverse home base instead may create small breaches and cracks through which such knowledge may make its way into the home base.

H3: The inverted u-shape relationship between captive internationalization and innovation is positively moderated by national diversity in the work force of the home base.

3 Data and Identification

3.1 Data

The data used to test the hypotheses is taken from the Swedish Community Innovation Survey (CIS) performed in 2009, 2011, 2013, and 2015 The CIS is a bi-annual survey of innovation activities of enterprises in all member states of the EU and is mandated by the European Commission. The CIS is based on a stratified random sample of enterprises located in Sweden that have their main economic activity in mining, manufacturing, energy and water supply, sewerage and remediation, wholesale trade, transportation and storage, information and communication services, financial and insurance activities, and other business-oriented services. Besides general firm level characteristics, the CIS includes in particular information on the innovation activities of firms, including for example whether the firm introduced product or service innovations. To the CIS, we match data on the activities of Swedish firms abroad, which we take from the database on Swedish-owned firms with subsidiaries in foreign countries (SVIK). Additional firm-level information and baseline characteristics and financials comes from the Swedish business register (FEK). Information on the educational backgrounds of the employees is taken from then integrated labor market database (LISA). To have the same reference years as in the CIS survey data, all data from SVIK, FEK, and LISA is lagged by one year, so that the effective observational periods are 2008, 2010, 2012, and 2014. This combined dataset allows us to analyze whether the degree internationalization as measured by the share of employment a firm has abroad systematically affects the likelihood to become product innovator, and whether this likelihood is moderated by the national diversity in the employee base.

3.2 Identification Strategy

Key explained and explaining variables: Our key explained variable is whether a firm has introduced a product innovation. This variable is binary and takes the value of 1 if a firm successfully introduces at least one product innovation within the last three years (*Product innovation*). Following the third revision of the OSLO-Manual (OECD 2005) a product innovation is defined as a successful market introduction of a new or significantly improved good with respect to its capabilities, user-friendliness, components, or subsystems. This variable measures innovation output directly and thereby differs from intermediate measure such as patents. While intermediate measures are suitable to capture “invention” (not necessarily the market implementation of that invention), product innovations are more in-line line with the Schumpeterian definition, which requires introduction into the market (Kleinknecht, Van Montfort, & Brouwer, 2002).

The key explaining variable is the share of employees each firm has at foreign locations. While principally the data provided by SCB relates only the activities the firms have inside Swedish

boundaries, the SVIK data provides population information on the total number of employees working in subsidiaries abroad, which are owned by Swedish based firms. This allows us to create a comprehensive measure of internationalization by dividing employees located at foreign locations by the total number of employees of the focal firm including all of its subsidiaries (*Share employees foreign locations*). In general, H1 and H2 are about the specific relationship between *Share employees foreign locations* and *Product innovation.*

The moderator in H3 is the national diversity of the employee base. While there are a number of alternative ways of measuring diversity such as the Blau-Index and Teachman's entropy index, the results often do not differ greatly in practice. Because of that Harrison and Klein (2007) treat them as equivalent. Eventually, we decided to follow Schubert and Tavassoli (2020) and chose the entropy index, which is rooted in information processing and communication theory, which captures more closely the diminishing returns associated with additional information (Shannon, 1948). In specific, over J country groups, national diversity is defined as follows:

$$National\ diversity_{it} = \sum_{j=1}^{J} nationality\_share_{i,t,j}\ ln\ (\frac{1}{nationality\_share_{i,t,j}})$$

where, $nationality\_share_{i,t,j}$ is the share of employees in nationality group j. Our data groups individuals into the following groups: Swedish, Nordic countries, EU15[1], Europe (except EU15 and Nordic countries), Africa, North-America, South-America, Asia, and Oceania. The Teachman Entropy Index ranges from a minimum of zero to a maximum of -ln(K), where K=9 refers to the number of categories.

Control variables: We include a number of control variables that may be relevant to explain whether a firm is innovation-active or not and which could potentially confound the effects of the share of employees at foreign locations. To start with, we control for the main input into innovation by including R&D expenditures as a share of turnover (R&D intensity). Furthermore, Because many studies show that innovation systematically varies by firm size, we control for size of the firm by including the number of employees (*Employees*). To capture the capital intensity of firms, we included a variable that measures the sum of investments (value in million Swedish

[1] EU15 comprises Belgium, Denmark, Germany, Finland, France, Greece, Great Britain, Italy, Ireland, Luxembourg, Netherlands, Austria, Portugal, Sweden and Spain.

krona) in buildings and machines (*Physical capital*). Physical capital can be important to control for because improvements in the production technology the result of by capital-embodied technological change (Castellani et al. 2019). We include a variable for the labor productivity of the firm, which is measured by total turnover divided by the total number of employees (*Productivity*). Productivity can the thought of a rough proxy of the firm's technological capabilities, which are closely linked to innovation. Finally, to account for general sector differences potentially affecting, we used sector dummies corresponding to the one-digit categories in the NACE industrial classification.

Methodology: The dependent variables in all hypothesis is a binary variable for whether the firm is a product innovation. This suggest the use of probit models. All models consider the panel nature of the data by computing standard errors based on clustering cross-sectional observations. An important concern that may prevent consistent identification is related to the presence of unobserved heterogeneity. Although our data is particularly rich in terms, typically not every aspect that may confound the main effects can be incorporated explicitly. The panel data available in our setting, however, allows us to control for time-constant unobserved heterogeneity by using fixed-effects type of regressions. While in principal, there exists a full fixed-effects estimator for panel-probit which is based on a sufficient conditioning statistic, this estimator relies only on observations, which change status over time. Since most firms are consistent innovators/non-innovators in all periods, the full-fixed effects estimator is undesirable. A more-convenient approach to include Mundlak-type of correction terms as proposed for non-linear models by Wooldridge (2005). Mundlak-terms are unit-specific time averages of the explaining variables. Including them implies that the coefficients on the time-varying versions are only driven by the year-to-year changes in them rather by their levels. Interestingly, the Mundlak correction in non-linear models has desirable properties also as concerns the calculation of the size of the effects.

While standard formulae for the marginal effects do not in fact yield the marginal effect, Wooldridge (2005) showed that they still are equal to the average partial effect.

4 Results

4.1 Testing the Hypothesis

Table 1 presents descriptive statistics for the key explained, key explanatory as well as the control variables. We see that 40% of the firms in the CIS-sample have introduced new or significantly improved products during the last three years before the survey. The share of employees at foreign locations is in the CIS-sample relatively high and averages at 30%. We also note that the average national diversity as measured by the Teachman-entropy is 0.15, with however a minimum of 0 (indicating zero diversity) and a maximum of 1.67. Because the CIS principally addresses a broad population of firms, there is great heterogeneity in terms of firm size. The average firm has 147 employees. The smallest, however, has only one, while the largest firm in the sample exceeds 20,000 employees.

Table 1: Descriptive statistics

Variable	N	Mean	SD	Min	Max
Product innovator	9105	0.40	0.49	0.00	1.00
Share employees foreign locations	9105	30.00	15.81	0.00	100.00
National diversity	9105	0.15	0.20	0.00	1.67
Employees	9105	147.56	786.00	1.00	28600.00
R&D intensity	9105	78.69	7485.70	0.00	7.14e+05
Labor productivity	9105	8.14e+05	2.00e+06	77.09	9.17e+07
Capital intensity	9105	0.50	30.01	0.00	2847.60

Table 2 presents the main results for the firms' probability to introduce product innovations. Indeed in Model 1, we see that a higher share of foreign employment is associated with a higher likelihood of product innovations, as the coefficient for the share of foreign employees is significantly positive. That baseline result holds also when we introduce the Mundlak-correction for correlated fixed effects in Model 2. Considering the size of the effects, we see that a 10 percentage point increase in the share of foreign employees implies a 3 percentage point increase in the probability to be product innovator. Given that the average firm in the sample has 30% of its employees abroad, it also means that the average firm is approximately 9 percentage points more likely to be product innovator than a firm with without employees abroad.

While Models 1 and 2 provide evidence of positive of having employees abroad on innovation performance on average, we also highlighted that there may be upper thresholds above which further increases in foreign employment shares become dysfunctional. Model 3 (without Mundlak-correction) and Model 4 (with Mundlak-correction) therefore include also the squared

term of the share of foreign employees. Indeed, we see that the square term turns negative, which implies that the innovation-effect of foreign employee shares follows an inverted u-shape with an upper optimal threshold. The left panel of Figure 1 plotting the marginal effects shows that this threshold is slightly above 50% (i.e. the locus where the marginal effect switches from positive to negative).

Table 2: The innovation effects of foreign locations (product innovators, baseline)

	(1)	(2)	(3)	(4)
Share employees foreign locations	0.0036***	0.0033***	0.0102***	0.0111***
	(8.83)	(9.00)	(8.98)	(8.84)
Employees	0.0000*	0.0000*	0.0000*	0.0000*
	(2.24)	(2.22)	(2.37)	(2.34)
R&D intensity	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-9.23)	(-9.49)	(-8.87)	(-9.27)
Labor productivity	-0.0000	-0.0000*	-0.0000*	-0.0000*
	(-1.86)	(-2.02)	(-2.05)	(-2.17)
Capital intensity	-0.0003	0.0002	-0.0002	0.0003
	(-1.07)	(0.10)	(-1.17)	(0.16)
Square: Share employees foreign locations			-0.0001***	-0.0001***
			(-6.31)	(-6.26)
Year dummies	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes
Mundlak FE-correction	No	Yes	No	Yes
Observations	9105	9105	9105	9105
Pseudo R^2				

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In H3, we argued that national diversity will moderate positively the effects of the share of employees abroad on innovation. In Table 3, we test this hypothesis by interacting the share of foreign employees with national diversity in the employee base. In particular, Models (3) and (4) show that the interaction between the (linear term of the) share of foreign employees is positive and significant. Because marginal effects of interactions in non-linear regression are not consistent tests of the absence or presence of complementarity or substitution effects (Cornelißen and Sonderhof 2008), we plotted the marginal effects of the share of foreign employees for the

probability to introduce product innovation in the right panel of Figure 1 for different levels of national diversity. Because of the non-linearity of the probit regression, the relationships are complex. However, we do discern that for most values of the share of foreign employees the marginal effects are lowest when the degree of national diversity is lowest. That implies that indeed higher national diversity boosts the effects of higher shares of foreign employment. It is also worth noting that the linear and the squared term of the foreign employment share remain largely unchanged both in terms of significance and size of the effect.

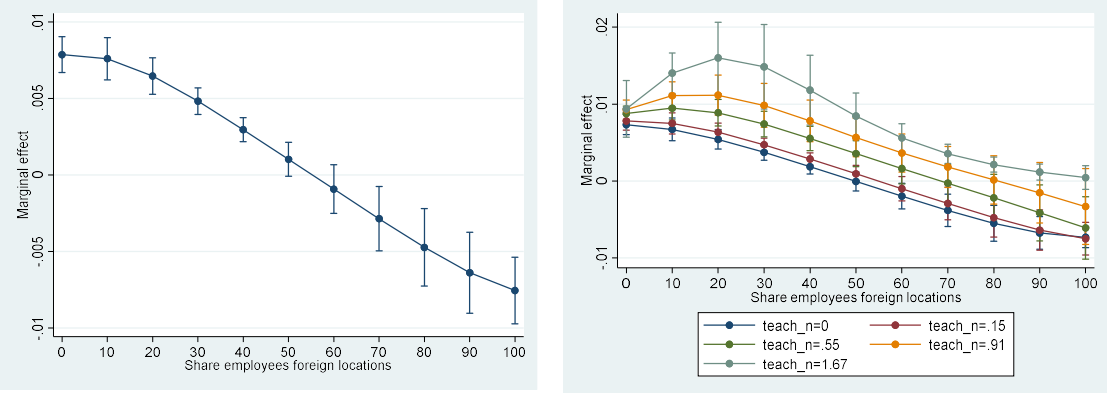
Table 3: The innovation effects of foreign locations (product innovators, interaction w. national diversity)

	(1)	(2)	(3)	(4)
Share employees foreign locations	0.0025***	0.0025***	0.0100***	0.0100***
	(5.00)	(5.01)	(7.80)	(7.80)
(Share employees foreign locations)*(National diversity)	0.0068***	0.0068***	0.0069***	0.0069***
	(3.47)	(3.46)	(3.66)	(3.65)
National diversity	-0.1188	-0.1200	-0.1270	-0.1283
	(-1.77)	(-1.79)	(-1.92)	(-1.93)
Employees	0.0000*	0.0000*	0.0000*	0.0000*
	(2.23)	(2.21)	(2.36)	(2.34)
R&D intensity	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-9.09)	(-9.49)	(-8.82)	(-9.23)
Labor productivity	-0.0000	-0.0000*	-0.0000*	-0.0000*
	(-1.86)	(-2.00)	(-2.05)	(-2.15)
Capital intensity	-0.0003	0.0002	-0.0002	0.0003
	(-1.13)	(0.13)	(-1.21)	(0.18)
Square: Share employees foreign locations			-0.0001***	-0.0001***
			(-6.24)	(-6.23)
Year dummies	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes
Mundlak FE-correction	No	Yes	No	Yes
Observations	9105	9105	9105	9105
Pseudo R^2				

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In the case of the squared effects, the results relating to national diversity hold with respect to the probability of introducing product innovations.

Figure 1: The effects of foreign locations (product innovators, baseline & interaction w. national diversity)



4.2 Further Results and Robustness Checks

We have tested a number of alternative specification in order to address the robustness of the results.

First, a concern about consistent identification of the models in Table 2 and Table 3 may be that the sample of firms having employees abroad may be considerably different from the sample of firms working only domestically. A priori existing drastic differences in the samples raise a number of concerns about endogeneity issues resulting from selection and self-selection. In particular, if (in particular omitted) variables drive both selection into internationalization and innovation, a positive correlation between the two variables may be spurious. One way to deal with the heterogeneity resulting is to applied pre-regression matching procedures to homogenize the samples. If the included and the omitted variables are sufficiently correlated, pre-regression matching can be expected to eliminate or at least reduce estimation biases. A particularly convenient approach to achieve balanced estimation samples is entropy balancing, which estimates the treatment probability (in this case the probability of having foreign employees in the first step). It then runs the main regressions of interest with weighted observations, where weights are chosen such that the moments of distribution (typically mean, variance, kurtosis) are as similar across treatment and control groups. In Table 4 and Table 5, we present the results of

the entropy balancing approach and find that the results do not appear to be strongly affected, with baseline, squared and interaction effects being largely unchanged.[2]

Table 4: The innovation effects of foreign locations (product innovators, baseline, entropy balancing)

	(1)	(2)	(3)	(4)
Share employees foreign locations	0.0036***	0.0033***	0.0110***	0.0121***
	(8.22)	(8.35)	(8.52)	(8.35)
Employees	0.0001**	0.0000**	0.0000***	0.0001***
	(3.21)	(3.22)	(3.31)	(3.30)
R&D intensity	0.0000	0.0000	0.0000	0.0000
	(0.73)	(0.62)	(0.76)	(0.65)
Labor productivity	-0.0000	-0.0000	-0.0000	-0.0000
	(-0.51)	(-0.94)	(-0.68)	(-1.11)
Capital intensity	-0.0231	-0.0213	-0.0193	-0.0214
	(-1.05)	(-1.05)	(-1.00)	(-1.00)
Square: Share employees foreign locations			-0.0001***	-0.0001***
			(-6.30)	(-6.22)
Year dummies	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes
Mundlak FE-correction	No	Yes	No	Yes
Observations	9104	9104	9104	9104
Pseudo R^2				

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: The innovation effects of foreign locations (product innovators, interaction w. national diversity, entropy balancing)

	(1)	(2)	(3)	(4)
Share employees foreign locations	0.0025***	0.0025***	0.0110***	0.0110***
	(4.60)	(4.60)	(7.42)	(7.41)
(Share employees foreign locations)*(Nationa	0.0068**	0.0068**	0.0069***	0.0070***

[2] It is worth noting that the balancing algorith converged properly, implying that the remaining differences between the sample were virtually non-existent. A copy of the table evidencing the balancing is available from the author upon request.

l diversity)				
	(3.15)	(3.16)	(3.37)	(3.38)
National diversity	-0.1220	-0.1250	-0.1339	-0.1371
	(-1.58)	(-1.62)	(-1.76)	(-1.80)
Employees	0.0000**	0.0000**	0.0000**	0.0001**
	(3.19)	(3.19)	(3.28)	(3.29)
R&D intensity	0.0000	0.0000	0.0000	0.0000
	(0.73)	(0.62)	(0.76)	(0.65)
Labor productivity	-0.0000	-0.0000	-0.0000	-0.0000
	(-0.48)	(-0.89)	(-0.65)	(-1.06)
Capital intensity	-0.0212	-0.0215	-0.0193	-0.0196
	(-0.98)	(-0.98)	(-0.93)	(-0.93)
Square: Share employees foreign locations			-0.0001***	-0.0001***
			(-6.22)	(-6.22)
Year dummies	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes
Mundlak FE-correction	No	Yes	No	Yes
Observations	9104	9104	9104	9104
Pseudo R^2				

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

To probe the question of causality further, we have exploited the panel data structure to account for potential time lags between the share of foreign-based employees and innovation by including a one-year time lag. For the sake of brevity, we do not report the original table. This is however available upon request and does not show any relevant differences in the results.

Moreover, we analyzed whether the results hold for different indicators of innovativeness. So far all regressions analyzed the effects on the probability to introduce product innovations. A common alternative indicator provided by the CIS is the share of sales due to new or improved products (see Belderbos et al. 2020). This measure may not be as neatly interpretable as the product innovator dummy but it has the advantage of being continuous. Using Tobit-regressions, we reestimated all models using the share of turnover with new products. We did not observe any differences in the results in terms of direction and significance of the coefficients.

A final check concerns the question of whether the results applied to all types of firms and all sectors alike. In Table 2 and Table 3 we have included firms from all sectors with paying attention to potential differences. In Table 5 and Table 6 we test whether the baseline results differ between services and manufacturing firms. While results may also differ between more fine-grained sector differentiations, the difference between services and manufacturing may be particularly relevant

because both innovation strategies (because of the intangibility of the offer) and the internationalization strategies (because of reduced tradability) will differ between firms. As one can see from the results, the size of the linear and squared coefficients are differ indeed to some degree, with service firms benefitting on average less from internationalization (Coloumns 1 and 2 in Table 5 and Table 6). However, ones squared terms are included, the inverted u-shape relationship remains intact also for services.

Table 6: The innovation effects of foreign locations (product innovators, baseline, manufacturing)

	(1)	(2)	(3)	(4)
Share employees foreign locations	0.0042***	0.0038***	0.0099***	0.0114***
	(8.85)	(9.14)	(8.01)	(7.95)
Employees	0.0001***	0.0001***	0.0001***	0.0001***
	(3.86)	(3.82)	(3.92)	(3.82)
R&D intensity	0.0029	0.1709*	0.0025	0.1968*
	(0.55)	(2.04)	(0.54)	(2.06)
Labor productivity	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.39)	(-1.03)	(-1.60)	(-1.14)
Capital intensity	-0.0015	-0.0001	-0.0013	-0.0001
	(-0.61)	(-0.08)	(-0.60)	(-0.05)
Square: Share employees foreign locations			-0.0001***	-0.0001***
			(-5.19)	(-5.22)
Year dummies	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes
Mundlak FE-correction	No	Yes	No	Yes
Observations	6398	6398	6398	6398
Pseudo R^2				

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: The innovation effects of foreign locations (product innovators, baseline, services)

	(1)	(2)	(3)	(4)
Share employees foreign locations	0.0007	0.0007	0.0241***	0.0247***
	(0.87)	(0.88)	(5.62)	(5.55)
Employees	0.0000	0.0000	0.0000	0.0000

	(0.21)	(0.14)	(0.81)	(0.71)
R&D intensity	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-9.26)	(-9.30)	(-8.65)	(-8.74)
Labor productivity	-0.0000	-0.0000	-0.0000	-0.0000*
	(-1.73)	(-1.84)	(-1.94)	(-1.96)
Capital intensity	-0.0775*	-0.0776*	-0.0519	-0.0546
	(-2.11)	(-2.11)	(-1.58)	(-1.60)
Square: Share employees foreign locations			-0.0004***	-0.0004***
			(-5.57)	(-5.50)
Year dummies	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes
Mundlak FE-correction	No	Yes	No	Yes
Observations	2707	2707	2707	2707
Pseudo R^2				

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5 Discussion and Conclusion

We provided empirical evidence that the increasing integration in global value chains (Kano et al. 2020) can carry important benefits to the firms not only in terms of cost-reductions or increased productivity but also in terms of innovativeness of the home base operations.

This finding has conceptual bearings for a number of streams in IB. On the one hand, our results are in line with arguments from a literature analyzing the motives for internationalization, which argues that one important reason for being active internationally is tapping into globally dispersed knowledge sources (Cuervo-Cazzura et al. 2015, Meyer 2015, Hervas-Oliver and Albors-Garrigos 2008, Scott-Kennel and Saittakari 2020). The results are also consistent with views stressing that MNEs act as global disseminators and hubs of knowledge (Kogut and Zander 2003, Mudambi and Swift 2012).

At the same time, our results were indicative of important sources of costs associated with internationalization for innovation. One stream of the literature has focused on costs resulting from managerial complexity associated with internationalization (Baier et al. 2015, Fifarek et al. 2008), which could endanger to ability to innovate successfully. Alternativetly, Ceci and Prencipe (2013) have warned that internationalization may exacerbate all sorts of principal agent problems that result from the reduced effectiveness of monitoring. Although, we are unable to identify the sources of the costs that are implied by excessive internationalization (Belderbos et al. 2020, Baier et al. 2015), we are able to document that they exist and thereby provide further evidence that they should be a primary concern for firms considering internationalization. Moreover, because we do not focus on the offshoring of innovation activities on innovation but on the offshoring of general activities on innovation, it may also stand to reason that the costs in terms of reduced innovation activities may not have been anticipated. One the mechanisms that may drive such unanticipated costs is that internationalization may unintendedly reduce the embeddedness in innovation networks at the home base (Baier et al. 2015). That heeds the call that firms need to consider side effects on innovative capacity even when the internationalized activities appears to be not directly related to innovation. As pointed out by Schubert and Tavassoli (2020) innovation is process that spans multiple firm functions and changes function in functions such as sales or marketing may have implications for innovative capacity in general.

A final contribution of our research appeals to role of diversity. In particular, the informational diversity view suggests that diversity should have a positive direct effect on innovation because it increases the recombination potential (Østergaard et al. 2011, Harrison and Klein 2007). While the diversity literature has managed to provide evidence of some stable relationships, the simultaneous existence of costs of diversity associated with processes of social categorization (Faems & Subramanian, 2013; Roberge & van Dick, 2010; van Knippenberg, De Dreu, & Homan, 2004; Williams & O'Reilley, 1998) has led to a stream of research, which was not able to provide

uncontested evidence of uniformly positive effects. Instead the costs and benefits of diversity appear to depend strongly whether diversity task-related or not (van Knippenberg et al. 2004, Williams and O'Reilley, 1998), which dimensions of diversity are considered (Østergaard et al. 2011, Dahlin et al. 2005, Talke et al. 2011) and what hierarchical level of the focal teams have (Schubert and Tavassoli 2020). Our results suggest a different viewpoint: in particular, our results provide no evidence of any direct effects of (national) diversity because the linear term is insignificant in all models. However, diversity may function as a moderating resource that moderates the trade-off between benefits and costs of internationalization. That is astonishing: since most authors would have argued that national diversity is probably a task-unrelated dimension of diversity and therefore may rather cause processes of social categorization than increase informational variety (van Knippenberg et al. 2004; Williams and O'Reilley, 1998), in an international context national diversity may become an important resource that helps firms to reap the benefits from internationalization while keeping costs under control. If the view that diversity can be considered to be a resource which is particularly valuable in international contexts, it would solve the conundrum pointed out by Schubert and Tavassoli (2020) that many multinational firms consider diversity to be of primary importance, while literature does not find stable results. The solution may be that that diversity may be specifically important in a multinational context while many empirical analyzed ignored the international dimension.

Our study has a number of limitations, which point potential avenues for future research. First, our dataset, although particularly rich in terms of the demographic characteristics of firms and employees, does not allow us to identify in detail the managerial and organizational processes driving our effects. One implication is that we are only able to infer to the benefits and costs of diversity on the one hand and internationalization on the other. We are unable to analyze for example team-level processes related to trust, communication, collaboration or strategy, which are known to important ingredients into the diversity-internationalization nexus (Smith & Tushman, 2005, Eesley et al, 2014, Schubert et al. 2018). Our solution to that issue was arguably technical in nature, in that we control for unobserved heterogeneity by econometric means. While we are optimistic that our approach leads us to robust and consistent results, it nonetheless does not allow us to analyze the firm and team level organizational processes in the detail that would do justice to their relevance.

A second limitation pertaining to our data is the absence of information on what types of activities the Swedish MNEs in our samples internationalized. All we know is the share of employees located abroad. That does not invalidate our results. However, it again prevents us from analyzing in greater detail, whether the results differ by the type activities performed abroad. We are therefore for example unable to analyze inasmuch as the e.g. the internationalization of R&D is more or less beneficial than the internationalization of IT services.

6 References

Baier, E., Rammer, C., & Schubert, T. (2015). The impact of captive innovation offshoring on the effectiveness of organizational adaptation. Journal of International Management, 21(2), 150-165.

Belderbos, R. (2001). Overseas innovations by Japanese firms: an analysis of patent and subsidiary data. *Research Policy*, *30*(2), 313-332.

Belderbos, R., Carree, M., Lokshin, B., & Sastre, J. F. (2015). Inter-temporal patterns of R&D collaboration and innovative performance. *The Journal of Technology Transfer*, *40*(1), 123-137.

Belderbos, R., Jacob, J., & Lokshin, B. (2018). Corporate venture capital (CVC) investments and technological performance: Geographic diversity and the interplay with technology alliances. *Journal of Business Venturing*, *33*(1), 20-34.

Belderbos, R., Lokshin, B., Boone, C., & Jacob, J. (2020). Top management team international diversity and the performance of international R&D. *Global Strategy Journal*.

Berry, H. (2014). Global integration and innovation: multicountry knowledge generation within MNC s. *Strategic Management Journal*, *35*(6), 869-890.

Black, J. S., Mendenhall, M., & Oddou, G. (1991). Toward a comprehensive model of international adjustment: An integration of multiple theoretical perspectives. *Academy of management review*, *16*(2), 291-317.

Castellani, D., Montresor, S., Schubert, T., & Vezzani, A. (2017). Multinationality, R&D and productivity: Evidence from the top R&D investors worldwide. *International Business Review*, *26*(3), 405-416.

Castellani, D., Piva, M., Schubert, T., & Vivarelli, M. (2019). R&D and Productivity in the US and the EU: Sectoral Specificities and Differences in the Crisis. *Technological Forecasting and Social Change*, *138*, 279-291.

Castellani, D., & Zanfei, A. (2006). *Multinational firms, innovation and productivity*. Edward Elgar Publishing.

Ceci, F., & Prencipe, A. (2013). Does distance hinder coordination? Identifying and bridging boundaries of offshored work. Journal of International Management, 19(4), 324-332.

Cornelißen, T., & Sonderhof, K. (2008). Marginal effects in the probit model with a triple dummy variable interaction term (No. 386). Diskussionsbeitrag.

Cuervo-Cazurra, A., Narula, R., & Un, C. A. 2015. Internationalization motives: Sell more, buy better, upgrade and escape. The Multinational Business Review, 23(1): 25–35.

Dahlin, K. B., Weingart, L. R., & Hinds, P. J. (2005). Team diversity and information use. Academy of management journal, 48(6), 1107-1123.

D'Attoma, I., & Pacei, S. (2014). Offshoring and firm performance: evidence from the Italian manufacturing industry. *Review of Development Economics*, *18*(1), 29-44.

Doh, J. P., Bunyaratavej, K., & Hahn, E. D. (2009). Separable but not equal: The location determinants of discrete services offshoring activities. Journal of International Business Studies, 40(6), 926-943.

Dunning, J. H. (1993). Internationalizing Porter's diamond. MIR: Management International Review, 7-15.

Eesley, C. E., Hsu, D. H., & Roberts, E. B. 2014. The contingent effects of top management teams on venture performance: aligning founding team composition with innovation strategy and commercialization environment. Strategic Management Journal, 35: 1798-1817.

Faems, D., & Subramanian, A. M. 2013. R&D manpower and technological performance: the impact of demographic and task-related diversity. Research Policy, 42: 1624-1633.

Fifarek, V., Veloso, F.M., Davidson, C.I., 2008. Offshoring technology innovation: a case study of rare-earth technology. J. Oper. Manag. 26, 222–238.

Griffith, R., Harrison, R., & Van Reenen, J. (2006). How special is the special relationship? Using the impact of US R&D spillovers on UK firms as a test of technology sourcing. American Economic Review, 96(5), 1859-1875.

Grossman, G. M., & Helpman, E. (2005). Outsourcing in a global economy. The Review of Economic Studies, 72(1), 135-159.

Harrison, D. A., & Klein, K. J. (2007). What's the difference? Diversity constructs as separation, variety, or disparity in organizations. Academy of management review, 32(4), 1199-1228.

Hervas-Oliver, J. L., & Albors-Garrigos, J. (2008). Local knowledge domains and the role of MNE affiliates in bridging and complementing a cluster's knowledge. Entrepreneurship and regional development, 20(6), 581-598.

Kafouros, M. I., Buckley, P. J., Sharp, J. A., & Wang, C. (2008). The role of internationalization in explaining innovation performance. Technovation, 28(1-2), 63-74.

Kano, L., Tsang, E. W., & Yeung, H. W. C. (2020). Global value chains: A review of the multi-disciplinary literature. Journal of International Business Studies, 1-46.

Kedia, B. L., & Mukherjee, D. (2009). Understanding offshoring: A research framework based on disintegration, location and externalization advantages. Journal of World Business, 44(3), 250-261.

Kleinknecht, A., Van Montfort, K., & Brouwer, E. (2002). The non-trivial choice between innovation indicators. Economics of Innovation and new technology, 11(2), 109-121.

Kogut, B., & Zander, U. (2003). Knowledge of the firm and the evolutionary theory of the multinational corporation. Journal of international business studies, 34(6), 516-529.

Kotabe, M., Parente, R., Murray, J.Y., 2007. Antecedents and outcomes of modular production in the Brazilian automobile industry: a grounded theory approach. J. Int. Bus. Stud. 38, 84–106.

Lahiri, N. (2010). Geographic distribution of R&D activity: how does it affect innovation quality?. Academy of Management Journal, 53(5), 1194-1209.

Levitt, T. (1993). The globalization of markets. Readings in international business: a decision approach, 249, 249-252.

Li, J. J., Zhou, K. Z., Lam, S. S., & David, K. T. (2006). Active trust development of local senior managers in international subsidiaries. Journal of Business Research, 59(1), 73-80.

Lisak, A., Erez, M., Sui, Y., & Lee, C. (2016). The positive role of global leaders in enhancing multicultural team innovation. Journal of International Business Studies, 47(6), 655-673.

Meyer, K. E. 2015. What is ‘‘strategic asset seeking FDI’’?. The Multinational Business Review, 23(1): 57–66.

Meyer, K. E., Wright, M., & Pruthi, S. 2009. Managing knowledge in foreign entry strategies: A resource-based analysis. Strategic Management Journal, 30(5): 557–574.

Mihalache, O. R., Jansen, J. J., Van Den Bosch, F. A., & Volberda, H. W. (2012). Offshoring and firm innovation: The moderating role of top management team attributes. Strategic Management Journal, 33(13), 1480-1498.

Mudambi, R. (2008). Location, control and innovation in knowledge-intensive industries. Journal of economic Geography, 8(5), 699-725.

Mudambi, R., & Swift, T. (2012). Multinational enterprises and the geographical clustering of innovation. Industry and Innovation, 19(1), 1-21.

Nieto, M. J., & Rodríguez, A., 2011. Offshoring of R&D: Looking abroad to improve innovation performance. Journal of International Business Studies, 42(3): 345–361.

Nieto, M.J., Rodríguez, A., 2013. The challenge of R&D offshoring: implications for firm productivity. In: Bals, L., Ørberg Jensen, P.D., Larsen, M. (Eds.), The Offshoring Challenge. Springer, Heidelberg et al., pp. 175–190.

OECD. (2005). OSLO-Manual: The measurement of scientific and technological activities. Proposed Guidelines for Collecting an Interpreting Technological Innovation Data, 30.

Østergaard, C. R., Timmermans, B., & Kristinsson, K. (2011). Does a different view create something new? The effect of employee diversity on innovation. Research Policy, 40(3), 500-509.

Phene, A., & Almeida, P. (2008). Innovation in multinational subsidiaries: The role of knowledge assimilation and subsidiary capabilities. Journal of international business studies, 39(5), 901-919.

Rodríguez, A., & Nieto, M. J. (2016). Does R&D offshoring lead to SME growth? D ifferent governance modes and the mediating role of innovation. Strategic management journal, 37(8), 1734-1753.

Rosenbusch, N., Gusenbauer, M., Hatak, I., Fink, M., & Meyer, K. E. (2019). Innovation offshoring, institutional context and innovation performance: A meta-analysis. Journal of management studies, 56(1), 203-233.

Schubert, T., Baier, E., & Rammer, C. (2018). Firm capabilities, technological dynamism and the internationalisation of innovation: A behavioural approach. Journal of International Business Studies, 49(1), 70-95.

Schubert, T., & Tavassoli, S. (2020). Product innovation and educational diversity in top and middle management teams. Academy of Management Journal, 63(1), 272-294.

Schwörer, T. (2013). Offshoring, domestic outsourcing and productivity: evidence for a number of European countries. Review of World Economics, 149(1), 131-149.

Scott-Kennel, J., & Saittakari, I. (2020). Sourcing or sharing in MNE networks? National headquarters and foreign subsidiaries as knowledge conduits in SMOPECs. International Business Review, 29(1), 101622.

Shimizutani, S., & Todo, Y. (2008). What determines overseas R&D activities? The case of Japanese multinational firms. Research Policy, 37(3), 530-544.

Simon, H. A. (1991). The architecture of complexity. In Facets of systems science (pp. 457-476). Springer, Boston, MA.

Simon, H. A. (2002). Near decomposability and the speed of evolution. Industrial and corporate change, 11(3), 587-599.

Smith, W. K. & Tushman, M. L. 2005. Managing strategic contradictions: a top management model for managing innovation streams. Organization Science, 16: 522-536.

Song, J., & Shin, J. (2008). The paradox of technological capabilities: A study of knowledge sourcing from host countries of overseas R&D operations. Journal of International Business Studies, 39(2), 291-303.

Steinberg, P. J., Procher, V. D., & Urbig, D. (2017). Too much or too little of R&D offshoring: The impact of captive offshoring and contract offshoring on innovation performance. Research Policy, 46(10), 1810-1823.

Subramaniam, M., & Venkatraman, N. (2001). Determinants of transnational new product development capability: Testing the influence of transferring and deploying tacit overseas knowledge. Strategic management journal, 22(4), 359-378.

Talke, K., Salomo, S., & Kock, A. 2011. Top management team diversity and strategic innovation orientation: the relationship and consequences for innovativeness and performance. Journal of Product Innovation Management, 28: 819-832.

Tang, J., Livramento, H., 2010. Offshoring and productivity: a micro-data analysis. Rev. Income Wealth 56, 111–134.

Van Knippenberg, D., De Dreu, C. K., & Homan, A. C. 2004. Work group diversity and group performance: an integrative model and research agenda. Journal of Applied Psychology, 89: 1008-1022.

Wertheimer, M. (1923). Untersuchungen zur Lehre von der Gestalt. II. Psychologische forschung, 4(1), 301-350.

Williams, K. Y., & O'Reilly, C. A. 1998. Demography and diversity in organizations: a review of 40 years of research, In B.M. Staw, & L.L. Cummings (Eds.), Research in Organizational Behavior, vol. 20: 77–140. Greenwich, CT: JAI Press.

Wooldridge, Jeffrey M. "Simple solutions to the initial conditions problem in dynamic, nonlinear panel data models with unobserved heterogeneity." Journal of applied econometrics 20.1 (2005): 39-54.