

Do the Export Intensity and Technological Advancement of Firms Matter for Their Innovation Objectives? Evidence from Poland

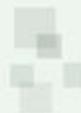
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Agenda

- Theoretical background
- Research questions
- Sample, methods applied
- Research outcomes
- Policy implications



Theoretical background

Innovation is claimed not to be an exclusive technological effort, but a strategic, market-driven perspective (e.g. Bessant & Tidd, 2007; Terziovski, 2010) in which **technological and management activities complementary support each other** (Damanpour & Evan, 1984; Damanpour, 1987).



Theoretical background (cont.)

- Innovation is one of the most important drivers and sources of firms' competitiveness (e.g. Burns and Stalker, 1961; Kay, 1993; Utterback, 1994; Higgins, 1996; Besanko et al. 2007).
- Innovation in each arena of business activities and at each stage of value creation can become an important source of competitive advantage based both on cost advantage and on differentiation (Porter, 1985; Best, 2009).

Defining innovation objectives

- The concept of innovation objectives includes both an outcome and the process to reach this outcome (Damanpour, 1991; Dougherty, 1992; Obstfeld, 2005).
- Oslo Manual (2005) distinguishes between innovation objectives, which concern firm's motives for innovating, and effects - actual observed outcomes of innovation.
- **In our view the innovation objectives are the required (expected and unexpected) outcomes – direct, declared or actual observed effects of innovative activities.**

Setting of innovation objectives

- A critical issue is how to achieve a consistency of objectives' system both vertically (i.e. keeping appropriate hierarchy of objectives) and horizontally (i.e. defining relationships among objectives to be achieved by each unit of a firm) (Griffin 1999; Holmes and Moir 2007; Quintane et al. 2011).



Setting of innovation objectives (cont.)

The outcomes of innovation activities are the vehicles to achieve strategic business and social objectives of the organization, such as:

- increasing the resource/competence base of the firm;
- gaining and maintaining competitive advantage (necessary to increase sales, open up and enter new markets, increase market share);
- improving corporate image and relationships to firm's stakeholders.

Research questions

RQ 1. What are the specific dimensions of innovation objectives?

RQ 2. Does firms' export intensity matter for the hierarchy of innovation objectives?

RQ 3. Does firms' technological advancement matter for the hierarchy of innovation objectives?

Data

- The data is based on the Polish wave of the Community Innovation Survey (CIS) for 2008-2010.
- The sample (**N=7783**) consists of Polish medium- and big sized enterprises from NACE section B; C; D and E.
- We analysed **n=3588** firms that in the given period introduced at least one type of innovation (process, product, marketing or organizational innovation).



Data

The whole sample of firms is divided into three groups:

- **Firms focused on domestic market, n=796**
- **Firms oriented on both domestic and foreign markets, n=1525**
- **Firms focused on foreign markets, n=1267**

At this point we assume that the last firms' category represents the most intensive exporters.



Data

Chi-square with column proportions was applied to verify statistically significant differences between groups of innovative firms with different market focus ($p < 0.05$).

We revealed that there exist statistically significant differences in those groups' characteristics.



Firms' categories

Sample characteristics		Firms' market focus					
		Domestic market <i>n</i> =796		Domestic-foreign <i>n</i> =1525		Foreign markets <i>n</i> =1267	
		n	%	n	%	N	%
Introduction of product innovation		303	38.1c*	1052	69a	700	55.2b
Introduction of process innovation		442	55.5b	992	65a	735	58b
Introduction of marketing innovation		341	42.8c	616	48.6b	850	55.7a
Organizational innovation		268	33.7b	748	49a	493	38.9b
Firms size	Medium	636	79.9a	929	60.9b	960	75.8a
	Large	160	20.1b	596	39.1a	307	24.2b
Technology level	Not classified	315	39.6a	17	1.1b	35	2.8b
	Low technology	229	28.8b	454	29.8b	487	38.4a
	Medium technology	233	29.3c	984	64.5a	698	55.1b
	High technology	19	2.4a	70	4.6a	47	3.7a
Capital group	Polish capital group	145	18.2a	290	19a	131	10.3b
	Foreign capital group	65	8.2b	394	25.8a	298	23.5a
	Independent firm	586	73.6a	841	55.1c	838	66.1b

Each subscript letter denotes a subset of cluster categories whose column proportions (Bonferroni method) do not differ significantly from each other at the .05 level.

Method

RQ 1: Exploratory factor analysis (Varimax rotation) was applied to explore the data and to determine the number and the nature of underlying factors that explain the correlations among a set of variables.



Rotated Component Matrix^a

Innovation objectives	Factor			
	Process and CSR innovation objectives	Organizational innovation objectives	Product innovation objectives	Marketing innovation objectives
Improve safety and hygienic of workplace	.808			
Reduce consumption of materials and energy	.771			
Reduce environmental impacts or improve health and safety	.757			
Reduce unit labour costs	.750			
Improve flexibility of production or service provision	.626			
Increase capacity of production or service provision	.624			
Improve quality of goods and services (as organizational innovation outcome)		.731		
Improve flexibility of production or service provision (as org. inn. outcome)		.722		
Reduced time to respond to customer needs (as org. inn. outcome)		.714		
Reduce costs per production unit (as organizational innovation outcome)		.688		
Improve communication among business activities (as org. inn. outcome)		.656		
Increase range of goods and services			.792	
Enter new markets			.713	
Improve quality of goods and services			.554	
Introduce products for new segment of customers (as marketing inn. outcome)				.785
Enter new markets (as marketing innovation outcome)				.780
Increase or maintain market share (as marketing innovation outcome)				.711

Extraction Method: Principal Component Analysis. ^a. Rotation converged in 5 iterations.

Research outcomes (1)

In the factor analysis the following underlying factors explaining innovation objectives were distinguished:

- “process and CSR related innovation objectives”;
- “organizational innovation objectives”;
- “product innovation related objectives” and
- “marketing innovation objectives”.

Method

RQ 2 and RQ 3:

Linear Model Univariate Analysis with Bonferroni post hoc was used in order to verify statistically significant differences in innovation objectives importance for firms characterised by varying export intensity and technological advancement.



Innovation objectives hierarchy, by firms' export intensity

Objective / market focus		Mean	n
Organizational innovation objectives	Firms focused on domestic market	2.92c	341
	Firms focused on foreign markets	3.06b	616
	Firms oriented on both domestic and foreign markets	3.16a	850
Marketing innovation objectives	Firms focused on domestic market	2.69c	268
	Firms focused on foreign markets	2.90b	493
	Firms oriented on both domestic and foreign markets	3.15a	748
Product innovation objectives	Firms focused on domestic market	1.68c	605
	Firms focused on foreign markets	2.09b	988
	Firms oriented on both domestic and foreign markets	2.33a	1307
Process and CSR innovation objectives	Firms focused on domestic market	1.52b	605
	Firms focused on foreign markets	1.63b	988
	Firms oriented on both domestic and foreign markets	1.83a	1307

Research outcomes (RQ 2)

- Type of firms' major target market does not affect the hierarchy of importance of innovation objectives.
- Hierarchy of importance of innovation objectives is the following:
 1. Organizational innovation
 2. Marketing innovation
 3. Product innovation
 4. Process innovation

Innovation objectives hierarchy, by firms' technological advancement

Objective / technological advancement		Mean	n
Organizational innovation objectives	Low technology	3.05a	511
	Medium technology	3.13a	1021
	High technology	3.03a	83
Marketing innovation objectives	Low technology	2.93a	562
	Medium technology	3.06a	769
	High technology	3.09a	72
Product innovation objectives	Low technology	2.06b	869
	Medium technology	2.25a	1622
	High technology	2.36a	124
Process and CSR innovation objectives	Low technology	1.60a	869
	Medium technology	1.78a	1622
	High technology	1.61a	124

Research outcomes (RQ 3)

- Differences in technological advancement of firms do not influence significantly the declarations of objectives' importance of particular types of innovation, except for product innovations.
- Product innovation objectives' importance increases with growing technological advancement of firms.

Research outcomes - a summary

- The higher importance ascribed to organisational and marketing innovations as compared to technological innovations, independently from main target market and technological advancement, shows that non-technological innovations are perceived as significant drivers of firms' competitiveness.
- Due to lower capital intensity of non-technological innovations this attitude can be viewed as a symptom of rationality of firms' behaviour in the context of their resource limitations, which discourage them from costly technological innovations.

Research outcomes - a summary

- It is to note, that this solution is suitable especially in “traditional” low- and medium-tech industries (that dominate in Polish economy), where R&D and product innovation are less effective source of competitive advantage than in high-tech industries.



Policy implications (1)

- Innovation support measures in the EU are mostly designed to support product innovation in R&D intensive sectors.
- To increase the still considerable contribution to nation's competitiveness of firms in traditional manufacturing industries (usually low-and medium- tech), a broader innovation policy mix is more appropriate.

Policy implications (2)

- We argue that innovation policy should take into account the importance of non-technological (organisational and marketing) innovation which are of particular importance in traditional manufacturing industries and
- Should encourage innovative or potentially innovative firms to more fully exploit their potential based on non-technological innovation.



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