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Giebel, Marek

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Is More Always Better? External Consultants and Firm Innovation in Emerging Markets

Marek Giebel*

Copenhagen Business School

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Abstract

I analyze the relationship between hiring external consultants and firm innovation in emerging markets. Firms in these economic environments face specific problems that hinder organizational activities such as innovation. Hiring external consultants is considered a particularly important strategy to overcome these corporate inefficiencies as it provides firms with access to skills and knowledge. The results for a sample of firms from 32 countries imply that firms that hire external consultants are more likely to conduct product and process innovation. Moreover, the use of advisory services is positively associated with the likelihood of undertaking more ambitious innovation projects in terms of disruptiveness and the number of innovation types. Determining the impact of the consulting intensity, I show that the relation between the number of interactions with external consultants and innovation is inversely U-shaped. This implies that more consulting is not always better.

Keywords: Innovation activity, external consultants, business advice, innovation capability, knowledge and skills, emerging markets

JEL classification: L20, L21, O14, O25, O30, O31, O32

* Copenhagen Business School, Department of Economics, Porcelænshaven 16A, DK-2000 Frederiksberg, Email: mg.eco@cbs.dk

1 Introduction

Emerging markets are a remarkable economic force, consisting of fast-growing countries that are rapidly integrating into global markets (Hoskisson et al. 2000; Wright et al. 2005; Kose & Prasad 2010; Fu et al. 2011; Cavusgil 2021; OECD 2021). Although this is the case, it is generally acknowledged that firms in these markets face particular problems which hamper organizational activities like innovation (e.g., Besley & Chase 1993; Fu et al. 2011; Hoskisson et al. 2000; Zanello et al. 2016; Anand et al. 2021; Cavusgil 2021). This is particularly problematic from a welfare perspective as there are clear social and private returns from technological advancements (e.g., Schumpeter 1942; Rubera & Kirca 2012). Thus, fostering firm innovation in emerging markets has been discussed for some time and is part of a variety of policy initiatives (Wright et al. 2005; Sachs et al. 2019; Ruch 2020; OECD 2021), so that these countries reach the technological frontier and catch up economically (Besley & Case 1993; Fu et al. 2011; Kotabe et al. 2017; Anand et al. 2021).

Although a wide array of literature investigates within-country or cross-border factors affecting corporate innovation in emerging economies (e.g., Zanello et al. 2016), surprisingly, little evidence exists on the direct external influences like seeking business advice. It is generally acknowledged that business consulting services provide firms with, for example, access to skills and knowledge to improve firm operations (e.g., Cumming & Fischer 2012; Bianchi et al. 2016; Cerruti et al. 2019), which is significant for businesses operating in this environment (e.g., Fu et al. 2011). Besides this general influence, seeking business advice also allows firms to mitigate obstacles to innovation, like limitations in access to external knowledge or the ability to master the innovation process (e.g., Tether & Tajar 2008; Cumming & Fischer 2012; D'Antone & Santos 2016). Consequently, I analyze whether hiring external consultants affects the innovation behavior of firms in emerging markets. However, consulting services are costly, and there might be limits to the absorption and provision of new knowledge

and skills. Thus, I also determine the relationship between the number of consultant-firm interactions and innovation output.

I utilize firm-level data from the Business Environment and Enterprise Performance Survey (BEEPS) that comprises firms from 32 Eastern Europe and Central Asia countries. Combining logit regressions to determine the probability of hiring external consultants on innovation output with a matching approach allows me to consider the selectivity of using external consulting services. My results imply that hiring external consultants is associated with a higher probability of performing a product or process innovation. I extend these findings by showing that the impact of the number of consultancy visits on innovation has the shape of an inverted U. While the probability of performing innovation is the highest at the tipping point of the inverted U, the first consultant visit provides the most significant benefit. Consequently, these findings could be summarized as follows: More is not always better. Further results imply that firms that hire external consultants perform more ambitious innovation regarding disruptiveness and the number of innovation types.

I contribute novel evidence to literature, which highlights the importance of technical change to catch up technologically and hampering factors for innovation in emerging markets (e.g., Almeida & Fernandes 2008; Gorodnichenko et al. 2010; Ayyagari et al. 2011; Fu et al. 2011; Gorodnichenko & Schnitzer 2013; Mateut 2018; Krammer 2019; Torres de Oliveira et al. 2022). While these studies focus on the impact of determinants like intellectual property rights (e.g., Gentile 2020), financing (e.g., Gorodnichenko & Schnitzer 2013; Mateut 2018), or competition (e.g., Ayyagari et al. 2011), I shed more light on factors outside of the firm, namely external consultants. My results imply that hiring external consultants is a particularly important tool for sourcing knowledge and skills. Consequently, my analysis underlines the importance of providing advisory services for firms in emerging markets to catch up

technologically. Moreover, I extend this literature further by showing the details and limitations (i.e., diminishing returns) of this means affecting innovations.

More specifically, the results in this paper contribute to the literature analyzing the impact of external consultants on firm outcomes. First, I particularly complement studies examining this relationship in developing countries (e.g., Bloom et al. 2013; Back et al. 2014; Bruhn et al. 2018; Bloom et al. 2019; Chatterji et al. 2019; Iacovone et al. 2022). Thereby, I provide novel evidence to works analyzing the impact of consulting on firm outcomes like employment (e.g., Bruhn et al. 2018) or productivity (e.g., Bloom et al. 2013) by adding results for the relationship between firms, external consultants, and innovation output. I also extend Back et al. (2014) by using a large sample of firms from Eastern Europe and Central Asia and providing novel evidence that external consultants positively affect innovation output, which diminishes with the consulting intensity. For similar reasons, second, the findings for emerging markets in this study add to strands of literature that analyze (i) the impact of external sources, like consultants, on innovation in developed countries (e.g., Arora & Gambardella 1994; Cassiman & Veugelers 2006; Laursen & Salter 2006; West & Bogers 2014; West et al. 2014; Salter et al. 2015; Bianchi et al. 2016; Ebersberger et al. 2021), and (ii) the effect of knowledge-intensive business services on innovation (e.g., Hertog 2000; Muller & Zenker 2001; Bettencourt et al. 2002; Muller & Doloreux 2009; Mas-Verdú et al. 2011).

2 Hiring external consultants and firm innovation

It is generally acknowledged that innovations are important for economic development and growth, particularly for developing countries (e.g., Anand et al. 2021; Fu et al. 2011). However, the institutional environment of emerging markets could be characterized by corruption (e.g., Krammer 2019), a lack of adequate infrastructure (e.g., Fu et al. 2011), low market integration (e.g., Gorodnichenko et al. 2010), a diminished level of economic

development (e.g., Fagerberg et al. 2010), and weak intellectual property right systems (e.g., Chen & Puttitanun 2005). These factors and characteristics, such as significant uncertainties, risks, and costs, make the adoption and diffusion of innovation difficult (e.g., Zanello et al. 2016). Consequently, firms operating in emerging markets face a particular institutional environment that constitutes an obstacle to innovation activities.

Since innovations are essential for economic development and growth, it is particularly important to overcome hampering factors that prevent their adoption and diffusion. The specific focus of this paper in that context is on external consultants and their impact on firm innovation. Consulting services provide firms with access to skills and knowledge to improve firm operations (e.g., Cumming & Fischer 2012). In that regard, numerous studies have shown that firm performance, in general, is affected positively by externally exerted management improvements (e.g., Bloom et al. 2013; Bruhn et al. 2018). Moreover, seeking business advice allows for overcoming general business and operational problems that likely hamper firm innovation behavior (e.g., Tether & Tajar 2008; D'Antone & Santos 2016). Mitigating existing resource-consuming operational problems enables the redistribution of physical and intellectual resources to innovation. Thus, hiring external consultants affects business operations positively by improving the firm's use of its resource base.

Besides more efficient use of internal resources, hiring external consultants improves the firm's ability to access and combine resources to build new routines for innovation (e.g., Cumming & Fischer 2012). Thus, accessing resources for innovation from outside the firm is likely improved by the trust and credibility of external consultants and their repeated interactions with potential business partners (e.g., Bianchi et al. 2016). Additionally, the advice of the consultants allows firms to build new routines, which include, for example, the combination of firm and external resources for innovation. Sources from outside the firm, like

external consultants, also enable firms to access and appropriate external knowledge, which is an essential input for innovations (Audretsch & Feldman 1996; Laursen & Salter 2006; Almeida and Fernandes 2008; Lichtenthaler & Lichtenthaler 2009; West & Bogers 2014; Audretsch & Belitski 2020; Bianchi et al. 2016). In that respect, hiring external consultants allows firms to access a network of valuable partners and knowledge sources for innovation activities (Bianchi et al. 2016). Additionally, external advisors aid firms in the case of fraudulent behavior of the contracting parties, for example, when transferring knowledge (Bianchi et al. 2016). This ensures that contracts are honored and potential knowledge transfer problems are mitigated. Thus, using this means allows firms to access and appropriate external knowledge (e.g., Tether & Tajar 2008; West & Bogers 2014). Consequently, hiring external consultants fosters firm innovation, which leads to the following hypothesis:

H1: Firms which hire external consultants are more likely to carry out innovations.

The previous paragraphs highlight the advantages when hiring external consultants concerning innovation outcomes. However, it has to be noted that the additional contribution of performance improvements is likely decreasing in the degree of its use (Deeds & Hill 1996). This holds not only for firm performance in general (e.g., Chrisman et al. 2005) but also for the effect of external knowledge on firm innovation (e.g., Laursen & Salter 2006; Grimpe & Kaiser 2010; Bianchi et al. 2016). Thus, the assumption of a non-linear relationship between consulting interactions and innovation is grounded in various problems regarding the knowledge transfer between the consultant and the firm. First, external consultants likely have limits in their ability and knowledge (e.g., Chrisman et al. 2005). These limitations lead to a decrease in the returns of each additional interaction. In addition, second, the ability of the firm to absorb the knowledge provided by external consultants might also be limited (e.g., Chrisman et al. 2005). This might make additional consulting visits less valuable due to low or missing

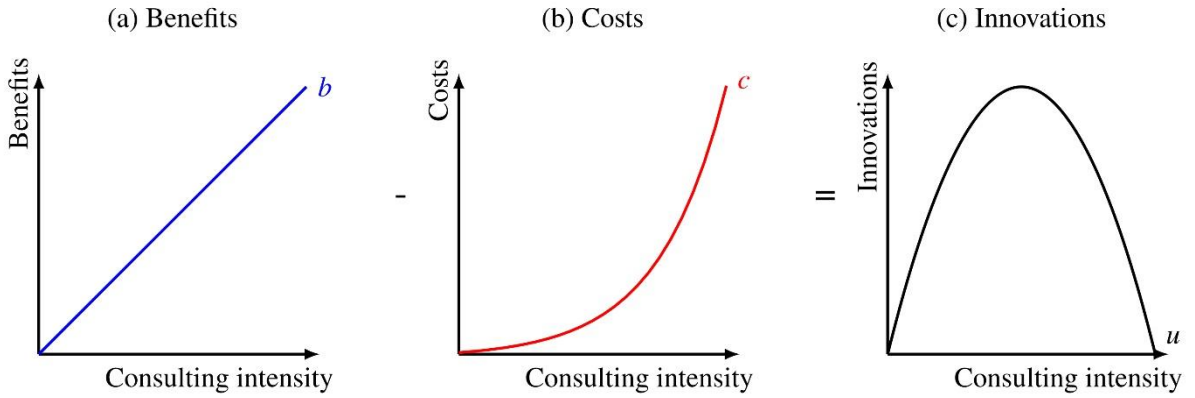
appropriation of additional knowledge. Besides knowledge, financial factors have to be considered concerning the returns of consultancy usage. This includes search costs to find an appropriate consulting service, as the quality of expert services is difficult to assess ex-ante and ex-post (e.g., Dulleck & Kerschbamer 2006). Additionally, after finding a suitable business advisory service, monetary expenses must be spent on a consultancy visit. This implies that after a critical number of visits, the costs of an additional interaction outweigh its benefits. Thus, it is expected that the returns of each additional consulting visit might not contribute equally (linearly) to the probability of performing an innovation. Consequently, the effect of the intensity of consulting on innovation is expected to have the shape of an inverted U. These considerations lead to the following hypothesis:

H2: The relationship between the number of consultancy visits and the probability of performing an innovation is an inverted U.

The above-described relationship is visually depicted in Figure 1, following the framework proposed by Haans et al. (2016). Panel (a) of Figure 1 shows a positive relationship between the usage of consultants and firm innovation, denoted as benefits, which is consistent with H1. This originates, among others, in the role of consultants in providing firms access to new skills and knowledge, helping them overcome operational problems, improving the resource allocation within the firm, but also assisting businesses in accessing and appropriating external knowledge. As noted in the description of the relationship between consultants and firm performance above, it could be expected that hiring advisory services is connected with costs. This relationship is depicted in panel (b) of Figure 1. The curvature relates to the facts presented above that the costs are moderate for the initial levels of consulting but increase sharply with a higher intensity. This results, among others, from the expenses for the services themselves, increasing problems providing new knowledge and skills, but also the diminished appropriation of these from the receiver perspective. The relationship between hiring

consultants and innovation can be summarized by the difference between benefits (panel a) and costs (panel b) which is depicted in the last panel (c) of Figure 1. This shows the expected inverted U relationship between consulting intensity and innovation propensity, as hypothesized in H2.

Figure 1: The relationship between hiring external consultants and innovation



Notes: The figure shows the relationship between consulting intensity and innovations in the context of the nonlinear relationship framework developed by Haans et al. (2016).

3 Data and empirical strategy

3.1 Data

I use data from the fifth round of the Business Environment and Enterprise Performance Survey (BEEPS), covering 32 countries from Eastern Europe and Central Asia. More specifically, I utilize the 2017 version of the BEEPS V and MENA Enterprise Survey provided by the European Bank for Reconstruction and Development (BERD) completed from 2012 to 2016. This is in line with other works (e.g., Gorodnichenko et al. 2010; Ayyagari et al. 2011; Gorodnichenko & Schnitzer 2013; McCann & Bahl 2017; Mateut 2018; Krammer 2019; Cirera & Muzi 2020) that use World Bank Enterprise Survey data set to investigate the determinants of innovation in emerging markets. The surveyed firms stem from the non-agricultural private sector, such that the sampling industries of interest are manufacturing and service (International Standard Industrial Classification (ISIC) codes 15-37, 45, 50-52, 55, 60-64, and 72). In these sectors, small, medium, and large-sized firms from the regions of major economic

activity of a country are sampled. Based on the intention of the survey to analyze the business environment and performance, the firms included in the BEEPS have at least five employees and are neither owned by the government nor the state. Table A1 in Appendix A shows an overview of the countries and the number of firms within each country. Moreover, Table A2 in Appendix A shows the industries the firms are related to. The final sample for my analysis consists of cross-sectional data covering 12,145 small and medium-sized firms from 32 countries for the years 2011 to 2014 and 2016.

3.2 Variables

I use a rich set of variables to determine the relationship between the use of consultancy services and firm innovation outcomes in emerging markets, as described in Section 2. The first indicator, 'Consultants', takes unit value if the firm hired any external consultant in the last three years and zero if not. The variable is used to analyze if firms that hire external consultants differ in their innovation outcome (H1). I complement the above-described information with variables capturing the intensity of consulting. Therefore, I utilize the measure 'Number of consultancy visits', which informs about the number of consultancy visits each firm received. To account for a possible bias due to outlier values, the variable is winsorized at the 99th percentile. Utilizing this measure and its square allows me to analyze whether an additional consultant visit leads to increased returns or whether returns might also diminish after a tipping point (H2).

Furthermore, I use measures for innovation output to determine the impact of hiring consultants on innovation. First, firms were asked whether they had introduced a new production method or a new service. Second, a question was asked whether the firms introduced a new method of production or supply. I create two dummy variables ('Product innovation', 'Process innovation') which take a unit value if the firms answered the respective

question in the affirmative and zero if not. The correlations between the innovation measures are shown in Table A3. Next, to test for the innovation ambitions of the focal firm, I follow the literature that considers innovation ambitions in terms of disruptiveness and types (e.g., Tang 2006; Vega-Jurado et al. 2008; Karlsson & Tavassoli 2016; Rodriguez et al. 2017; Hsieh et al. 2018; Abbas et al. 2022) and add two further variables. Thus, I first extend the definition of product innovation by considering whether the innovation is new to the firm or the market. Therefore, I create the categorical variable, 'Product innovation type', that takes value zero when the firm has not pursued product innovation. Values one or two are assigned for firms that performed product innovation new to the firm (value one) or new to the market (value two). I second construct the categorical variable 'Innovation type combination'. This takes value zero for non-innovators and values one or two for firms that carried out only a product (value one) or process innovation (value two). For those firms that performed both innovation types, value three is assigned. Thus, these variables allow me to test whether firms hiring external consultants perform more ambitious innovation projects measured as disruptive innovations (i.e., new to the market) or that involve multiple innovation types.

In addition to consulting characteristics or innovation output, I apply a rich set of firm control variables. For this purpose, I use the logarithm of the firm's employees three years ago 'Logarithm of employees' to control for the firm's size. In addition, I account for the firm's age by applying the logarithm of age 'Logarithm of age' as an additional explanatory variable. Next, the set of control variables is extended by indicator variables covering information on the group membership 'Part of a firm group' of the firm, and whether the firm is located in the country's capital city 'Capital city'. I also control for potential sources of knowledge, innovation, and the firm's absorptive capacity by including a dummy variable 'R&D active' which takes unit value if the firm performs R&D and zero if not. Following the literature (e.g., Camisón et al. 2014; Wang & Chen 2020), I add two variables to account for the changes in

the focal firm's strategy and organizational adjustments. The first variable 'Management innovation' takes unit value if the firms introduced improved organizational or management practices and zero if not. The second variable in this category, 'Marketing innovation' takes unit value if the firm adopted new or significantly improved marketing methods and zero if not. As foreign ownership is an important determinant of innovation (e.g., Guadalupe et al. 2012), I include the dummy variable 'Foreign owned'. This takes a unit value if at least 50% of the firm is owned by a foreign owner and zero else. Moreover, I include an indicator variable 'Exporter', which takes unit value if the firm achieves above zero sales on foreign markets and zero else.

Furthermore, I add the following variables to account for additional effects related to country, industry, and time. First, I take up year indicators for the years the interviews in the BEEPS survey were performed. This allows for considering cohort-specific effects. Second, I apply a set of industry dummies to incorporate the impact of industry-specific variations in the decision to hire consultants and firms' innovation activities. Last, I include country-fixed effects to capture time-invariant characteristics, like institutional factors, that affect the probability of seeking external advice or conducting innovation.

The descriptive statistics of the sample of firms used in this analysis are shown in Table 1. First, it becomes evident that about 24% of the firms have hired an external consultant (column 1). The descriptive statistics show that the mean is about 4.6 for the number of consultancy visits. Next, the sample is split into firms that hired a consultant and those that did not (columns 3, 5). The individual differences and *p*-values for their comparison are shown in columns 7 and 8. The results imply that firms that hire external consultants are significantly larger and older. Moreover, they are more exposed to foreign influences, as indicated by a higher share of foreign ownership and exporting behavior. Related to the existing knowledge

base and ability to absorb knowledge, the results imply that consultant hiring firms are more likely to be R&D active. Moreover, firms that rely on external advisory services are more likely to adjust to the strategic environment regarding management and marketing. Concerning the innovation variables, the descriptive statistics in Table 1 imply that firms which hire external consultants are more likely to conduct product and process innovation. Moreover, they are more likely to perform more ambitious innovation projects, namely projects that are new to the market or combine product and process innovation.

Table 1: Descriptive statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Sample		No consultant		Consultant		Difference	
	Mean	SD	Mean	SD	Mean	SD	(5)-(3)	*p*-value
Consultant	0.238	0.426	0.000	0.000	1.000	0.000		
Number of consultancy visits	1.106	4.289	0.000	0.000	4.638	7.795		
Number of employees	29.890	40.443	27.392	37.521	37.869	47.752	10.477***	(0.000)
Firm age	14.929	10.927	14.491	10.282	16.327	12.671	1.836***	(0.000)
Capital city	0.207	0.405	0.202	0.402	0.222	0.416	0.020**	(0.021)
Foreign owned	0.061	0.239	0.048	0.214	0.101	0.302	0.053***	(0.000)
Part of firm group	0.075	0.263	0.067	0.250	0.100	0.300	0.033***	(0.000)
Export active	0.209	0.407	0.178	0.383	0.309	0.462	0.131***	(0.000)
Former state owned	0.082	0.275	0.082	0.274	0.084	0.277	0.002	(0.683)
R&D active	0.103	0.305	0.073	0.259	0.202	0.402	0.130***	(0.000)
Management innovation	0.212	0.409	0.173	0.379	0.335	0.472	0.162***	(0.000)
Marketing innovation	0.235	0.424	0.202	0.402	0.338	0.473	0.135***	(0.000)
Product innovation	0.249	0.432	0.209	0.406	0.377	0.485	0.169***	(0.000)
Process innovation	0.199	0.399	0.167	0.373	0.300	0.459	0.133***	(0.000)
No product innovation	0.751	0.432	0.791	0.406	0.623	0.485	-0.169***	(0.000)
Product innovation (firm)	0.074	0.261	0.065	0.246	0.103	0.304	0.039***	(0.000)
Product innovation (market)	0.175	0.380	0.144	0.351	0.274	0.446	0.130***	(0.000)
No innovation	0.687	0.464	0.733	0.443	0.541	0.498	-0.192***	(0.000)
Process innovation only	0.064	0.245	0.059	0.235	0.082	0.274	0.023***	(0.000)
Product innovation only	0.114	0.318	0.100	0.300	0.158	0.365	0.059***	(0.000)
Product and process innovation	0.135	0.342	0.109	0.311	0.219	0.413	0.110***	(0.000)
Observations	12145		9249		2896		12145	

Notes: The table shows the descriptive statistics for the sample described in Section 3.1. Mean values are reported in columns 1, 3, and 5. The values in parentheses in column 8 represent the *p*-values of the test with the null hypothesis indicated in the heading of column 7. The alternative hypothesis is the inequality of the values in the respective heading.

3.3 Empirical strategy

Next, I analyze the impact of hiring external consultants on firms' innovation behavior. For this purpose, I apply a combination of matching and logit regressions to determine the probability of performing an innovation conditional on hiring an external consultant. This relationship is depicted in equation (1),

$$\text{Innovation}_i = \beta_0 + \tau_1 \text{Consultant}_i + \beta X_i + \varepsilon_i \quad (1)$$

where Innovation_i is a dummy variable that takes value one if the firm performed an innovation and zero else. The variable Consultant_i is one of the above-presented consultancy measures. These include a dummy variable which indicates whether a firm hired an external consultant, or a continuous variable for the number of consultancy visits. The coefficient τ_1 informs about the change in the probability of performing an innovation dependent on hiring an external consultant in relation to the likelihood that no innovation was carried out – the odds ratio. A value above (below) one indicates that the probability of performing an innovation increases (decreases). For the average impact of hiring consultants on innovation (H1), the coefficient τ_1 is expected to be larger than one (a positive relationship). For the continuous consultant visits measures, a coefficient above one (positive) for the number of visits and a coefficient below one (negative) for its square are expected (H2). The matrix X includes the additional control variables described in Section 3.2.

I extend the estimation methodology to test for the ambitiousness of innovation projects to a multinomial logit approach. This is necessary as the variables 'Product innovation type' and 'Innovation type combination' used in this part of the analysis are categorical and consist of more than two realizable values. Thus, I follow the literature analyzing the determinants of innovation ambitions in terms of disruptiveness and types (e.g., Tang 2006; Vega-Jurado et al. 2008; Karlsson & Tavassoli 2016; Rodriguez et al. 2017; Hsieh et al. 2018; Abbas et al. 2022) by determining the probability that category *j* of the *J* available is realized using a maximum

likelihood estimation method:

$$P(\text{Innovation type} = j) = \frac{\exp(X_i'\beta_j)}{\sum_{j=0}^{J}\exp(X_i'\beta_k)}, \quad j = 0, 1, \ldots, J \qquad (2)$$

An advantage of estimating a multinomial logit model is that it allows me to determine the probability that category *j* is realized relative to a baseline category, which is no innovation in the used approach. This enables calculating the odds of choosing the respective innovation type relative to performing no innovation, similar to the logit estimation before.

I further account for the endogeneity of hiring external consultants. As shown in Table 1, firms decide whether to use a consulting service based on various parameters such as size, age, and strategy. Thus, the decision to hire external consultants is likely a non-random process. I apply inverse probability weighting to correct this potential selection bias (e.g., Imbens & Wooldridge 2009; Abadie & Cattaneo 2018). For this purpose, I perform a probit regression including the control variables described in Section 3.2 to obtain the predicted probability of hiring an external consultant dependent on observable firm characteristics – the propensity score (ps_i). The results are shown in Appendix B, Table B1. In the second step, I restrict the observations to a region of common support, where the distribution of the propensity scores for treated and control observations overlap. Due to this restriction, I discard 80 observations from the sample. Next, I construct the inverse probability weights (w_i) as $w_i = 1/ps_i$ for treated and $w_i = 1/(1 - ps_i)$ for not treated units.

To assess the quality of the matching process, I compare the weighted means of the control variables for firms that hired external consultants to those that did not. The results in Appendix B, Table B2 imply that the differences in means between the treatment and control groups are not statistically significantly different. This result points towards the conclusion that the matching algorithm performed well. Finally, I apply the weights to the regression and combine the before-described weighting approach with regression adjustment (e.g., Imbens 2004;

Imbens & Wooldridge 2009; Abadie & Cattaneo 2018).

4 Results

4.1 Baseline results

The results of estimating equation (1) to determine the effects of hiring external consultants on firm innovation (H1) are shown in Table 2, columns (1) and (3). They imply that there are significant differences in innovation outcomes between firms that hire consultants and those that do not. The estimate in Table 2, column (1) indicates that the odds for firms that hired an external consultant are about 1.7 times larger to carry out a product innovation. For process innovation (column 3), the odds of performing a process innovation are about 1.4 times larger for firms that use external consulting services. Thus, firms that hire external consultants benefit in terms of their innovation output. This confirms the theoretical expectation (H1) formulated in Section 2.

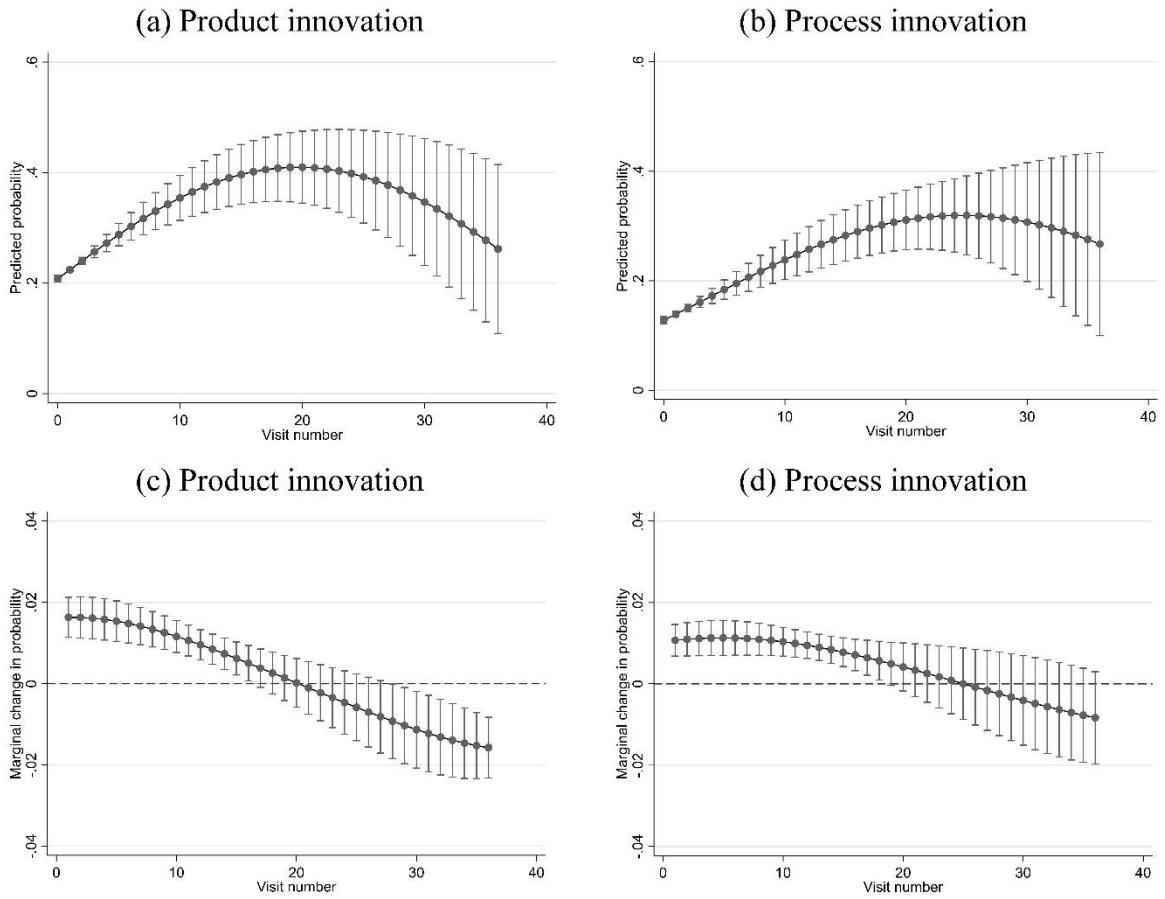
The estimated coefficients for the impact of the number of interactions on innovation are shown in Table 2, columns (2) and (4). The results imply that the effect of the number of visits on performing an innovation follows the shape of an inverted U, which approves hypothesis 2 (H2). Thus, the probability of achieving an innovation increases until reaching a tipping point and decreases after that. This implies that the net effect remains positive but decreases with each additional visit. This is consistent with the idea that firms can appropriate the benefits of this relationship, which are diminishing with the number of visits. Figure 2 shows the predicted probability (panels a and c) and the marginal change in the probability (panels c and d) of performing an innovation conditional on the number of consultancy visits. The results align with the expectation described in Section 2 that the relationship between consultant usage and innovation is an inverted U (H2). Thus, the marginal effect decreases with each additional visit and becomes negative at the abovementioned thresholds. Consequently, more visits are not always better for the innovation success of firms.

Table 2: The impact of hiring an external consultant on innovation

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.650***		1.413***	
	(0.118)		(0.078)	
Number of consultancy visits		1.104***		1.099***
		(0.017)		(0.020)
Number of consultancy visits squared		0.997***		0.998***
		(0.001)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.212	0.209	0.280	0.283
Observations	12065	12065	12065	12065

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market), and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Figure 2: The impact of the number of consultancy visits on innovation



Notes: The figure shows the predicted probability (panels a and c) and the marginal change in the predicted probability (panels c and d) of performing the innovation type indicated in the panel heading conditional on the number of consultancy visits. Calculations are based on the estimation of equation (1) and the corresponding results in Table 2. Whiskers indicate 95% confidence intervals.

4.2 Innovation heterogeneity

The results presented in section 4.1 imply that hiring external consultants is positively associated with firm innovation. To further analyze this relationship, I continue determining the degree of ambitiousness of the innovation projects. For this purpose, I first distinguish product innovation in those new to the market and those new to the firm. While both degrees of disruptiveness require some effort, introducing an innovation new to the market might be more likely if firms have access to external knowledge and skills. The results when using the multinomial logit estimation approach described in Section 3.4 are shown in Table 3. It becomes evident that the baseline results hold for both types (columns 1 and 2). Although the

coefficient for product innovation new to the market is slightly larger (column 2), it is not statistically significantly different on conventional levels from the impact on innovation new to the firm. However, when considering the number of visits, the results imply that the effect is again stronger for innovation new to the market and that this effect is larger than that on innovation new to the firm (columns 3 and 4). This allows the conclusion that firms that hire external consultants perform more ambitious innovation projects in terms of disruptiveness.

In the second step, I analyze the product and process innovation combinations. Firms might pursue more ambitious projects involving both innovation types when using external consultants. The results when applying the categorical variable 'Innovation type combination' in a multinomial logit estimation approach are shown in Table 4. Comparing the impact of external consultants on process and product innovation implies that the effect is larger for the latter (columns 1 and 2). The test for the equality of the coefficients at the bottom of the table implies that they are statistically significantly different. This also holds for the combination of product and process innovation, as analyzed in column (3). A similar observation is made for the number of visits in columns (4) to (6). Although the effect is larger for the combination of product and process innovation (column 6), the size of the *p*-values at the bottom of the table implies that the coefficients (columns 4 to 6) are not statistically significantly different. Thus, firms that hire external consultants are more likely to pursue more ambitious innovation projects involving product and process innovation.

Table 3: The disruptiveness of the performed innovation type

	(1)	(2)	(3)	(4)
	Product innovation type		Product innovation type	
	New to firm	New to market	New to firm	New to market
Consultant	1.538***	1.706***		
	(0.156)	(0.122)		
Number of consultancy visits			1.076***	1.119***
			(0.024)	(0.020)
Number of consultancy visits squared			0.998**	0.997***
			(0.001)	(0.001)
Test for coefficient differences of consultancy variables across equations (*p*-value)				
H_0: (1) = (2)		0.263		
H_0: (3) = (4)				0.136
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared			0.001	0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.181		0.178	
Observations	12065		12065	

Notes: The table shows the results of estimating multinomial logit models of equation (2) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm) and product innovation (new to the market). The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table 4: The impact on the combination of innovation types

	(1)	(2)	(3)	(4)	(5)	(6)
	Innovation type combination			Innovation type combination		
	Process	Product	Product and process	Process	Product	Product and process
Consultant	1.480***	1.756***	1.759***			
	(0.126)	(0.174)	(0.128)			
Number of consultancy visits				1.113***	1.112***	1.146***
				(0.024)	(0.021)	(0.026)
Number of consultancy visits squared				0.998***	0.997***	0.997***
				(0.001)	(0.001)	(0.001)
Test for coefficient differences of consultancy variables across equations (*p*-value)						
H_0: (1) = (2)		0.043				
H_0: (1) = (3)		0.023				
H_0: (2) = (3)		0.984				
H_0: (4) = (5)					0.926	
H_0: (4) = (6)					0.187	
H_0: (5) = (6)					0.166	
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)						
H_0: visits = visits squared				0.000	0.000	0.000
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared		0.213			0.213	
Observations		12065			12065	

Notes: The table shows the results of estimating multinomial logit models of equation (2) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for sole product and product innovation or their combination. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

4.3 Limitations and robustness tests of the main results

The results presented in Section 4.1 clearly show that consulting is positively associated with innovation. However, there are limitations related to the data and methodology applied. I first address problems related to the survey data used in this study, namely the possibility of a common method bias (e.g., Podsakoff et al. 2003). Thus, the association shown in this paper might result rather from the construction of the survey and how it is conducted than an actual relationship (e.g., Podsakoff et al. 2003). To overcome this potential for issues, the survey methodology reduces bias as much as possible (McCann & Bahl 2017; Cirera & Muzi 2020). This includes, among others, questions that ask about actual events, not perceptions, but also that the scales for the outcome and independent variables are different (e.g., McCann & Bahl 2017). However, there might still be room for wrong or biased answers that affect the presented results. To test for this possibility, I repeat the analysis in Section 4.1 by accounting (i) for interviewer experience and (ii) characteristics of the interviewed person, but also (iii) by using only answers which are considered truthful and precise. The results are robust to these changes (Appendix D, Tables D1, D2, and D3).

A further limitation of this study might stem from the countries in Eastern Europe and Central Asia where the surveyed firms are located. Firms operating in the European Union (EU) might use its economic environment, which puts them in a different economic perspective. Therefore, I re-estimated the results in Section 4.1 for EU and non-EU countries (Table A1). The results in Appendix D, Tables D4 and D5 reinforce the previous results for EU and non-EU countries. Extending these considerations by discarding advanced countries, according to IMF (2016), from the list of emerging markets (Table A1) also does not alter the results remarkably (Appendix D, Table D6). Furthermore, re-performing the baseline estimations without the countries with the largest observations share (Russia and Turkey) does

not change the results largely (Appendix D, Table D7).

Another limitation of the study is related to the issue of endogeneity. Although the empirical approach outlined in Section 3.4 accounts for observable differences between the firms that hire external consultants or not, it might be the case that the estimates shown in Section 4.1 are biased due to the choice of the specific matching algorithm or unobserved factors. Particularly the latter could lead to serious bias in the results since the positive effect might be related to the omission of firm or consultant-specific variables. Consequently, I apply two additional tests to account for these issues. First, I utilize other matching algorithms and repeat the analysis in Section 4.1. These approaches include 1-to-1 nearest neighbor matching (Imbens & Wooldridge 2009; Abadie & Cattaneo 2018), overlap weights (Li et al. 2018), or coarsened exact matching (Iacus et al. 2012). The results in Appendix D, Tables D8, D9, D10 and D11 are robust to these changes. Second, I determine the impact of selection on unobservables (e.g., Altonji et al. 2005; Krauth 2016; Oster 2019) for the estimates presented in Section 4.1. The results applying the approach by Oster (2019) imply that unobservable factors are not a particular driver of the patterns observed.

A further set of limitations of the main results is related to the indicators used as dependent variables, namely product and process innovation. The outcome measure of interest depicts the innovation outcome in the firm's last three years. However, an explicit limitation of the approach in this paper is that there is no exact information on the timing of the innovation. Thus, more granular data on the innovation outcome of the firm would be needed. That does not only include the timing of the innovation but also information on its type and composition. This would allow for a more holistic analysis of the impact of external skills and knowledge provided by the consultants on innovation. However, exploiting the available information by considering the disruptiveness of the innovation and the innovation types allows me to provide

some further insights. These extensions presented in Section 4.2 imply that firms that hire external consultants perform more ambitious innovation.

Another limitation might stem from the variable of interest, the consultancy measure. The applied yes-no variable does not provide direct insights into the concrete actions taken and how they affect the firm's innovation behavior. Although the visits variable allows me to draw a more detailed picture, it lacks a nuanced measurement of firm-consultant interactions. The latter yields another issue, as it is not possible with the data at hand to observe the change in the consultant or the consulting firm. Since accounting for these limitations is impossible with the utilized World Bank data, the demand for more nuanced approaches, such as the experimental settings in Bloom et al. (2013) and Bruhn et al. (2018), exists. To reduce the bias from the measures to a large degree, I rely on Haans et al. (2016) during the empirical analysis. Thus, for example, I use the winsorized visits variable, provide visual evidence to illustrate the turning point of the inverted U, and show the significance of the squared visits term. However, in further tests, I also investigate the sensitivity of the results in Section 4.1 to changes in the consultancy visits variable. Thus, the estimations in Section 4.1 have been repeated by using the visits variable in its original form and altering it by applying the natural logarithm or the inverse hyperbolic sine transformation (e.g., Bellemare & Wichman 2020). The results concerning the impact of the consulting intensity are reinforced (Appendix D, Table D12).

5 Conclusion

Utilizing a sample of firms from 32 countries, my results imply that hiring an external consultant is positively associated with a higher probability of innovation output and more ambitious innovation in terms of disruptiveness and the number of innovation types. This analysis for emerging markets complements the finding of a positive effect of external

knowledge and skills on innovation in developed countries (e.g., Arora & Gambardella 1994; Cassiman & Veugelers 2006; Laursen & Salter 2006; West & Bogers 2014; Bianchi et al. 2016) and in emerging markets (e.g., Almeida and Fernandes 2008; Torres de Oliveira et al. 2022). Extending these considerations, the empirical results imply that the relationship between consultancy visits and innovation has the shape of an inverted U. Moreover, the marginal impact of each additional consulting visit is decreasing. This underlines the notion that there are diminishing returns from excessive consulting interactions (e.g., Laursen & Salter 2006; Salter et al. 2015; Ebersberger et al. 2021). These findings lead to the conclusion that more consulting is not always better.

The results of my analysis have implications for firms, practitioners, and policymakers. Firms should consider hiring external consultants to close the gap with market leaders or to achieve a competitive advantage. Although consulting is beneficial and can help to perform innovation, consulting interactions contribute positively only up to a certain point, so caution has to be paid. Consequently, firms have to carefully plan the usage of consultancy services and how to implement the outcome of the advisory process efficiently. For policymakers, the findings in this study imply that it is worth conducting advisory programs targeting firms in emerging markets. This notion aligns with the literature (e.g., Chrisman & Katrishen 1994; Cumming & Fischer 2012), which finds positive effects of public advisory impact on firm performance. While it is shown that external advice exerts positive effects, policies should be carefully designed to not over-consult. The results of this study imply that there are diminishing returns from consultancy interactions. Consequently, the notion that ’More is not always better’ should be considered when planning the allocation of consulting resources.

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No potential conflict of interest was reported by the author(s).

Data availability statement

The data that support the findings of this study are available from the World Bank and the European Bank for Reconstruction and Development.

References

Abadie, A. & Cattaneo, M. D. (2018). Econometric methods for program evaluation. *Annual Review of Economics*, 10, 465–503.

Abbas, S., Adapa, S., Sheridan, A., & Azeem, M. M. (2022). Informal competition and firm level innovation in South Asia: The moderating role of innovation time off and R&D intensity. *Technological Forecasting and Social Change*, 181, 121751.

Almeida, R., & Fernandes, A. M. (2008). Openness and technological innovations in developing countries: evidence from firm-level surveys. *The Journal of Development Studies*, 44(5), 701-727.

Altonji, J. G., Elder, T. E., & Taber, C. R. (2005). Selection on observed and unobserved variables: Assessing the effectiveness of Catholic schools. *Journal of Political Economy*, *113*(1), 151–184.

Anand, J., McDermott, G., Mudambi, R., & Narula, R. (2021). Innovation in and from emerging economies: New insights and lessons for international business research. *Journal of International Business Studies*, *52*(4), 545–559.

Arora, A. & Gambardella, A. (1994). Evaluating technological information and utilizing it: Scientific knowledge, technological capability, and external linkages in biotechnology. *Journal of Economic Behavior & Organization*, *24*(1), 91–114.

Audretsch, D. B., & Belitski, M. (2020). The role of R&D and knowledge spillovers in innovation and productivity. European Economic Review, 123, 103391.

Audretsch, D. B., & Feldman, M. P. (1996). R&D spillovers and the geography of innovation and production. The American economic review, 86(3), 630-640.

Ayyagari, M., Demirguc-Kunt, A., & Maksimovic, V. (2011). Firm Innovation in Emerging Markets: The Role of Finance, Governance, and Competition. *Journal of Financial and*

Quantitative Analysis, *46*(6), 1545–1580.

Back, Y., Parboteeah, K. P., & Nam, D.-i. (2014). Innovation in emerging markets: The role of management consulting firms. *Journal of International Management*, *20*(4), 390– 405.

Bellemare, M. F. & Wichman, C. J. (2020). Elasticities and the inverse hyperbolic sine transformation. *Oxford Bulletin of Economics and Statistics*, *82*(1), 50–61.

Besley, T. & Case, A. (1993). Modeling technology adoption in developing countries. *The American* Economic *Review*, *83*(2), 396–402.

Bettencourt, L. A., Ostrom, A. L., Brown, S. W., & Roundtree, R. I. (2002). Client coproduction in knowledge-intensive business services. *California management review*, *44*(4), 100–128.

Bianchi, M., Croce, A., Dell'Era, C., Di Benedetto, C. A., & Frattini, F. (2016). Organizing for inbound open innovation: how external consultants and a dedicated R&D unit influence product innovation performance. *Journal of Product Innovation Management*, *33*(4), 492–510.

Bloom, N., Brynjolfsson, E., Foster, L., Jarmin, R., Patnaik, M., Saporta-Eksten, I., & Van Reenen, J. (2019). What drives differences in management practices? *American Economic Review*, *109*(5), 1648–83.

Bloom, N., Eifert, B., Mahajan, A., McKenzie, D., & Roberts, J. (2013). Does management matter? Evidence from India. *The Quarterly Journal of Economics*, *128*(1), 1–51.

Bruhn, M., Karlan, D., & Schoar, A. (2018). The impact of consulting services on small and medium enterprises: Evidence from a randomized trial in Mexico. *Journal of Political Economy*, 126(2), 635–687.

Camisón, C., & Villar-López, A. (2014). Organizational innovation as an enabler of technological innovation capabilities and firm performance. *Journal of Business Research*, 67(1), 2891-2902.

Cassiman, B. & Veugelers, R. (2006). In search of complementarity in innovation strategy: Internal R&D and external knowledge acquisition. *Management Science*, 52(1), 68–82.

Cavusgil, S. T. (2021). Advancing knowledge on emerging markets: Past and future research in perspective. *International Business Review*, 30(2), 101796.

Cerruti, C., Tavoletti, E., & Grieco, C. (2019). Management consulting: A review of fifty years of scholarly research. *Management Research Review*, 42(8), 902-925.

Chatterji, A., Delecourt, S., Hasan, S., & Koning, R. (2019). When does advice impact startup performance? *Strategic Management Journal*, *40(3), 331–356*.

Chen, Y. & Puttitanun, T. (2005). Intellectual property rights and innovation in developing countries. *Journal of Development Economics*, *78*(2), 474–493.

Chrisman, J. J. & Katrishen, F. (1994). The economic impact of small business development

center counseling activities in the United States: 1990–1991. *Journal of Business Venturing*, *9*(4), 271–280.

Chrisman, J. J., McMullan, E., & Hall, J. (2005). The influence of guided preparation on the long-term performance of new ventures. *Journal of Business Venturing*, *20*(6), 769–791.

Cirera, X. & Muzi, S. (2020). Measuring innovation using firm-level surveys: Evidence from developing countries. *Research policy*, *49*(3), 103912.

Cumming, D. J. & Fischer, E. (2012). Publicly funded business advisory services and entrepreneurial outcomes. *Research Policy*, *41*(2), 467–481.

D'Antone, S. & Santos, J. B. (2016). When purchasing professional services supports innovation. *Industrial Marketing Management*, *58*, 172–186.

Deeds, D. L. & Hill, C. W. (1996). Strategic alliances and the rate of new product development: An empirical study of entrepreneurial biotechnology firms. *Journal of Business Venturing*, *11*(1), 41–55.

Dulleck, U. & Kerschbamer, R. (2006). On doctors, mechanics, and computer specialists: The economics of credence goods. *Journal of Economic literature*, *44*(1), 5–42.

Ebersberger, B., Galia, F., Laursen, K., & Salter, A. (2021). Inbound Open Innovation and Innovation Performance: A Robustness Study. *Research Policy*, *50*(7), 104271.

Fagerberg, J., Srholec, M. and Verspagen, B. (2010). Innovation and economic development. In H.H. Bronwyn and N. Rosenberg (eds.), Handbook of the Economics of Innovation, Vol. 2 (pp. 833–872). Netherlands, Amsterdam: Elsevier

Fu, X., Pietrobelli, C., & Soete, L. (2011). The role of foreign technology and indigenous innovation in the emerging economies: Technological change and catching-up. *World Development*, *39*(7), 1204–1212.

Gentile, E. (2020). Intellectual property rights and foreign technology licensing in developing countries: An empirical investigation. *Economic Development and Cultural Change*, 68(2), 655-698.

Giebel, M. (2020). External Consultants and Innovation. In Academy of Management Proceedings, Vol. 2020, No. 1, p. 13491.

Gorodnichenko, Y. & Schnitzer, M. (2013). Financial constraints and innovation: Why poor countries don't catch up. *Journal of the European Economic Association*, *11*(5), 1115–1152.

Gorodnichenko, Y., Svejnar, J., & Terrell, K. (2010). Globalization and innovation in emerging markets. *American Economic Journal: Macroeconomics*, *2*(2), 194–226.

Grimpe, C. & Kaiser, U. (2010). Balancing internal and external knowledge acquisition: The gains and pains from R&D outsourcing. *Journal of Management Studies*, *47*(8), 1483–1509.

Guadalupe, M., Kuzmina, O., & Thomas, C. (2012). Innovation and foreign ownership. *American* Economic *Review*, *102*(7), 3594–3627.

Haans, R. F., Pieters, C., & He, Z. L. (2016). Thinking about U: Theorizing and testing U-and inverted U-shaped relationships in strategy research. *Strategic Management Journal*, 37(7), 1177-1195.

Hertog, P. D. (2000). Knowledge-intensive business services as co-producers of innovation. *International Journal of Innovation Management*, *4*(04), 491–528.

Hoskisson, R. E., Eden, L., Lau, C. M., & Wright, M. (2000). Strategy in emerging economies. *Academy of Management Journal*, *43*(3), 249–267.

Hsieh, W. L., Ganotakis, P., Kafouros, M., & Wang, C. (2018). Foreign and domestic collaboration, product innovation novelty, and firm growth. *Journal of Product Innovation Management*, 35(4), 652-672.

Iacovone, L., Maloney, W., & McKenzie, D. (2022). Improving management with individual and group-Based consulting: Results from a randomized experiment in Colombia. *The Review of Economic Studies*, *89*(1), 346—-371.

Iacus, S. M., King, G., & Porro, G. (2012). Causal inference without balance checking: Coarsened exact matching. *Political Analysis*, *20*(1), 1–24.

Imbens, G. W. (2004). Nonparametric estimation of average treatment effects under exogeneity: A review. *Review of Economics and Statistics*, *86*(1), 4–29.

Imbens, G. W. & Wooldridge, J. M. (2009). Recent developments in the econometrics of program evaluation. *Journal of Economic Literature*, *47*(1), 5–86.

IMF, I. (2016). IMF world economic outlook: Too slow for too long. *Washington, DC: International Monetary Fund*.

Karlsson, C., & Tavassoli, S. (2016). Innovation strategies of firms: What strategies and why?. *The Journal of Technology Transfer*, 41, 1483-1506.

Kose, M. A., & Prasad, E. S. (2010). Emerging markets come of age. Finance & Development: 7–10.

Kotabe, M., Jiang, C. X., & Murray, J. Y. (2017). Examining the complementary effect of political networking capability with absorptive capacity on the innovative performance of emerging-market firms. *Journal of Management*, *43*(4), 1131–1156.

Krammer, S. M. (2019). Greasing the wheels of change: Bribery, institutions, and new product introductions in emerging markets. *Journal of Management*, *45*(5), 1889–1926.

Krauth, B. (2016). Bounding a linear causal effect using relative correlation restrictions. *Journal of Econometric Methods*, *5*(1), 117–141.

Laursen, K. & Salter, A. (2006). Open for innovation: the role of openness in explaining innovation performance among UK manufacturing firms. *Strategic Management Journal*, *27*(2), 131–150.

Li, F., Morgan, K. L., & Zaslavsky, A. M. (2018). Balancing covariates via propensity score

weighting. *Journal of the American Statistical Association*, *113*(521), 390–400.

Lichtenthaler, U. & Lichtenthaler, E. (2009). A capability-based framework for open innovation: Complementing absorptive capacity. *Journal of Management Studies*, *46*(8), 1315–1338.

Mas-Verdú, F., Wensley, A., Alba, M., & García Álvarez-Coque, J. M. (2011). How much does KIBS contribute to the generation and diffusion of innovation? *Service Business*, *5*(3), 195–212.

Mateut, S. (2018). Subsidies, financial constraints and firm innovative activities in emerging economies. *Small Business Economics*, 50(1), 131-162.

McCann, B. T. & Bahl, M. (2017). The influence of competition from informal firms on new product development. *Strategic Management Journal*, *38*(7), 1518–1535.

Muller, E. & Doloreux, D. (2009). What we should know about knowledge-intensive business services. *Technology in Society*, *31*(1), 64–72.

Muller, E. & Zenker, A. (2001). Business services as actors of knowledge transformation: The role of KIBS in regional and national innovation systems. *Research Policy*, *30*(9), 1501–1516.

OECD (2021). *Business Insights on Emerging Markets 2021*, volume 2021. OECD Development Centre, Paris: OECD Emerging Markets Network.

Oster, E. (2019). Unobservable selection and coefficient stability: Theory and evidence. *Journal of Business & Economic Statistics*, *37*(2), 187–204.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879.

Rodriguez, M., Doloreux, D., & Shearmur, R. (2017). Variety in external knowledge sourcing and innovation novelty: Evidence from the KIBS sector in Spain. *Technovation*, 68, 35-43.

Rubera, G. & Kirca, A. H. (2012). Firm innovativeness and its performance outcomes: A meta-analytic review and theoretical integration. *Journal of Marketing*, *76*(3), 130– 147.

Ruch, F. U. (2020). Policy challenges for emerging and developing economies: Lessons from the past decade. *World Bank Policy Research Working Paper*, (9180).

Sachs, J. D., Schmidt-Traub, G., Mazzucato, M., Messner, D., Nakicenovic, N., & Rockström, J. (2019). Six transformations to achieve the sustainable development goals. *Nature Sustainability*, *2*(9), 805–814.

Salter, A., Ter Wal, A. L., Criscuolo, P., & Alexy, O. (2015). Open for ideation: Individual-level openness and idea generation in R&D. *Journal of Product Innovation Management*, *32*(4), 488–504.

Schumpeter, J. A. (1942). *Capitalism, socialism and democracy*. New York: Harper and

Brothers.

Tang, J. (2006). Competition and innovation behaviour. *Research policy*, 35(1), 68-82.

Tether, B. S. & Tajar, A. (2008). Beyond industry–university links: Sourcing knowledge for innovation from consultants, private research organisations and the public science-base. *Research Policy*, *37*(6-7), 1079–1095.

Torres de Oliveira, R., Gentile-Lüdecke, S., & Figueira, S. (2022). Barriers to innovation and innovation performance: the mediating role of external knowledge search in emerging economies. *Small Business Economics*, 58(4), 1953-1974.

Vega-Jurado, J., Gutiérrez-Gracia, A., Fernández-de-Lucio, I., & Manjarrés-Henríquez, L. (2008). The effect of external and internal factors on firms' product innovation. *Research policy*, 37(4), 616-632.

Wang, F., & Chen, K. (2020). Do product imitation and innovation require different patterns of organizational innovation? Evidence from Chinese firms. *Journal of Business Research*, 106, 60-74.

West, J. & Bogers, M. (2014). Leveraging external sources of innovation: A review of research on open innovation. *Journal of Product Innovation Management*, *31*(4), 814– 831.

West, J., Salter, A., Vanhaverbeke, W., & Chesbrough, H. (2014). Open innovation: The next decade. *Research Policy*, *43*(5), 805–811.

Wright, M., Filatotchev, I., Hoskisson, R. E., & Peng, M. W. (2005). Strategy research in emerging economies: Challenging the conventional wisdom. *Journal of Management Studies*, *42*(1), 1–33.

Zanello, G., Fu, X., Mohnen, P., & Ventresca, M. (2016). The creation and diffusion of innovation in developing countries: A systematic literature review. *Journal of Economic Surveys*, 30(5), 884-912.

Appendix

A Descriptive statistics

Table A1: Distribution of firms over countries

Country	Count	Share	EU country	Advanced economy
Albania	242	1.993		
Armenia	298	2.454		
Azerbaijan	298	2.454		
Belarus	288	2.371		
Bosnia and Herzegovina	320	2.635		
Bulgaria	257	2.116	Yes	
Croatia	311	2.561	Yes	
Cyprus	297	2.445	Yes	Yes
Czech Republic	215	1.770	Yes	Yes
Estonia	229	1.886	Yes	Yes
Georgia	267	2.198		
Greece	257	2.116	Yes	Yes
Hungary	222	1.828	Yes	
Kazakhstan	480	3.952		
Kosovo	163	1.342		
Kyrgyz Republic	229	1.886		
Latvia	232	1.910	Yes	Yes
Lithuania	177	1.457	Yes	Yes
Moldova	293	2.413		
Mongolia	307	2.528		
Montenegro	118	0.972		
Macedonia	338	2.783		
Poland	410	3.376	Yes	
Romania	472	3.886	Yes	
Russia	3162	26.035		
Serbia	297	2.445		
Slovak Republic	226	1.861	Yes	Yes
Slovenia	216	1.779	Yes	Yes
Tajikistan	244	2.009		
Turkey	928	7.641		
Ukraine	73	0.601		
Uzbekistan	279	2.297		
Observations	12145			

Notes: The table shows the count and share of firms over countries. The column EU country indicates whether a country belongs to the European Union. The column advanced economy marks countries that are declared advanced economies according to IMF (2016).

Table A2: Distribution of firms over industries

Description	ISIC code	Count	Share
Manufacturing	15 - 37	4613	37.983
Construction	45	1095	9.016
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	50 - 52	5257	43.285
Hotels and restaurants	55	530	4.364
Transport, storage and communications	60 - 64	650	5.352
Observations		12145	

Notes: The table shows the count and share of firms over industries. ISIC code refers to the International Standard Industrial Classification.

Table A3: Correlation matrix - innovation measures

	(1)	(2)	(3)	(4)
(1) Consultant	1			
(2) Number of consultancy visits	0.461	1		
(3) Product innovation	0.166	0.0861	1	
(4) Process innovation	0.142	0.0855	0.495	1

Notes: The table shows the correlation between innovation measures. The column heading refers to the variable and the corresponding number displayed on the left in the first column.

B Probit results and mean comparison after weighting

Table B1: The impact of firm determinants on the probability of hiring external consultants

	(1) Hired a consultant
Logarithm of employees	0.097***
	(0.014)
Logarithm of age	-0.085***
	(0.024)
Capital city	0.170***
	(0.037)
Foreign owned	0.293***
	(0.054)
Part of firm group	0.102**
	(0.051)
Export active	0.133***
	(0.036)
Former state owned	0.105**
	(0.052)
R&D active	0.395***
	(0.043)
Management innovation	0.364***
	(0.039)
Marketing innovation	0.133***
	(0.038)
Constant	-1.220***
	(0.157)
Country fixed effects	Yes
Industry fixed effects	Yes
Survey year fixed effects	Yes
Pseudo R-squared	0.115
Observations	12145

Notes: The table shows the Probit estimation results to determine the probability that the focal firm hired an external consultant. The dependent variable is an indicator that takes a unit value if the focal firm hired an external consultant and zero else.

Table B2: Mean comparison for firm determinants, weighted by inverse probability weights

	(1)	(2)	(3)	(4)
	Mean		Difference	
	Consultant			
	Hired	Not hired	(1)-(2)	*p*-value
Logarithm of employees	2.787	2.780	0.007	0.809
Logarithm of age	2.498	2.503	-0.005	0.768
Capital city	0.193	0.205	-0.011	0.283
Foreign owned	0.061	0.062	-0.001	0.921
Part of firm group	0.075	0.075	-0.000	0.977
Export active	0.207	0.210	-0.003	0.779
Former state owned	0.085	0.082	0.003	0.700
R&D active	0.103	0.107	-0.004	0.519
Management innovation	0.213	0.215	-0.002	0.860
Marketing innovation	0.241	0.238	0.003	0.788
Product innovation	0.311	0.237	0.074	0.000
Process innovation	0.233	0.194	0.039	0.000
No product innovation	0.689	0.763	-0.074	0.000
Product innovation (firm)	0.090	0.072	0.018	0.011
Product innovation (market)	0.221	0.165	0.056	0.000
No innovation	0.617	0.699	-0.082	0.000
Process innovation only	0.072	0.064	0.008	0.188
Product innovation only	0.150	0.107	0.043	0.000
Product and process innovation	0.161	0.130	0.031	0.000

Notes: The table shows the means of control variables for the treatment (Consultant) and control (No-consultant) groups. The treatment group consists of firms that hired an external consultant. The corresponding control group is comprised of firms that did not hire an external consultant. The difference in mean values is shown in column (3). The corresponding p-values are displayed in column (4).

C Extended results for the impact of hiring an external consultant on innovation

Table C1: The impact of hiring an external consultant on innovation

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.650***		1.413***	
	(0.118)		(0.078)	
Number of consultancy visits		1.104***		1.099***
		(0.017)		(0.020)
Number of consultancy visits squared		0.997***		0.998***
		(0.001)		(0.001)
Logarithm of employees	0.963	0.961	0.991	0.989
	(0.034)	(0.033)	(0.037)	(0.037)
Logarithm of age	1.052	1.054	1.121**	1.128**
	(0.069)	(0.070)	(0.054)	(0.054)
Capital city	1.121	1.116	1.058	1.047
	(0.182)	(0.185)	(0.111)	(0.108)
Foreign owned	1.002	0.995	0.833	0.824
	(0.101)	(0.098)	(0.148)	(0.148)
Part of firm group	1.048	1.026	1.191	1.169
	(0.130)	(0.128)	(0.222)	(0.208)
Export active	1.467***	1.443***	1.249**	1.228*
	(0.124)	(0.119)	(0.137)	(0.136)
Former state owned	0.789	0.799	0.934	0.943
	(0.123)	(0.126)	(0.147)	(0.147)

(*continued*)

Table C1: *Continued*

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
R&D active	3.028***	2.955***	2.771***	2.707***
	(0.244)	(0.219)	(0.251)	(0.238)
Management innovation	2.467***	2.413***	4.879***	4.825***
	(0.172)	(0.176)	(0.391)	(0.388)
Marketing innovation	2.866***	2.883***	2.803***	2.838***
	(0.330)	(0.333)	(0.250)	(0.252)
Constant	0.200***	0.220***	0.047***	0.047***
	(0.046)	(0.054)	(0.013)	(0.012)
Test for coefficient differences of consultancy visits and its square within equation (p-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.212	0.209	0.280	0.283
Observations	12065	12065	12065	12065

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table C2: The disruptiveness of the performed innovation type

	(1)	(2)	(3)	(4)
	Product innovation type		Product innovation type	
	New to firm	New to market	New to firm	New to market
Consultant	1.538***	1.706***		
	(0.156)	(0.122)		
Number of consultancy visits			1.076***	1.119***
			(0.024)	(0.020)
Number of consultancy visits squared			0.998**	0.997***
			(0.001)	(0.001)
Logarithm of employees	0.995	0.950	0.993	0.948
	(0.058)	(0.033)	(0.057)	(0.032)
Logarithm of age	1.098	1.033	1.103	1.034
	(0.065)	(0.091)	(0.067)	(0.092)
Capital city	1.057	1.153	1.054	1.148
	(0.252)	(0.173)	(0.251)	(0.178)
Foreign owned	1.047	0.984	1.039	0.978
	(0.155)	(0.112)	(0.153)	(0.108)
Part of firm group	0.916	1.098	0.903	1.072
	(0.162)	(0.152)	(0.158)	(0.150)
Export active	1.481***	1.461***	1.464***	1.433***
	(0.199)	(0.138)	(0.195)	(0.131)
Former state owned	0.535***	0.915	0.540***	0.928
	(0.093)	(0.161)	(0.096)	(0.164)

(*continued*)

Table C2: *Continued*

	(1)	(2)	(3)	(4)
	Product innovation type		Product innovation type	
	New to firm	New to market	New to firm	New to market
R&D active	2.196***	3.418***	2.157***	3.326***
	(0.302)	(0.256)	(0.286)	(0.235)
Management innovation	2.078***	2.652***	2.030***	2.597***
	(0.244)	(0.188)	(0.243)	(0.188)
Marketing innovation	2.540***	3.015***	2.558***	3.030***
	(0.399)	(0.352)	(0.403)	(0.356)
Constant	0.061***	0.124***	0.067***	0.137***
	(0.016)	(0.034)	(0.018)	(0.041)
Test for coefficient differences of consultancy variables across equations (p-value)				
H_0: (1) = (2)		0.263		
H_0: (3) = (4)				0.136
Test for coefficient differences of consultancy visits and its square within equation (p-value)				
H_0: visits = visits squared			0.001	0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared		0.181		0.178
Observations		12065		12065

Notes: The table shows the results of estimating multinomial logit models of equation (2) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm) and product innovation (new to the market). The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table C3: The impact on the combination of innovation types

	(1)	(2)	(3)	(4)	(5)	(6)
	Innovation type combination			Innovation type combination		
	Process	Product	Product and process	Process	Product	Product and process
Consultant	1.480***	1.756***	1.759***			
	(0.126)	(0.174)	(0.128)			
Number of consultancy visits				1.113***	1.112***	1.146***
				(0.024)	(0.021)	(0.026)
Number of consultancy visits squared				0.998***	0.997***	0.997***
				(0.001)	(0.001)	(0.001)
Logarithm of employees	0.940	0.923*	0.981	0.939	0.924*	0.979
	(0.059)	(0.042)	(0.044)	(0.059)	(0.042)	(0.042)
Logarithm of age	1.083	1.004	1.139**	1.091	1.004	1.147**
	(0.079)	(0.083)	(0.076)	(0.079)	(0.085)	(0.077)
Capital city	1.177	1.204	1.087	1.156	1.199	1.073
	(0.213)	(0.232)	(0.132)	(0.205)	(0.239)	(0.132)
Foreign owned	0.837	1.061	0.858	0.826	1.056	0.850
	(0.123)	(0.128)	(0.175)	(0.123)	(0.127)	(0.173)
Part of firm group	1.228	1.020	1.187	1.199	0.995	1.155
	(0.300)	(0.149)	(0.203)	(0.286)	(0.147)	(0.188)
Export active	1.179	1.479***	1.558***	1.157	1.455***	1.518***
	(0.180)	(0.173)	(0.192)	(0.178)	(0.168)	(0.186)
Former state owned	0.918	0.727	0.817	0.931	0.738	0.830
	(0.213)	(0.172)	(0.140)	(0.217)	(0.177)	(0.143)
R&D active	2.993***	3.211***	5.297***	2.946***	3.154***	5.161***
	(0.504)	(0.432)	(0.537)	(0.482)	(0.404)	(0.484)
Management innovation	5.194***	1.903***	6.363***	5.124***	1.856***	6.241***
	(0.494)	(0.246)	(0.617)	(0.484)	(0.248)	(0.609)

(*continued*)

Table C3: *Continued*

	(1)	(2)	(3)	(4)	(5)	(6)
	Innovation type combination			Innovation type combination		
	Process	Product	Product and process	Process	Product	Product and process
Marketing innovation	3.388***	3.169***	4.284***	3.430***	3.178***	4.341***
	(0.488)	(0.457)	(0.358)	(0.492)	(0.456)	(0.371)
Constant	0.008***	0.138***	0.048***	0.007***	0.156***	0.050***
	(0.002)	(0.049)	(0.014)	(0.002)	(0.059)	(0.014)
Test for coefficient differences of consultancy variables across equations (*p*-value)						
H_0: (1) = (2)		0.043				
H_0: (1) = (3)		0.023				
H_0: (2) = (3)		0.984				
H_0: (4) = (5)					0.926	
H_0: (4) = (6)					0.187	
H_0: (5) = (6)					0.166	
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)						
H_0: visits = visits squared				0.000	0.000	0.000
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared		0.213			0.213	
Observations		12065			12065	

Notes: The table shows the results of estimating multinomial logit models of equation (2) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for sole product and product innovation or their combination. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

D Results of robustness tests

Table D1: The impact of hiring an external consultant on innovation – accounting for interviewer fixed effects

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.644***		1.398***	
	(0.108)		(0.073)	
Number of consultancy visits		1.103***		1.097***
		(0.018)		(0.020)
Number of consultancy visits squared		0.998***		0.998**
		(0.001)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.235	0.233	0.302	0.305
Observations	12065	12065	12065	12065

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D2: The impact of hiring an external consultant on innovation – control for gender and seniority of the interviewed person

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.679***		1.422***	
	(0.124)		(0.077)	
Number of consultancy visits		1.107***		1.102***
		(0.017)		(0.021)
Number of consultancy visits squared		0.997***		0.998***
		(0.001)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.215	0.211	0.281	0.284
Observations	12005	12005	12005	12005

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D3: The impact of hiring an external consultant on innovation – use only answers that are considered truthful and precise

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.648***		1.448***	
	(0.149)		(0.086)	
Number of consultancy visits		1.105***		1.086***
		(0.019)		(0.021)
Number of consultancy visits squared		0.997***		0.998**
		(0.001)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.212	0.209	0.281	0.282
Observations	10109	10109	10109	10109

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D4: The impact of hiring an external consultant on innovation – EU countries

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.552***		1.474***	
	(0.135)		(0.128)	
Number of consultancy visits		1.087***		1.115***
		(0.034)		(0.040)
Number of consultancy visits squared		0.998*		0.998**
		(0.001)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.185	0.184	0.220	0.223
Observations	3470	3470	3470	3470

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D5: The impact of hiring an external consultant on innovation – non-EU countries

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.709***		1.373***	
	(0.174)		(0.102)	
Number of consultancy visits		1.123***		1.085***
		(0.019)		(0.024)
Number of consultancy visits squared		0.996***		0.999
		(0.001)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.222	0.219	0.309	0.311
Observations	8595	8595	8595	8595

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D6: The impact of hiring an external consultant on innovation – Without advanced countries

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.680***		1.379***	
	(0.137)		(0.081)	
Number of consultancy visits		1.100***		1.080***
		(0.018)		(0.020)
Number of consultancy visits squared		0.998***		0.999
		(0.001)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.217	0.213	0.285	0.288
Observations	10735	10735	10735	10735

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D7: The impact of hiring an external consultant on innovation – Without the largest countries in terms of observations: Russia and Turkey

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.761***		1.437***	
	(0.149)		(0.116)	
Number of consultancy visits		1.099***		1.092***
		(0.026)		(0.031)
Number of consultancy visits squared		0.998***		0.998*
		(0.001)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.212	0.206	0.274	0.276
Observations	7986	7986	7986	7986

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D8: Mean comparison for firm determinants, nearest neighbor matching

	(1)	(2)	(3)	(4)	(5)
	Mean		Difference		
	Consultant				
	Hired	Not hired	(1)-(2)	*p*-value	standardized
Logarithm of employees	2.967	2.933	0.034	0.337	0.031
Logarithm of age	2.562	2.549	0.013	0.543	0.020
Capital city	0.218	0.194	0.024	0.060	0.059
Foreign owned	0.096	0.086	0.009	0.326	0.036
Part of firm group	0.096	0.102	-0.006	0.524	-0.023
Export active	0.298	0.296	0.002	0.885	0.005
Former state owned	0.083	0.069	0.015	0.070	0.053
R&D active	0.188	0.183	0.005	0.679	0.016
Management innovation	0.321	0.322	-0.001	0.925	-0.003
Marketing innovation	0.326	0.343	-0.017	0.255	-0.040
Product innovation	0.367	0.311	0.056	0.000	0.125
Process innovation	0.294	0.264	0.030	0.040	0.072
No product innovation	0.633	0.689	-0.056	0.000	-0.125
Product innovation (firm)	0.100	0.084	0.017	0.062	0.061
Product innovation (market)	0.266	0.227	0.039	0.005	0.098
No innovation	0.550	0.606	-0.055	0.000	-0.118
Process innovation only	0.083	0.083	-0.000	0.968	-0.001
Product innovation only	0.156	0.130	0.026	0.019	0.077
Product and process innovation	0.211	0.181	0.030	0.020	0.083

Notes: The table shows the means of control variables for the treatment (Consultant) and control (No-consultant) groups. The treatment group consists of firms that hired an external consultant. The corresponding control group is comprised of firms that did not hire an external consultant. The difference in mean values is shown in column (3). The corresponding p-values are displayed in column (4). The last column (5) shows the standardized differences.

Table D9: The impact of hiring an external consultant on innovation – Nearest neighbor matching

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.401***		1.291***	
	(0.108)		(0.096)	
Number of consultancy visits		1.080***		1.085***
		(0.015)		(0.022)
Number of consultancy visits squared		0.998***		0.998**
		(0.000)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.226	0.225	0.309	0.311
Observations	5632	5632	5632	5632

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D10: The impact of hiring an external consultant on innovation – Overlap weights

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.456***		1.308***	
	(0.079)		(0.070)	
Number of consultancy visits		1.089***		1.093***
		(0.015)		(0.020)
Number of consultancy visits squared		0.998***		0.998***
		(0.000)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.220	0.219	0.288	0.290
Observations	12065	12065	12065	12065

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D11: The impact of hiring an external consultant on innovation – Coarsened Exact Matching (CEM) using employees, age and capital city as matching variables

	(1)	(2)	(3)	(4)
	Product innovation		Process innovation	
Consultant	1.473***		1.303***	
	(0.085)		(0.079)	
Number of consultancy visits		1.092***		1.087***
		(0.015)		(0.019)
Number of consultancy visits squared		0.998***		0.998***
		(0.000)		(0.001)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)				
H_0: visits = visits squared		0.000		0.000
Firm control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.235	0.234	0.296	0.297
Observations	12013	12013	12013	12013

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market) and process innovation. The variable of interest, 'Consultant', takes unit value if the firm hired an external consultant and is zero else. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.

Table D12: The impact of hiring an external consultant on innovation – Consultancy visits variable

	(1) Product	(2) Process	(3) Product	(4) Process	(5) Product	(6) Process	(7) Product	(8) Process
Consultancy visits	1.104***	1.099***						
	(0.017)	(0.020)						
Consultancy visits squared	0.997***	0.998***						
	(0.001)	(0.001)						
Consultancy visits (plain)			1.051***	1.058***				
			(0.012)	(0.016)				
Consultancy visits squared (plain)			0.999***	0.999**				
			(0.000)	(0.000)				
ihs(Consultancy visits)					1.238***	1.245***		
					(0.041)	(0.038)		
ln(Consultancy visits+1)							1.300***	1.316***
							(0.055)	(0.052)
Test for coefficient differences of consultancy visits and its square within equation (*p*-value)								
H_0: visits = visits squared	0.000	0.000	0.000	0.000				
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.235	0.234	0.208	0.282	0.210	0.283	0.210	0.283
Observations	12065	12065	12065	12065	12065	12065	12065	12065

Notes: The table shows the results of estimating logit models of equation (1) for the weighted sample. Odds ratios are presented. Outcome variables are indicators for product innovation (new to the firm or new to the market), and process innovation. The variable 'Number of consultancy visits' reflects the absolute number of visits, and 'Number of consultancy visits squared' is its square. Outcome variables in columns (5) and (6) are the inverse hyperbolic sine transformed number of consultancy visits. In columns (7) and (8), the number of consultancy visits is transformed using the natural logarithm plus one unit. Each regression includes control variables as described in Section 3.2 that are the logarithm of firm size, logarithm or firm age, but also dummy variables for location in the capital city, foreign-owned firms, business group membership, exporting activity, former state-owned firms, marketing innovation, management innovation, and R&D investment activity. Additionally, industry, survey year, and country fixed effects are added. Standard errors clustered at the country level are shown in parentheses. Significance: *, **, *** significant at the 10%, 5%, 1% level.