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# Market Orientation and Marketing Innovation Activities in the Czech Manufacturing Sector

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**Abstract:** Market competition drives organizations to higher efficiency. This paper analyses the relationship between the prevailing organization's market orientation and marketing innovation activities. The sample of organizations consists of business enterprises from the manufacturing sector in the Czech economy. Data come from the Community Innovation Survey in 2014 and are analyzed using the innovation process econometric modeling. This innovation survey covers the period of a 3 year J-curve of real GDP growth. Czechia is one of the most open economies in the world and has one of the largest shares of exports and imports to GDP. This paper evaluates four types of marketing innovation activities (design, pricing, placing and promotion methods) at the enterprise level as a factor of marketing capability. The analyzed sample consists of observations about new-to-the-market innovators and enterprises that did not engage in new-to-the-market innovation activities in the last three years. The second group are considered to be lower-level innovators, i.e., adaptors to technological change. This paper explores the relationship between local, national, European and World market orientation in addition to an enterprise's marketing innovation activities. The results suggest that not all types of marketing innovations are dependent on market orientation, while some have indirect positive and negative effects. Feedback and the future effects of marketing innovation activities are present at the enterprise level. Results also suggest that the marketing innovations of innovators form the manufacturing sector while they are dependent upon the strategies of enterprises to enter new geographical markets and gain the motivation to unlock new (hidden) demand.

**Keywords:** market orientation; international competition; business performance; marketing innovation; motivation; innovation strategies; exporters; manufacturing; marketing capabilities

**JEL Classification:** O31; M31; L60

## 1. Introduction

Market orientation as a theoretical discipline with a conceptual framework can be observed from the perspective of the theory of market orientation. This theory comes with a rather broad definition, stating that “Market orientation is the organizationwide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organizationwide responsiveness to it.” (Kohli and Jaworski 1990, p. 6). This theory focuses on the relationship between the “market orientation construct” and business performance, the organization's strategy, employee dispositions, innovative behavior, supply, demand-side factors, customer attitudes and behavior.

The enterprise's orientation based on distance is one of the observable "end-products" of the marketing orientation construct. This paper analyses the relationship between the construct and innovation behavior (as a mix of management decisions, the acquisition of knowledge and results of marketing intelligence analysis), innovation strategies (as a fragment of strategic behavior), innovative performance (as a fraction of overall enterprise performance) and other characteristics such as company size and ownership variables.

Extended market orientation theories add factors like culture (Narver and Slater 1990) and test the relationship between market orientation and constructs such as marketing capabilities, enterprise performance, cost leadership strategy, differentiation strategy and organizational power (Cacciolatti and Lee 2016). Core marketing processes (as marketing capabilities), like product development management, supply chain management and customer relationship management, are considered factors of an enterprise's market orientation that influence business performance (Jaakkola et al. 2016).

A review of the market capability literature by Kamboj and Rahman (2015) reveals a positive relationship between "doing great" in marketing capability dimension and business performance. However, they did not identify any issues or problems with the research methodology and data collection and representativeness. Are all industries directly comparable? Is the understanding of marketing capabilities similar in all industries' trade, manufacturing and services? Are the indicators used in the studies (market share, customer satisfaction, sales growth, profitability and ROI) a good enough or even a comparable approximation of business performance? There are a lot of methodological issues that raise new research questions and need further research.

Strategic intentions form enterprises' directions; that is why multinationals and exporters have recently gained a lot of attention from business economics scholars. The issue with previous research is the endogeneity between the enterprise's internal factors (processes, capabilities, performance outcomes and other organizational characteristics). To some extent, we can observe that external factors (competition, regulation and other environmental factors) are endogenously related to internal factors as well. That is why feedback theories account for last year's organizational outcomes as a key influencer forming managers' strategic intentions (Kaleka and Morgan 2019).

This paper deals with the population of new-to-the-market innovators and tries to contribute to the debate about the complex relationship between capability factors and business performance. New-to-the-market marketing innovations are not common in the Czech economy. Companies usually innovate their product or service or improve the production process and subsequent methods of the traditional marketing mix (product, price, place and promotion).

That is why this issue is worth exploring. The sample of Czech manufacturing enterprises guarantees representativeness of product exporters and, given the high ratio of foreign-owned enterprises in the Czech economy, we also critically studied multinationals. The originality is in using the CDM modeling approach (named after economists Crépon, Duguet and Mairesse) for marketing innovations (see Lööf et al. 2017 for further CDM best practices and contributions). This model deals to some extent with the endogeneity of the financial and innovation output variables and the selection bias.

Marketing innovations follow the logic of general marketing mix processes (product, price, place and promotion), include Industry 4.0 technologies like the Internet of Things and require knowledge-intensive services like Automatization and Artificial Intelligence. Marketing innovation requires skilled labor and mature management to process data as well as information about customers in today's smart digital era. Their preferences underpin the companies' smart marketing innovations, such as mobile applications, information technologies in addition to systems, new ways of delivery, and pricing.

The goal of this paper is to analyze the characteristics of new-to-the-market innovators as well as their marketing innovation activities with respect to market orientation factors (distance). The research questions are: what is the relationship between marketing innovations and distance-based types of

market orientation? What is the role of other innovation strategies? Are the results dependent on the type of the economy or comparable to other studies? The purpose is to entangle the complex relationships of the marketing innovation activities of product innovators and contribute to the debate about marketing capabilities in the manufacturing industry-oriented export activities.

## 2. Literature Review

Current research dealing with marketing innovation is aimed at the linkages between the marketing capabilities and competitiveness of small and medium-sized enterprises (SMEs). Marketing innovation is highly important in the “reseller industry” and retail trade in general. There is a relationship between the two types of competitiveness: brand and reseller enterprise. Marketing innovations from a brand enterprise are highly influenced by the competition in the market and not by the reseller enterprise (Gupta et al. 2016).

The debate is also about a certain divide between marketing innovation and technological innovation. Is there a dis-synergistic effect or does it depend on the industry? What type of complementarity (and endogeneity) are we speaking about? The dual innovation strategy was found to be a better concept in Germany in 2008 in a sample of enterprises of different sizes and industries (Grimpe et al. 2017).

There is a quite high failure rate in marketing innovation projects regarding the implementation of customer relationship management (CRM) information systems. Without appropriate knowledge about management processes, failure is imminent because managers must be able to get information and knowledge from the customer data (Garrido-Moreno et al. 2015) and have the appropriate infrastructure (hardware, software, etc.).

The learning capability of employees and subsequent marketing innovations contribute to the higher financial performance of hotel enterprises (Nieves and Diaz-Meneses 2016) which are not considered as high-intensive knowledge industries in comparison to the health or ICT industry. Skill-intensity is an indicator of a good level of knowledge management practices. Innovation activities (product and marketing) of skill-intensive enterprises generate higher productivity growth. Innovation-fostering programs and public support programs should aim at skill-intensive enterprises with the proper level of knowledge management (Junge et al. 2016).

Similarly, in the agri-food industry in Canada, market scanning (and subsequent knowledge management techniques) and competitive pressures contribute to technological and marketing innovation activities (Mirzaei et al. 2016). Information from competitors, suppliers and customers leads to marketing innovation. External knowledge management is a prerequisite to innovation activities in the manufacturing industry in Spain (Javier Ramirez et al. 2018).

Macroeconomic variables can influence marketing innovation activities as well. The result suggests that marketing innovations are driven by aggregate demand and demand from abroad. The Spanish enterprises that introduced marketing innovations were those that exported to countries outside the European Union. There was a general decline (more than half) in marketing innovation activities after 2008 in Spain (Medrano and Olarte-Pascual 2016). Enterprises in creative industries (fashion, style, architecture, design, industrial patterns, etc.) set the trends, and their innovation activities affect global markets. However, cultural antinomies play an important role in the global fashion paradigm as well (Khaire and Hall 2016).

Global economic networks and global value chain companies are the bearers of marketing innovation. Knowledge of these flexible companies includes know-how about institutions and market channels, while every member or contractor is important. Intensifying globalization and the recognition of knowledge in modern economies have led to an uncertain world. Economic leaders and so-called ‘go-between leaders’ are needed to navigate the global markets. The first one conducts an innovation strategy, while ‘go-betweeners’ manage the producing and selling strategy (Baulant 2015). Sustainable production practices are associated with globalization and integration

into an enterprise-wide manufacturing network. Sustainable sourcing practices are associated with integration into the external supply chain (Golini and Gualandris 2018).

To summarize the contribution of current knowledge, the bivariate (or multivariate) specification (a simultaneous model) has to be considered in marketing innovation research. This is because a weaker effect of marketing innovation activities was found in the product innovation equation. This means that marketing innovations benefit from product innovation activities (Bartoloni and Baussola 2016). That is why this paper uses the bivariate equation in the innovation output stage of the innovation business process and adds as many reasonable control variables as possible to account for industry-specific factors. The relationship of internal factors is naturally endogenous. There is feedback based on the enterprise's past and endogenous relationship with many factors from the external environment. New-to-the-market innovators are a relatively homogenous group of capable enterprises in comparison to non-innovators. The role of strategies, market orientation factors and other characteristics can be tested in this unique sample located in the small export-oriented economy.

### 3. Materials and Methods

The 2014 wave of the Czech Community Innovation Survey (CIS)<sup>1</sup> served as the dataset for the analysis (3015 observations). Only enterprises from the manufacturing industry were selected for the final sample. There are no service or trade enterprises in the sample. For the purpose of the estimation procedure, financial variables (in thousands of CZK) are per one full-time employee and logarithmically transformed. A total of 22% of manufacturing enterprises innovated their goods and services between 2012 and 2014. The descriptive statistics about sales and the number of employees suggest a very heterogeneous sample (Table 1).

**Table 1.** The summary of statistics from the sample of manufacturing enterprises in 2014.

Variable	Obs.	Mean	Std. dev.	Min	Max
New-to-the-market innovator	3015	0.22	0.41	0	1
Sales	3015	$9.80 \times 10^5$	$7.04 \times 10^6$	512	$2.97 \times 10^8$
Number of employees	3015	208.59	638.47	10	24,354

Four types of marketing innovation are recognized: a new design (Design), a new promotion method (Promotion), a new product selling and placing method (Placing), and a new product pricing method (Pricing). Marketing innovator (59%) is an enterprise that introduced new-to-the-market innovation and one of the four marketing innovations (Table 2).

**Table 2.** The summary of statistics from the sub-sample of new-to-the-market innovators in 2014.

Variable	Obs.	Mean	Std. dev.	Min	Max
Number of employees	641	418.80	1165.82	10	24,354
R&D expenditures	641	$6.31 \times 10^4$	$6.05 \times 10^5$	5	$1.51 \times 10^7$
Marketing innovation	641	0.59	0.49	0	1
Manufacturing process innovator	641	0.65	0.48	0	1
Sales of new-to-the-market innovations	641	635,463.7	5,934,088	109.35	$1.40 \times 10^8$

Eurostat technological level control variables were introduced to control for long-term industry R&D differences (Eurostat 2016). Almost all enterprises (97%) were product innovators, so it does not

<sup>1</sup> Community Innovation Survey datasets for Czech Republic are accessible for scientific purposes through the "safe center" procedure at Czech statistical office.

make sense to estimate the bivariate structural model of product and marketing innovation equation. Instead of the product innovation equation, we used the manufacturing process innovation equation.

For estimation, we used recommendations for cross-sectional datasets (Mairesse and Mohnen 2010) and followed the stage logic of innovation as a business process (Table 3). The term innovator is rather narrowly described as an enterprise that is identified as having non-zero R&D expenditures that introduced a new-to-the-market innovation in the last three years (from the 2014 Community Innovation Survey).

**Table 3.** Innovation model used for estimation.

Dependent	Model Description	Equation Number
New-to-the-market innovator (Probit)	$\begin{cases} r_i^* = 1 \text{ if } r_i = (X_{1i}\beta_1 + \varepsilon_{i_1}) > 0 \\ r_i^* = 0 \text{ if } r_i \leq 0 \end{cases}$	(1)
R&D expenditures per employee (ln)	$k_i^* = \ln(k_i)   (r_i > 0) = X_{2i}\beta_2 + \varepsilon_{i_2}$	(2)
Sales of new-to-the-market innovations per employee (ln)	$t_i^* = \ln(t_i)   (k_i > 0) = X_{3i}\beta_3 + \alpha k_i^* + \varepsilon_{i_3}$	(3)
Marketing and Manufacturing process innovations (bivariate Probit)	$\begin{cases} manproc_i^* \begin{cases} 1 \text{ if } manproc_i = (\rho \hat{k}_i^* + X_{4i}\beta_4 + \varepsilon_{i_4}) > 0 \\ 0 \text{ otherwise } (manproc_i \leq 0) \end{cases} \\ marketing_i^* \begin{cases} 1 \text{ if } marketing_i = (\sigma \hat{k}_i^* + X_{5i}\beta_5 + \varepsilon_{i_5}) > 0 \\ 0 \text{ otherwise } (marketing_i \leq 0) \end{cases} \end{cases}$	(4)

The first two dependent variables are estimated using the logic of the Heckman procedure. We used marginal effect Probit estimation and ordinary least-squared regression with Mill's ratio. The  $X_{ni}\beta_n$ 's (with  $n = 1, 2, 3, 4$  and  $5$ ) are vectors of explanatory variables; every equation has a unique set of control variables (market orientation, innovation strategy variables, public support variables, training expenditures, cooperation, etc.). The  $\varepsilon_{in}$ 's (with  $n = 1, 2, 3, 4$  and  $5$ ) are random-error terms. The vector of parameters to be estimated is denoted  $\beta_n$ 's (with  $n = 1, 2, 3, 4$  and  $5$ ). Sales of new-to-the-market innovations per employee are estimated using ordinary least-squared regression. The last two-equation model is estimated using the bivariate Probit procedure. The first equation is identified uniquely by machinery acquisition expenditures and training expenditures, which are necessary for new manufacturing methods and less important for marketing innovations in the manufacturing industry. Also, the latent innovation intensity variable  $\hat{k}_i^*$  (linear prediction of Equation (2)) is used instead of real R&D expenditures.

#### 4. Results

The orientation to world markets and facing of global competitors is not related to a higher probability to introduce marketing innovation in the sample of new-to-the-market innovators in the Czech manufacturing industry. On the other hand, marketing innovation was driven by the strategy of the enterprise to unlock hidden demand with innovation activities and the entry to new geographical markets. It was less probable in multinational companies (foreign ownership > 50%) and enterprises that mainly operate in European markets (Table 4) in comparison to the local, market-oriented enterprise.

There is a simultaneity between marketing innovation activities and manufacturing process innovation, as one supports the other in the manufacturing industry. Design innovation contributed to higher R&D expenditures per employee and promotion to fewer R&D expenditures. There is no additional effect on the sales of innovated goods and services of all types of marketing innovation (Table 5). The business performance of new-to-the-market innovators in the manufacturing industry is dependent on a complex mix of many R&D expenditures allocated to more types of innovation activities (product, process, logistics, organizational, marketing and environmental innovation).

**Table 4.** The bivariate Probit model of marketing and manufacturing process innovations.

Variable	Marketing Innovation	Manufacturing Process Innovation
Number of employees	0.094 ** (0.05)	−0.424 ** (0.11)
National markets	−0.065 (0.23)	0.325 ** (0.14)
European markets	−0.402 * (0.23)	−0.284 * (0.14)
World markets	−0.374 (0.27)	0.180 (0.17)
Foreign ownership	−0.436 *** (0.13)	-
Control variables	Being part of a group, latent R&D and innovation strategies.	Being part of a group, latent R&D and machinery expenditures.
Constant	−0.710 * (0.39)	2.205 *** (0.38)
Number of observations	637	637

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , robust standard errors in parentheses.

**Table 5.** The decision to innovate, R&D expenditures and sales of innovated goods intensity.

Variable	Decision to Innovate (Marginal Effects)	R&D Expenditures	Sales of Innovated Goods and Services
Number of employees	0.068 *** (0.01)	−0.424 ** (0.11)	−0.020 (0.05)
Marketing innovation–Design	-	0.325 ** (0.14)	−0.047 (0.12)
Marketing innovation–Promotion	-	−0.284 * (0.14)	−0.178 (0.13)
Marketing innovation–Placing	-	0.180 (0.17)	−0.082 (0.14)
Marketing innovation–Pricing	-	−0.126 (0.25)	−0.088 (0.18)
Control variables	Technological levels, foreign ownership, market orientation, being part of a group.	Foreign ownership, Mill's ratio, funding variables, cooperation, being part of a group.	Foreign ownership, the log of R&D expenditures per employee, innovation strategies, being part of a group.
Constant	-	5.834 *** (1.04)	5.09 *** (0.31)
Number of observations	2978	637	637

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , robust standard errors in parentheses.

## 5. Discussion

The relationship between marketing innovations and focus on distant markets is not straightforward in the Czech manufacturing industry. Results from a 2014 survey of 3015 enterprises suggest that world market orientation contributes to the decision to engage in all types of innovative activities through the R&D expenditure channel. This means that we did not find a direct relationship between marketing innovation and orientation to more distant markets.

All the new-to-the-market innovators were predominantly product innovators (97%) and marketing innovation was introduced only in about 59% of enterprises. Marketing innovation complements innovative activity among manufacturing companies and their product innovation. The simultaneity is between manufacturing process innovation and marketing innovation. This means that the dual innovation strategy is, to some extent, present in the Czech Republic (see [Grimpe et al. 2017](#)) and the effects of marketing innovation activities aim at different time frames.

Marketing innovation activities (design, promotion, placing and pricing activities) had no additional effect on the sales of innovated goods and services in the manufacturing industry.

The introduction of a new product design was in a positive relationship with R&D expenditures. Design projects are R&D-intensive and the effect on sales of innovated goods and services was only through total R&D expenditures per employee variable (innovation input/output ratio). The effect was short-term.

Promotional marketing innovation activities negatively affected R&D expenditures. Similar to the case of design innovations, promotional activities can get very expensive in the manufacturing sector and the channel of R&D expenditures (innovation input/output ratio) lowers the sales of innovated goods and services. However, we know that the current and future effects of past promotional marketing innovation activities are expected to be positive. The effect seems to be medium-term.

The results also confirm that the relationship between marketing capabilities is complex and some activities had a negative impact on the present financial performance but are expected to have positive performance in the future. This supports the feedback theories (Kaleka and Morgan 2019). As discussed by Mairesse and Mohnen (2010), there are many issues with the endogeneity of variables and their effect comparability across industries.

In terms of global competitive pressures, foreign-owned companies (multinational enterprises) have a lower probability of introducing marketing innovation than local enterprises. One of the explanations for this is that the strategic intentions are heavily aimed at integration into the global supply chain, whereas marketing innovations are managed and sourced by other entities (Baulant 2015; Golini and Gualandris 2018).

Marketing innovation was motivated by the strategy of the enterprise to uncover as well as analyze hidden demand, and the entry to new geographical markets. This strategy seems typical for new-to-the-market innovators from the manufacturing industry. Further research can explore differences between the “reseller industry” (highly intensive in marketing innovation activities Gupta et al. 2016), knowledge high-intensive non-ICT (rather oriented at the national market), ICT service industries (rather oriented at international markets) and the manufacturing sector.

“Quality culture” is one of the adaption factors to Industry 4.0 and in Slovak manufacturing enterprises. Assurance of quality is a successful innovation approach that can uncover hidden demand, and it was detected in the Slovak manufacturing (Durana et al. 2019). This adaptation (new-to-the firm innovation) seems to influence the marketing innovations of the manufacturing enterprises.

Further research should deal with the issue of a global consumer culture (Steenkamp 2019) and other factors of accelerated (de)globalization tendencies (Witt 2019) and their impact on promotional marketing innovation activities. These further managerial and business economics research questions should be approached from a social science interdisciplinary perspective (sociology, economics, economic history) to account for past dependence, and the endogeneity of a change in the external socio-economic environment.

The research in this paper is limited by the methodology of innovation process econometric modeling. Most of the known issues are dealt with to some extent by including the manufacturing industry only. The results represent small and medium-sized enterprises in addition to large enterprises, but the dynamics of micro-enterprises as well as sole-traders are missing.

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