

## INTANGIBLE INVESTMENT IN RESOURCE LIMITED ENVIRONMENT, CORPORATE GOVERNANCE<sup>1</sup>

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### Abstract

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*The paper studies corporate governance characteristics in a panel of transition countries to investigate the relationship between the investment in intangible capital (specifically innovation) and corporate governance. We show that innovation is restricted by finance and the managerial attitude towards activities that support innovation. In case of financial restriction, softer innovation (process, marketing, organization) are more less impacted by the restriction and are also more common. Lack of managerial support to innovation results in less innovation, regardless of the type. We also show that external determinants, like the intensity of competition and international orientation, are related to innovation. The paper extends the knowledge about the link between corporate governance and intangible investment at large and in particular in transition countries. As such it provides useful implication at microeconomic as well as macroeconomic (developmental) level.*

**Keywords:** *intangible capital, innovation, managerial attitude, corporate governance, transition countries*

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### 1. INTRODUCTION

Economic growth and development in transition countries has been after the initial downturn in the early 1990s, which in some countries led to a cumulative loss of GDP of even 60%, quite remarkable. The catch-up process was marked by growth rates which often rose to almost double digit numbers and in some cases even surpassed the 10% mark. Among EU members, primarily the Baltic states before the crisis and Slovakia reached beyond

the 10% mark (Eurostat, 2016). Although the fast growth was accompanied by increasing productivity, productivity growth was lagging behind GDP growth, indicating that a significant share of this growth (up to half in some years and countries, Eurostat, 2016) was in fact extensive.

Innovation is the key to productivity rise. Increasing value added may arise from product, process, market or organizational innovation (OECD, 2005). Innovation is a buzz-word in many policy documents at both EU and national level (for example

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1 This paper presents selected preliminary findings related to the role of corporate governance and innovation supporting activities as well as financial constraints to innovation in transition countries. Detailed results are presented in a paper (Financial constraints and corporate behaviour in transition countries, Redek and Trajkovski, 2016).

H2020, EC, 2016, Smart specialization strategy, 2015, and other), but often policy documents overlook an important fact – that innovation takes place at firm level. The decision to innovate, to devote scarce resources to innovative activities with often uncertain outcome results from firms' strategic orientation and the drive to improve overall performance, including productivity.

The awareness of the importance of innovation in transition countries is intensifying, firms are introducing new products, modernizing processes, implementing new organizational practices and numerous marketing innovations (EBRD, 2014). Moreover, firms, which are closely linked to international markets are intensely learning and adopting as well as adapting the "transferred" knowledge to their firms. And this knowledge acquisition, characteristic of the open innovation model (Chesbrough, 2003, Redek and Farčnik, 2015) is especially strong in firms competing in the most demanding global markets (Prašnikar et al., 2016). But according to the EBRD (2014) although many firms are introducing innovations, only a small share of them represent also novelties in the international arena. While adoption of existing technologies is popular, the fact that little effort is on average invested into "creating own knowledge" suggests that a significant room for improvement and enhanced catch-up process exists.

Evidence suggests that a number of factors affect the inclination of firms towards innovation, resources play a major role. Among resources, both financial (capital) as well as human resources matter. Empirical research shows that the lack of resources significantly stifles innovation (Nohria and Gulati, 1996). On the other hand, the lack of resources also changes the nature of innovation. Namely, due to the lack of resources, firms turn to more incremental innovation and focus rather on design and development than on research (Forbes and Wield, 2000). Therefore, firms commonly implement process innovation, market and organizational innovation. Although resource-wise less demanding, these innovations often represent a significant contribution to overall productivity.

But resources are not sufficient condition for innovation. Managerial attitudes, corporate strategies or corporate governance in the broadest sense has

a major impact on innovation. Corporate governance broadly refers to how firms are run. Good corporate governance, which is expected to enhance value and ensure efficiency as well as accountability, refers to a network of explicit and implicit relationships and rules, that describe the distribution of responsibilities within the firm, between the firm and the owners, the mechanism of control (OECD, 2009), and is expected to increase firm value. Innovation, value added increase and productivity growth largely depend on the support of corporate governance to value-enhancing activities. Corporate strategies, attitudes towards innovation and the strategic role of innovation are consequently also extremely important (Redek et al., 2010, Prašnikar et al., 2016) factors determining the level of innovation intensity. At the moment, the knowledge about the role of resources and managerial attitudes for innovation activity is weak.

The purpose of this paper is to broaden the knowledge in this area. The purpose of this paper is consequently to investigate, how the availability of resources and managerial attitudes as well as corporate governance are linked to innovative activities in transition economies. Besides studying the nature of innovation at large, we focus primarily also on the question of how the role of management changes in case of resource constraints. Relying on the Business environment and enterprise survey 2012-2014, which studies different aspects of firm behaviour and performance in relation to institutional setting as well as internal firm characteristics, we show, that managerial attitudes are strongly linked to the innovation characteristics and that firms with resource constraints do in fact behave differently and that managerial support to innovation in such firms is crucial.

The paper makes several original contributions to the literature. First, the paper extends the literature on innovation activity, intangible capital (where innovative property represents a significant proportion) by focusing on the role of resource constraints and managerial attitudes. Second, the paper contributes to the limited literature on innovation in resource restricted environment by providing an empirical view on the issue. Third, the paper extends the literature by the application of the problem to transition countries and deepens the

understanding of the nature of innovation in these countries as well as the role of resource constraints and managerial attitudes.

## **2. THEORETICAL BACKGROUND**

Innovation according to the Oslo Manual (2005) and the Frascati Manual (2002) to improvements in the products, processes, marketing and organization. Product innovation refers to every significant improvement of the product with regards to technical specification, components, materials, incorporated software or other functional characteristic are considered as distinctive subtype of product innovation. Significant improvements of the production process like production techniques, equipment or software, improvements in delivery methods like logistics, allocation of supplies within the firm or delivering final product, improvements in auxiliary support activities like accounting, maintenance, computer costs, purchasing are recognized as distinctive subtypes of process innovation. Marketing innovation comprise better addressing of customer's needs, opening new markets, newly positioning a firm's product on the market, product design, product placement, product promotion, product pricing. Organizational innovation refers to the implementation of a new organizational method in the firms, while this category is further divided into implementing of new business practices, new methods for distributing responsibilities, new methods for decision making, new methods for division of work, new concepts for structuring of activities and establishing new external relations.

### **2.1 Differences in innovation activity between developing and developed economies**

Generally, firms are driven to innovate; their strategic orientation forces them to invest in product and process innovation, where this can be more or less radical. Investment into innovative capital can lower costs, increase value added, strengthen their market position (Utterback & Abernathy, 1975) and even help firms establish themselves as leaders at the market (Porter, 1995). While radical innovation is a major source of competitive advantage and long-term survival for firms (Chandy & Tellis, 1997),

any innovative capital investment helps firms build competitive strength. When new firms with novel ideas enter the market and unproductive firms cease to operate, scarce resources are put to more productive use (Katilia, 2005; Nohria and Gulati, 1996).

While innovation is extremely important in all countries, the nature of innovation differs between developing and developed economies. In the developed economies, the innovative activities are essential to future growth and productivity increase (e.g. VanArk et al., 2009), the majority of growth is namely intensive (see Snowden, 2006). The developed economies are also the economies that define the technological frontier and move it forward, which among the other elements includes product invention, and also commercially correct definition of the innovation and related activities that enable the firm to reap benefits from the new product (Forbes and Wield, 2000). Overall, the developed economies account for 94.7 % of global R&D expenditure (2014 Global R&D Forecast, 2013).

The innovative task in technology-follower firms and countries is not less difficult but it is different (Forbes and Wield, 2000). First of all, the future is for the developing countries already shaped (Forbes and Wield, 2000). Firms in developing countries are informed, and directly affected by the technology used in developed countries. Technology, methods, knowledge and processes are observed, adopted and adapted (Kim, 1997). The risk of uncertainty with implementing new technologies, processes, organization or marketing approaches is significantly lower and the impact of "imported" knowledge is significant. Also the effect from the implemented improvement can be predicted more precisely (Rosenberg, 1996).

### **2.2 Innovation inputs**

But the processes of adoption of foreign technology and adaptation of existing technologies and products to local as well as development via (often incremental) innovation nonetheless require a significant amount of inputs and primarily also domestically available technology learning capabilities, including absorption capabilities. Moreover, it is essential that the firm to recognize the value of new,

external information, assimilate it, and apply it to commercial ends is crucial to its innovative capabilities. Firm's absorptive capacities are largely a function of the firm's level of prior related knowledge (Cohen & Leventhal 1990) and the strategic orientation of the firm related to its competitiveness goals (Prašnikar et al., 2016, Nelson and Winter, 1982, Delgado et al., 2012).

Regarding the role of the resource limitation, several points must be made. First, due to a different nature of the innovation process, firms from developing countries allocate their resources differently regarding innovation and the structure of innovation (product, process, organizational, etc.). Firms are more inclined to incremental innovation (Forbes and Wield, 2000) than radical, which is caused both by a lack of financial and human resources. Innovations in developing countries are often also more incremental and more process oriented, due to the lack of resources, not just financial. Not only are their internal resources limited, but also external funding is hard to obtain (Hall, 2002). New products and processes in developing countries are mostly a result of in-house R&D (Transition Report, 2014) and the adoption of complex technology is delayed until they obtain sufficient technical know-how to implement and operate it successfully (Attewell, 1992). Other innovation types, primarily process innovation, organizational innovation or marketing innovation are also extremely important to boost productivity without significant financial requirements. In these cases, also learning and "knowledge absorption" from the outside (or inbound open innovation activities, Chesbrough, 2003) are very important and are related to much lower resource requirements. In general, the literature stresses a number of innovation determinants, from demographic (size, age, ownership of firms, etc.) to market (trade in foreign market, business environment) and firm-specific (innovation input – primarily financial (e.g. R&D), human resources, ICT and other) (see Transition Report, 2014, for overview).

Furthermore, improvements, as a result of cumulative learning, in production process, working organizations, delivery can be successfully implemented. Subtypes, such as significant improvements in production via software implementing and

accumulated external techniques, improvements in logistics and delivering final product, maintaining of the equipment, are very important. Also subtypes from marketing innovation, such as better understanding the customer needs or opening new markets, can be efficiently used in resource limited environment. Organizational subtypes of innovation that can improve the competences force of the firms are improvement of business practices, new methods of distributing responsibilities or decision making or division of work are similarly very efficient. The finance needed to fund such an innovation strategy are significantly lower and the risk from unknown outcomes is reduced (Fleming, 2001).

### **2.3 Firm attitude towards innovation**

In resource limited environment it is also very important to have a suitable organizational climate and managerial support to innovation, in order to maximize the output obtained from the limited resources. Attitudinal factors like, intention, inspiration, integration and identification act as catalysts for successful innovation when resources are limited (Bicen & Johnson, 2014). In this aspect, corporate governance, strategic management and corporate management literature stresses the linkages between firm orientation and innovation. At the level of corporate governance, according to O'Sullivan (1998) the system of corporate governance should generate conditions which support the "commitment of resources to investments with uncertain returns", the use of resources in the process of innovation and vesting control to those that have the abilities and incentives to allocate resources to innovation related activities. The allocation of resources that O'Sullivan discusses is also linked closely to the strategic management discussions of innovation. For example, according to Ali et al. (2008) the availability of suitable executives often causes the companies to develop a suitable infrastructure to assimilate the technology or develop own technology. Trembalay (2004) stresses the link between acknowledging the "economic role" of innovation in firms, appropriate resource allocation and the role of learning and strategic orientation of firms. Similarly, also Aubert (2004) in his discussion about the policy support to innovation at national



level stresses also the importance of the support at the micro level for enterprise upgrading, which supports the Ali et al. (2009) discussion. The discussion is also in line with Penrose (1959), who showed that the key role of the management team is to use the knowledge of the firm and market to define and shape expansion paths that transform firm's resources into profitable growth trajectories. As Klein and Knight (2005) claimed the successful implementation of innovation above all requires learning orientation, positive innovation climate or general attitude towards innovation and management support (where the first two factors also depend on management support). Often, the lack of ambition is one of the key differences between very innovative and "average, follower" companies even in developing economies. Analysing resource limited innovation, consequently; inevitably lead us to the personal characteristics of the manager, their skills, traits and vision for the future development, which was shown to be extremely important also in innovative behaviour of Slovenian, Bosnian and Albanian companies (Prašnikar, ed., 2010, Prašnikar et al., 2016, Prašnikar and Knežević Cvelbar, 2012, Prašnikar et al., 2012).

The paper focuses on transition economies, which represent at the moment (even for the EU members) still a group of catching-up economies. To understand and in the subsequent section discuss the innovation in catch-up economies, we shall first examine the characteristics of innovation in transition countries. Given the discussion above, the innovation activity in transition countries can be expected to be different, primarily do to the catch-up nature less radical and more oriented into process, market and organizational innovation. Since the literature stresses the importance of various determinants of innovation (from demographic to external as well as, naturally internal, including human and financial), we expect to identify a link between the innovation activity and resource availability. Since the availability of resources is linked also the firm specific determinants, that can be linked to various managerial aspects, we believe that managerial attitude will also be identified as a determinant of innovation.

### 3. DATA AND METHODOLOGY

The paper will be guided by the following research questions: (1) What is the general innovation activity in transition countries? (2) What is the relationship between financial constraints and innovation (including types of innovation)? (3) What is managerial attitude towards innovation?

The analysis relies on the Business environment and enterprise performance survey, conducted by the EBRD. We use the 2012-2014 round V data, which included in total 15,883 enterprises in 30 economies<sup>2</sup>. The BEEPS V round included also a special innovation module which studied the nature of product, process, organizational and marketing innovation.

#### 3.1 Data

In continuing, we first briefly present the questionnaire. The questionnaire is available from the EBRD web-page and so are the data. The detailed questionnaire first resolves the issues regarding the general and control firm information (such as industry, size, employment, management, etc.), followed by a detailed survey regarding the business environment characteristics (infrastructure and services, sales and supplies, degree of competition, innovation, capacity, land and permits, crime, finance, business-government relations, labour, use of consulting services, bribery, business environment, performance, expectations, and perceptions of obstacles. The questionnaires are primarily formed as either Yes/No, Likert scale questions or "select one answer" questions.

The sample comprised just under 16 thousand companies, which were predominantly from the following industries: retail (22.75%) and wholesale trade (15.37), construction (8%), machinery (3.4%), fabricated metal products (3.98%) and non-metal

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2 Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, FYR Macedonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyz Republic, Latvia, Lithuania, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, Tajikistan, Turkey, Ukraine, and Uzbekistan. The data is available at EBRD.

products (4.3%), food (7%) and garments (3.6%). Companies were primarily stock-holding companies. In terms of size, micro companies represented 3.5% of all companies, small companies represented 49.2%, medium 35.4% and large 11.9% of the sample. Country level structures differed from sample averages, since they were representative of the nature of the national economy. Selected country details are provided in continuing. The average firm had 59 full-time employees with 11.8 years of education. Firms had most employees (123) and most educated (13 years) in the Czech Republic.

### 3.2 Estimation procedure

To investigate the relationships between the variables of interest we rely on various statistical methods to extract descriptive statistics and conduct grouping as well as investigation of the relationships between groups, relying on the ordered logit estimation. Since the dependent variables referred to innovation and could either take values 0 or 1 (indicating an answer No or Yes, 1 being Yes and therefore being a superior result to 0). Given the nature of the dependent variable, which is by nature in fact latent in

Table 1: Variables description

Variable	Question number in BEEPS questionnaire	Question and scale
Innovation	(h1+h3+h4+h5)	
Soft innovation	h3+h4+h5	
Product innovation	h1	During the last three years, has this establishment introduced new or significantly improved products or services? (1=Yes, 0=No, recoded from original 2=No)
Process innovation	h3	During the last three years, has this establishment introduced new or significantly improved methods for the production or supply of products or services?? (1=Yes, 0=No, recoded from original 2=No)
Organizational innovation	h4	During the last three years, has this establishment introduced new or significantly improved organizational or management practices or structures? (1=Yes, 0=No, recoded from original 2=No)
Market innovation	h5	During the last three years, has this establishment introduced new or significantly improved marketing methods? (1=Yes, 0=No, recoded from original 2=No)
Access to finance	k30	To what degree is Access to Finance an obstacle to the current operations of this establishment? (k30) (0=no obstacle, 4-very severe obstacle)
Collateral	k13	Referring only to this most recent loan or line of credit, did the financing require collateral? (1=Yes, 0=No, recoded from original 2=No)
Innovation climate	ecah8	During the last three years, did this establishment give employees some time to develop or try out a new approach or new idea about products or services, business process, firm management, or marketing? (Y=1, No=2) (ecah8).
Competition	e2b	In fiscal year for the main market in which this establishment sold its main product, how many competitors did this establishment's main product face? (e2b)
Subsidies	ecaq53	Over the last three years has this establishment received any subsidies from the national, regional or local governments or European Union sources? (Y=1, No=2) (ecaq53)
International certificates	b8	Does this establishment have an internationally-recognized quality certification? (Y=1, No=2) (b8)
TrainingY	(L11a+L11b)/2	Over fiscal year did this establishment have formal training programs for its permanent, full-time employees? To what percentage of all workers (L11a=production workers, L11b=non-production workers)

Source: BEEPS 2012-2014 questionnaire, own calculations.

nature, since we can say that some  $y^*$  depends on a series of unobserved variables, for only some of which we have sufficient information. For example, as Moore (2013) states, one could consider “ $y^*$  as the underlying latent propensity that  $y=1$ ”. As an example, she provides the case of heart attack, which is a binary variable,  $y^*$  is the propensity for a heart attack (Moore, 2013). If  $y^*$  is considered as a probability score than the following is true (Moore, 2013):

$$y^* = \alpha + \beta x + \varepsilon$$

$$y_i = \begin{cases} 1, & y_i^* > \tau \\ 0, & y_i^* < \tau \end{cases}$$

Where  $\tau$  is the threshold. But since  $y^*$  is not observed, the errors are unknown, therefore assumptions must be made about them. Here, either normal or logistic distribution is assumed, conditional on the estimation method. Both methods on average provide very similar results. We rely in the estimation on the logit estimation, and since the dependent variables are ordinal in nature (0=No, which is worse results than 1=Yes), ordered logit is used.

Table 1 summarizes the variables used in the analysis and their formation. To capture the behaviour of innovation, all separate types of innovations were considered (product, process, organizational and marketing). But since the theory claims that in case of financial constraints, companies are more likely to turn to softer innovation, a variable softer innovation was formed as a summary of scores for process, organizational and marketing innovation. Each separate category had a value of 1 if a company introduced a specific innovation type. Thus, soft innovation could have a value between 0 (none of three types were introduced) to 3 (all three types were introduced). Similarly was done for variable innovation, which is a sum of all 4 components and could therefore have values between 0 and 4. Access to finance was measured on a Likert scale, where 0 referred to finance being no obstacle and 4 to finance being a very severe obstacle. Variables regarding innovation climate, collateral, subsidies, competition, international certificates were measured on a Yes or No scale. Training was measured as a per cent of all production and non-production workers, receiving training in firm. Table A1 in the Appendix summarizes means for all variables.

## 4. RESULTS

The purpose of the analysis is to answer the following questions: (1) What is the general innovation activity in transition countries, (2) What is the relationship between financial constraints and innovation (including types of innovation)? (3) What is managerial attitude towards innovation? In section 4.1 the first question is answered, while the (2) and (3) are dealt with in section 4.2.

### 4.1 Innovation, management and resources in transition countries: overview of basic characteristics

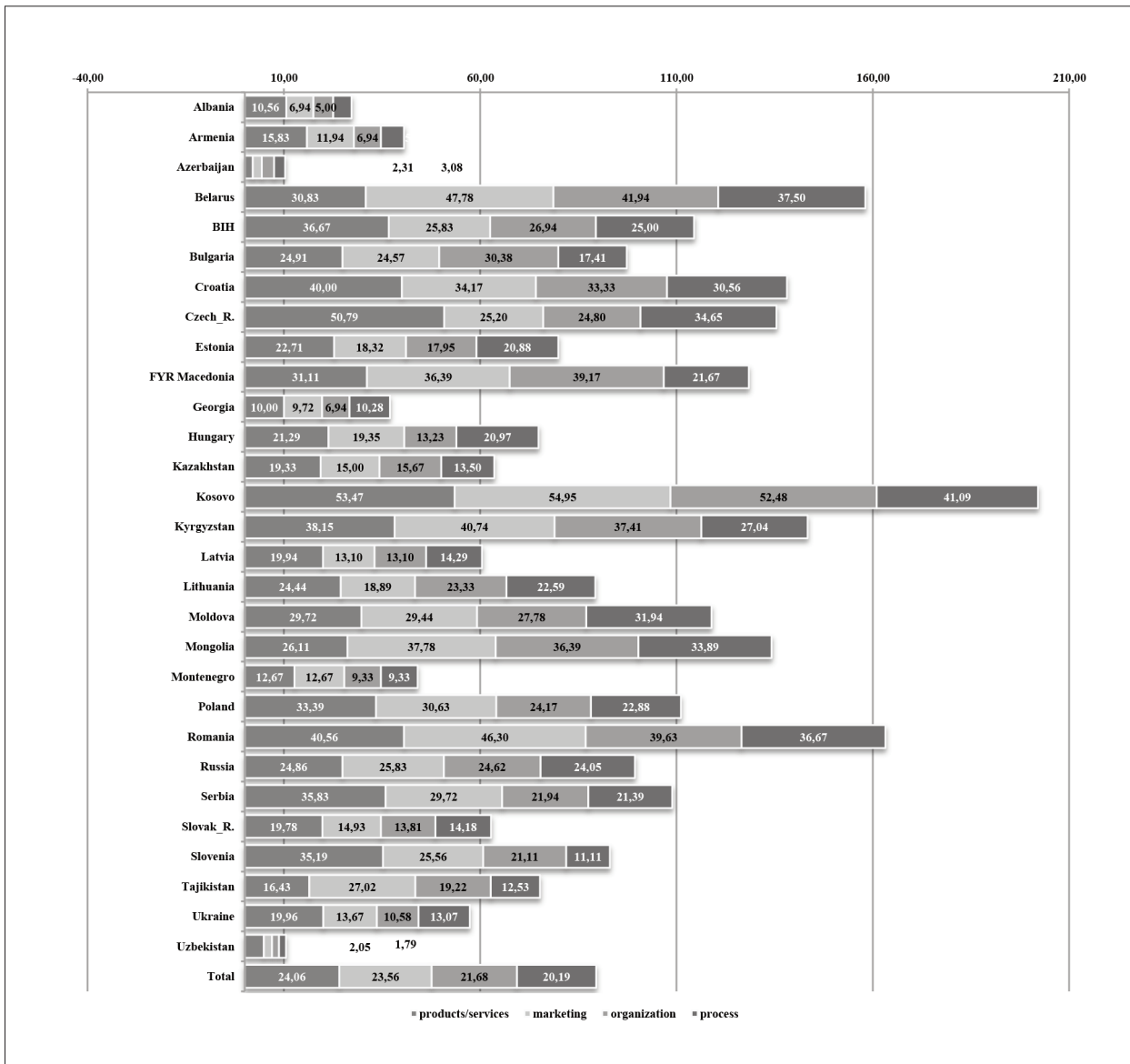
Figure 1 provides a summary view on the innovation activity in transition countries. Generally, CIS (Commonwealth of independent states) economies are less innovative than other transition countries, but based on the data, it is impossible to directly link the level of economic development with innovation activity.

In total, 65% of companies implemented no innovation. Twenty-four per cent of companies implemented product innovation. But the data does indicate that the less developed countries at large are less active in product and process innovation in comparison to other innovation types. Overall, 24% of all companies in the sample introduced new products or services in the past 3 years (Figure 1).

Those that have introduced a product innovation, were relatively successful (Figure 1). Their new product or service in 67% represented also a novelty in their market. Interestingly, the companies that most often reported to send new products that were novelties also in their target markets came from less developed countries (BEEPS database). The seeming comparative success results primarily from the depth of the development of their target market and the intensity of competition there. Generally, companies in all countries were similarly successful in organizational, marketing and process innovation - between 20 to 24% of the entire sample reported to introduce at least one of them. Generally, the processes were more intense in the countries with a deeper development gap.

Generally, companies were operating at 70% capacity utilization, with Slovakia, Czech R., Arme-

Figure 1: Innovation activity in sample economies: During the last three years, has this establishment introduced **new** or **significantly improved** products or services, processes, organizational changes or marketing innovation?



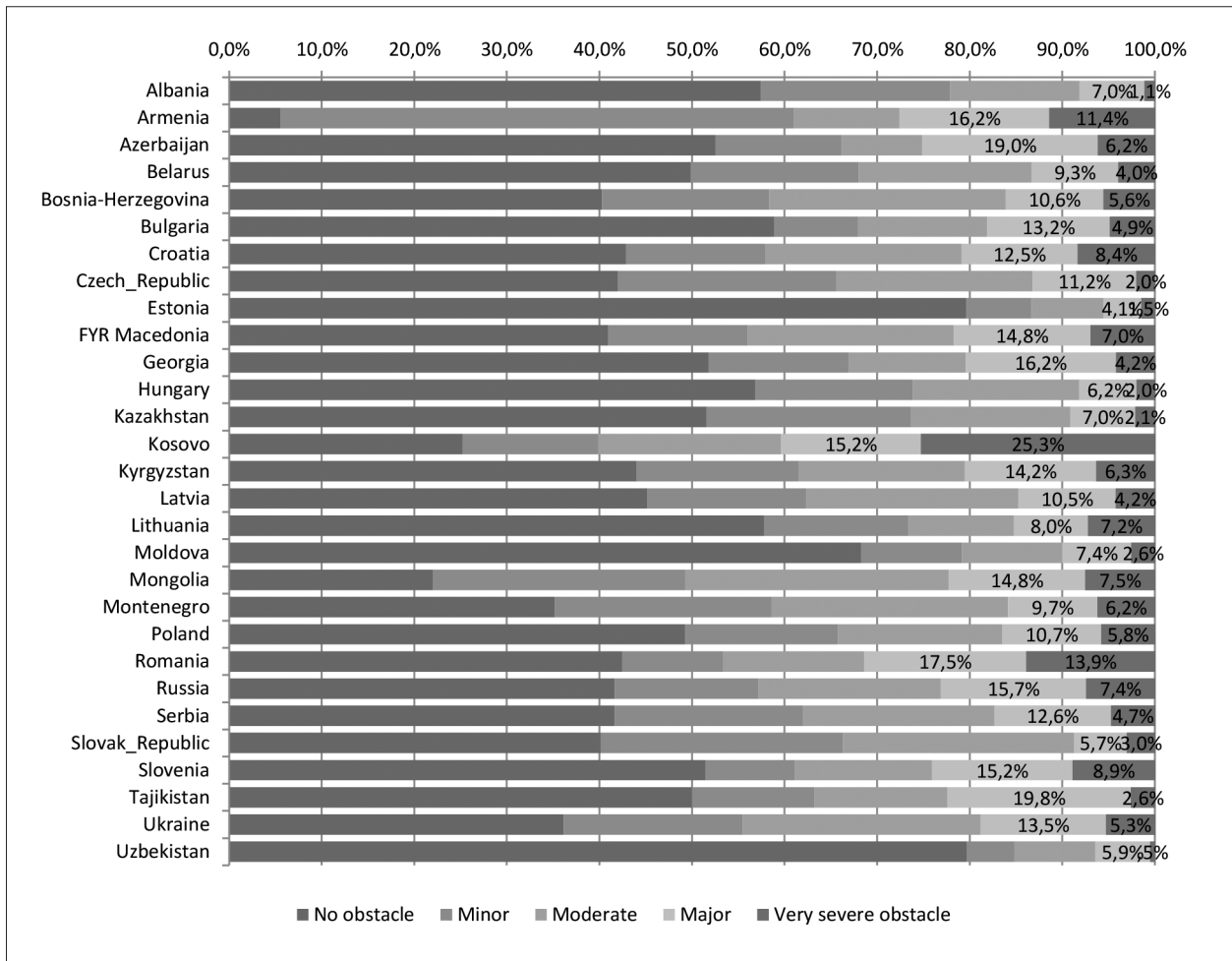
Source: BEEPS 2012-2014 database.

nia, and Moldova reaching over 80%, while Montenegro, Georgia and Tajikistan were below 60% (Figure 2). The companies were between 2012 and 2014 generally facing a decline in sales. Sales was largely dependent on one core firm product. On average, the core product represented 81% of total sales, most in Azerbaijan (97%) and least in Moldova (53.3%). The majority of firms sold almost 90% of products in the domestic markets, for 57% even local market was most important, 3% was indirect

export, while the rest was direct export. Most export oriented economies were Slovenia (with direct export representing 18%), followed by Latvia and Lithuania, where it represented close to 13%. Direct and indirect exports combined were on average highest in the Czech R. (20%), followed by Estonia and Slovenia (19%) and the other two Baltic states with around 17%. Firms on average had 10 competitors, most competitors per firm were recognized in Serbia (17), Romania (16) and Croatia (14).



Figure 2: To what degree is Access to Finance an obstacle to the current operations of this establishment?



Source: BEEPS 2012-2014 database.

We also investigated firms' access to finance (Figure 2) and the attitude of management towards innovation and innovation supporting activities (Figure 3). Finance represents a more severe obstacle primarily in Kosovo, where in total roughly 40% of firms perceived that access to finance is either a major or a very severe obstacle to doing business. Access to finance is very problematic also in Romania, where over 31% of firms perceive finance to be a major or very severe obstacle. In Armenia, Azerbaijan, Slovenia, Russia, Tajikistan, Mongolia, Macedonia, Croatia, Kyrgyzstan and Georgia this percentage is above 20 (but causes differ between countries). Data also shows that in countries, where access to finance was more problematic, more commonly collateral is required.

To examine the managerial attitude towards innovation, we relied on the support of managers to

innovation activities, conducted by their employees, as well as the corporate investment into training programmes. Data reveals that the support to innovation activities of managers, such as trying to stimulate employees to develop a new idea, was on average just over 30%. Much stronger was the investment into training, but primarily for production workers (Figure 3). In continuing we examine, how these variables impacted innovation and which types of innovation.

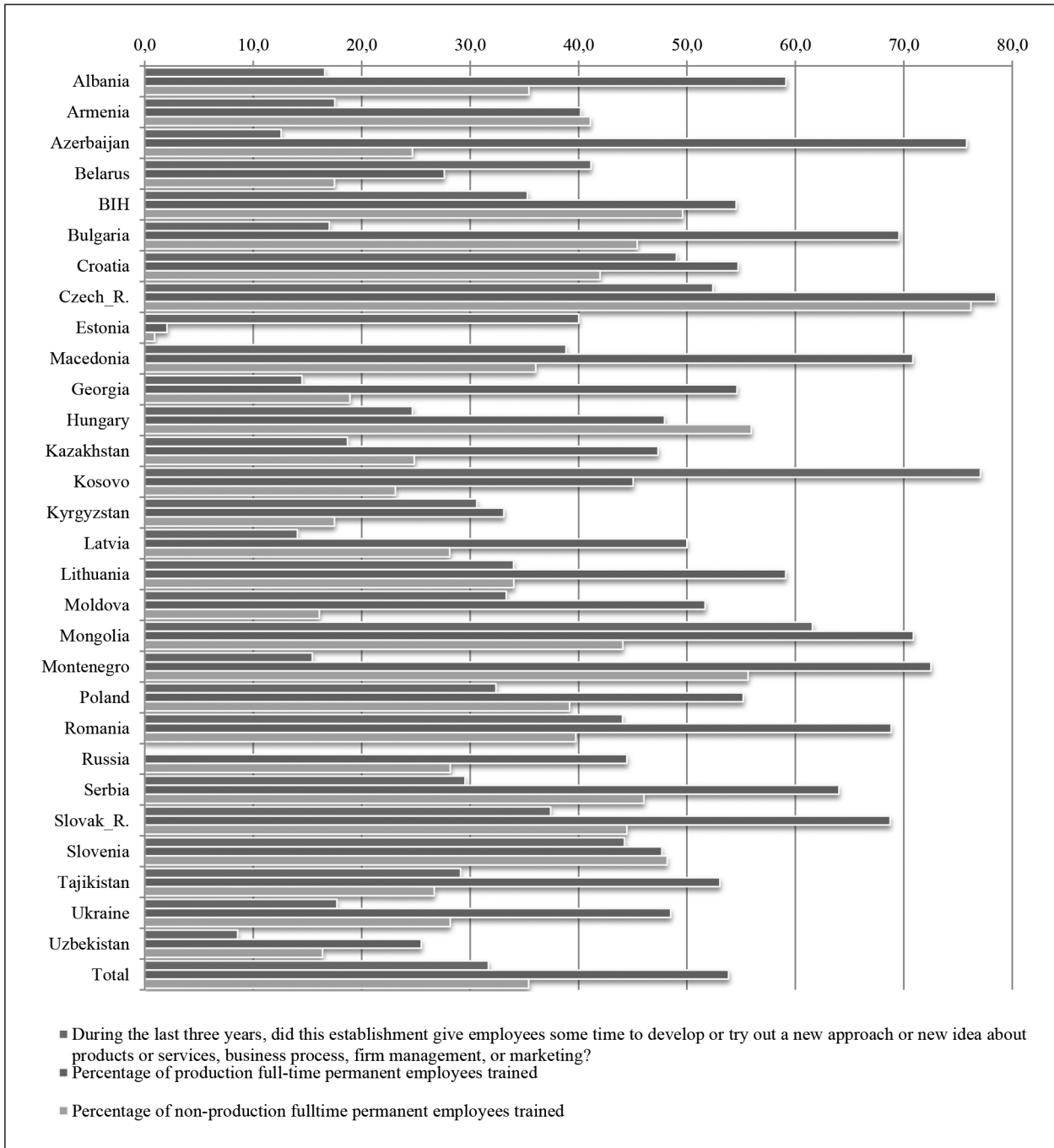
#### 4.2 Innovation, management and resources in transition countries: results

The analysis attempted to answer the following questions: (1) What is the general innovation activity in transition countries, (2) What is the relation-

ship between financial constraints and innovation (including types of innovation)? (3) What is managerial attitude towards innovation? In this segment

we focus on the latter two question. The estimation results, which followed the procedure explained in methodology, are presented in Table 2.

Figure 3: Support to innovation activity by employees and training in the company



Source: BEEPS 2012-2014 database.

Table 2: Ordered logit results

	1	2	3	4	5	6
VARIABLES	Soft Innovation	Innovation	Product	Process	Organization	Marketing
To what degree is <b>Access to Finance</b> an obstacle to the current operations of this establishment? ( <b>k30</b> )	<b>0.0759***</b> (0.0263)	<b>0.0765***</b> (0.0263)	<b>0.0701**</b> (0.0325)	<b>0.0723**</b> (0.0290)	<b>0.0482*</b> (0.0292)	<b>0.0762***</b> (0.0278)
<b>Collateral (k13)</b> . Referring only to this most recent loan or line of credit, did the financing require collateral? (1=Yes, 0=No)	<b>0.297***</b> (0.0730)	<b>0.298***</b> (0.0730)	<b>0.389***</b> (0.0902)	<b>0.400***</b> (0.0802)	<b>0.293***</b> (0.0806)	<b>0.223***</b> (0.0775)
<b>Innovation climate</b> . During the last three years, did this establishment give employees some time to develop or try out a new approach or new idea about products or services, business process, firm management, or marketing? (Y=1, No=2) ( <b>ecah8</b> ).	<b>-1.729***</b> (0.0710)	<b>-1.727***</b> (0.0710)	<b>-1.428***</b> (0.0907)	<b>-1.379***</b> (0.0787)	<b>-1.586***</b> (0.0779)	<b>-1.620***</b> (0.0744)
<b>Competition</b> . In fiscal year for the main market in which this establishment sold its main product, how many competitors did this establishment's main product face? ( <b>e2b</b> )	<b>0.00354*</b> (0.00195)	<b>0.00348*</b> (0.00195)	<b>-0.00413</b> (0.00262)	<b>-0.000492</b> (0.00217)	<b>0.000900</b> (0.00212)	<b>0.00238</b> (0.00201)
<b>Subsidies</b> . Over the last three years has this establishment received any subsidies from the national, regional or local governments or European Union sources? (Y=1, No=2) ( <b>ecaq53</b> )	<b>-0.345***</b> (0.107)	<b>-0.346***</b> (0.107)	<b>-0.299***</b> (0.105)	<b>-0.407***</b> (0.109)	<b>-0.342***</b> (0.110)	<b>-0.276***</b> (0.106)
<b>International certificates</b> . Does this establishment have an internationally-recognized quality certification? (Y=1, No=2) ( <b>b8</b> )	<b>-0.381***</b> (0.0787)	<b>-0.379***</b> (0.0787)	<b>-0.348***</b> (0.0893)	<b>-0.304***</b> (0.0813)	<b>-0.396***</b> (0.0849)	<b>-0.222***</b> (0.0786)
<b>Training</b> . Over fiscal year did this establishment have formal training programs for its permanent, full-time employees? (Y=1, No=2) ( <b>L11</b> )	<b>0.559***</b> (0.0698)	<b>0.561***</b> (0.0698)	<b>0.501***</b> (0.0895)	<b>0.455***</b> (0.0786)	<b>0.666***</b> (0.0772)	<b>0.612***</b> (0.0743)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant cut4		1.275 (1.500)				
Constant cut2	-0.00640 (1.484)	-0.504 (1.500)				
Constant cut3	1.171 (1.484)	0.453 (1.500)				
Constant cut1	-1.052 (1.484)	-1.300 (1.500)	-0.228 (1.639)	-0.0204 (1.621)	0.229 (1.635)	-0.148 (1.644)
Observations	5,967	5,965	6,002	5,989	5,990	5,994
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Source: BEEPS Database. Own calculations.

The results show that financial constraints are related to innovation. In fact, more stringent financial situation is stimulative to innovation. If first the variable of access to finance is considered, the impact is stronger on softer innovation types, primarily on marketing and process innovation. Interestingly, albeit positive, the impact is in fact weakest on organizational innovation. But these results could be explained by the fact that in stringent financial conditions, companies rely more on internal sources (also to obtain additional funding internal sources are important, see Lah et al., 2016) and are therefore primarily concerned with immediate impact on either revenue (marketing innovation) or cost (process innovation). Interestingly, collateral requirements have biggest impact on product innovation, but in general also are positively related to innovation. Although collateral is an indirect measure of obstacles to finance, the logic is similar to the first arguments.

Highly important and stimulative to all types of innovation is corporate attitude towards innovation. If companies did not stimulate workers to try to develop something new (value of variable No=2) or did not include as many workers into training, the innovation would be lower. Therefore, this result supports the notion that corporate attitude towards innovation is extremely important and the lack of the awareness of the link is especially problematic in transition countries (as found also by Prašnikar et al., 2016).

Moreover, also business environment variables, such as degree of competition, externally available sources of funding (subsidies) and the fact that company is trying to “go international” also by (initially) complying with international standards have a significant and expected impact. The weakest impact is of the number of competitors, which is only evident for the total innovation or soft innovation combined, while the impact on each innovation category separately is not significant.

## 5. CONCLUSION

The paper investigated the relationship between innovation, financial constraints and corporate attitude towards innovation, which is part of strategic corporate behaviour and is linked closely to many segments of corporate governance.

The theory claims that in case of financial constraints, companies turn primarily to softer innovation, such as process, marketing and organizational, since these are linked to less financial requirements. The rich BEEPS cross-sectional data shows that this is only partially true. Financial constraints impact most and impact positively primarily innovation types which immediately impact firm performance (cost or revenue). Even more important is the impact of corporate behaviour and support to knowledge creation. Last, also environmental variables are very important.

Overall, the paper extends the innovation discussion in transition countries by relying on the BEEPS data. It is to the best of our knowledge the first paper to discuss the impact of financial constraints on innovation in these economies. As such, it broadens also the knowledge about the limits to intangible capital formation in these countries (e.g. VanArk et al., 2009, for a discussion of the European developed economies). Moreover, the paper confirms on a much broader scale the conclusions of Prašnikar et al. (2016) that internal corporate variables are extremely important for innovation, primarily knowledge and firm competences as well as corporate attitude. All these components form the genetic material of the firm (Nelson and Winter, 1982).

These results are extending the current state of the art in the field of innovation, innovation resources and managerial attitude towards innovation in transition economies. But the empirical assessment of the impact of resource constraints and managerial attitudes on innovation was faced with several limitations. The first and most important was the nature of data. The analysis relies on the EBRD BEEPS database, which is primarily intended for studying the impact of business environment on firm performance. The selection of variables related to innovation and measurement scales were not best. Different data would allow also a more in-depth econometric approach. But primarily the availability of resources and variables dealing with corporate attitude towards innovation were more challenging. First, it would be ideal to have more data about the human resources directly linked to different innovation types (e.g. educational structure of departments in firms) as well as financial re-

sources, pertaining to innovation. But due to data availability we had to rely on variables capturing a certain phenomenon in the firm at large. Second, due to the nature of the survey, primarily Yes/No or Likert scale questions were used. For econometric testing, exact data would be much better. Next, the analysis relied only on data from BEEPS V (round 5, 2012), not a panel data-set. In the future, the work should continue to study the details of corporate behaviour and innovation in these economies by extending the study to the study of the panel, but due to the changing nature of the survey, the “common denominator” or the set of available variables will narrow down further.

In the future, the research of the nature of innovation in transition economies and the role of resources and attitudes for innovation should continue, in order to extend the study to a panel data. Another aspect, relevant from the catch-up process perspective is also the comparative analysis of the role of resources and attitudes in developed and developing (transition) economies. Namely, since growth is increasingly driven by intangibles (Corrado et al., 2009), especially in developed economies, the catch-up should focus on imitating not just products, but primarily also firm behaviour in order to be able to understand and use their successful practices.

## EXTENDED SUMMARY / IZVLEČEK

**Ozadje.** Gospodarska rast v tranzicijskih državah je bila po začetnem globokem padcu bruto domačega proizvoda zelo uspešna. Proces dohitevanja razvitih držav, predvsem EU15, so pogosto zaznamoval stopnje rasti, ki so dosegale ali celo presegle 10 % (Eurostat, 2016). Vendar pa je rast produktivnosti zaostajala za gospodarsko rastjo, kar pomeni, da se z vidika BDP na prebivalca ni dosegalo optimalnih rezultatov.

Za rast produktivnosti je ključno povečevanje dodane vrednosti na enoto vložene delo. To pa najpogosteje povezujemo s produktivnimi, procesnimi, organizacijskimi ali pa tržnimi inovacijami (OECD, 2005). Inovacije evropske razvojne strategije (npr. H2020, nacionalne strategije pamtne specializacije) izpostavljajo kot izjemno pomemben dejavnik dolgoročne rasti. Vendar pa strategije pogosto zanemarjajo probleme, s katerimi se soočajo na področju inovacij podjetja. Podjetja so namreč tista, ki so nosilci inovacij.

Zavedanje o pomenu inovacij se sicer v državah v tranziciji krepi, vse več podjetij razvija nove proizvode, izboljšuje procese, uvaja nove organizacijske prakse in uvaja številne nove tržne prijeme ali pa prodira na nove trge (EBRD, 2014). Podjetja iz držav v tranziciji pogosto uspešno prenašajo znanje in tehnologijo (v skladu z modelom odprtih inovacij, Chesbrough, 2003, Redek and Farčnik, 2015), do katerih imajo dostop preko mednarodnih trgov; zaradi izvozno-usmerjenega modela rasti so namreč močno vpeta v globalne tokove blaga in kapitala. Res pa je, da le majhen odstotek the podjetij predstavi inovacije, ki so hkrati novost tudi na globalnih trgih.

Raziskave opozarjajo, da je z vidika inoviranja izjemno pomembno dvoje. Najprej je pomembno, da ima podjetje ustrezne resurse (Nohria in Gulati, 1996), tako človeške (človeški kapital) kot tudi finančne. Forbes in Wield (2000) opozarjata med drugim, da pomanjkanje resursov spremeni tudi naravo inovacijskih procesov; podjetja se osredotočajo na inkrementalne inovacije ter dizajn in razvoj namesto, da bi skušala aktivno raziskovati v smeri ustvarjanja globalnih novosti. Zato je mogoče v državah, ki dohitevajo razvite, v povprečju bolj pogosto zaslediti procesne, organizacijske in tržne kot pa produktne inovacije. Te so manj zahtevne z vidika potrebnih virov, ravno tako pa vplivajo na dvig produktivnosti. Raziskave pa opozarjajo tudi, da razpoložljivost virov ni zadosten pogoj za inovacije. Odnos podjetja, tako lastnikov kot tudi managerjev, do inoviranja (OECD, 2009, Redek et al., 2010, Prašnikar et al., 2016). V kolikor na ravni podjetja tako s strateške plati kot tudi sicer ne obstaja zaveza k inoviranju, bo takšno podjetje zagotovo manj intenzivno vlagalo v inovacije in dolgoročno bo tudi manj uspešno pri inoviranju.



**Namen** članka je analizirati vpliv razpoložljivosti virov in pa odnosa podjetja do inovacij na inovacijsko dejavnost v podjetjih v tranzicijskih državah. Analiza temelji na podatkovni bazi Business environment and enterprise survey 2012-2014, ki zajema podatke o obnašanju podjetij in pa poslovnem okolju v državah v tranziciji.

**Rezultati** kažejo, da v preučevanem obdobju kar 65% podjetij ni inoviralo, 24% podjetij je uvedlo produktne inovacije, med 20 in 24% podjetij je uvedlo tudi vsaj enega od ostalih tipov novosti (procesne, organizacijske, tržne). Večina podjetij je prodala skoraj 90% proizvodov na domačem trgu. Manjše države so v povprečju bolj odprte in imajo zato tudi več dostopa do tujih trgov in tuje tehnologije. Predvsem manj razvite države iz skupine tranzicijskih so poročale, da je dostop do zunanjih virov pomembna ovira pri poslovanju, podjetja pa v povprečju niso veliko vlagala v razvoj kadrov in krepitev človeškega kapitala.

Regresijska analiza je pokazala, da finančne omejitve vplivajo na inovacijsko dejavnost. Finančne omejitve tako bolj vplivajo na procesne in tržne inovacije in pa pozitivno na organizacijske. Rezultat je smiseln, saj se podjetja v primeru pomanjkanja zunanjih finančnih virov pogosto osredotočijo na tiste vidike, ki bolj neposredno vplivajo na prihodke (tržne) ali stroške (procesi). Rezultati kažejo tudi, da je na inovacije pomembno vplival tudi odnos podjetij do spodbujanja delavcev k inoviranju, prisotnost zunanjih vplivov (konkurenca na trgu, dostop do znanja s tujih trgov), pa tudi pomoč države.

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## APPENDIX

Table A1: Descriptive statistics: means

	Innovation	Soft innovation	Product innovation	Process innovation	Organizat. innovation	Market innovation	Access to finance - obstacle	Collateral	Innovation climate	Competition	Subsidies	Intern. certificates	Training
Albania	0.20	0.17	0.04	0.05	0.05	0.07	0.74	0.23	1.83	6.95	1.98	1.75	0.26
Armenia	0.29	0.25	0.04	0.06	0.07	0.12	1.72	0.41	1.83	6.02	1.97	1.76	0.19
Azerbaijan	0.09	0.08	0.01	0.03	0.03	0.02	1.13	0.14	1.87	3.94	1.97	1.87	0.18
Belarus	1.48	1.27	0.21	0.37	0.42	0.48	0.99	0.27	1.59	12.29	1.96	1.85	0.48
BIH	0.97	0.78	0.19	0.25	0.27	0.26	1.23	0.46	1.65	8.54	1.86	1.70	0.49
Bulgaria	0.82	0.72	0.10	0.17	0.30	0.25	0.96	0.39	1.83	10.39	1.92	1.74	0.42
Croatia	1.22	0.98	0.24	0.31	0.33	0.34	1.28	0.47	1.51	13.95	1.79	1.72	0.51
Czech_R.	1.14	0.84	0.30	0.35	0.25	0.25	1.08	0.40	1.48	10.89	1.71	1.59	0.55
Estonia	0.69	0.57	0.13	0.20	0.18	0.18	0.41	0.33	1.60	7.83	1.82	1.80	0.38
Macedonia	1.12	0.97	0.15	0.22	0.39	0.36	1.32	0.43	1.58	12.18	1.93	1.68	0.44
Georgia	0.32	0.25	0.07	0.10	0.07	0.09	1.06	0.39	1.86	5.92	1.98	1.88	0.12
Hungary	0.67	0.53	0.15	0.20	0.13	0.19	0.79	0.29	1.72	11.84	1.76	1.45	0.15
Kazakhstan	0.52	0.44	0.09	0.14	0.16	0.15	0.86	0.17	1.81	8.99	1.95	1.82	0.33
Kosovo	1.81	1.49	0.32	0.41	0.52	0.55	1.91	0.59	1.08	10.45	1.79	1.62	0.52
Kyrgyzstan	1.24	1.04	0.20	0.27	0.37	0.41	1.21	0.25	1.69	16.45	1.97	1.75	0.54
Latvia	0.43	0.36	0.07	0.12	0.12	0.12	1.11	0.16	1.86	8.03	1.91	1.79	0.30
Lithuania	0.72	0.58	0.13	0.21	0.21	0.17	0.91	0.25	1.66	12.76	1.78	1.79	0.38
Moldova	1.12	0.88	0.24	0.31	0.28	0.28	0.65	0.32	1.67	6.48	1.90	1.82	0.37
Mongolia	1.27	1.08	0.19	0.34	0.36	0.38	1.58	0.50	1.38	10.90	1.93	1.86	0.56
Montenegro	0.36	0.31	0.05	0.09	0.09	0.13	1.09	0.41	1.85	14.29	1.95	1.80	0.20
Poland	0.93	0.76	0.18	0.22	0.24	0.30	1.07	0.17	1.66	11.74	1.83	1.68	0.34
Romania	1.46	1.22	0.24	0.37	0.39	0.46	1.49	0.41	1.56	15.10	1.90	1.65	0.44
Russia	0.88	0.73	0.15	0.24	0.24	0.25	1.32	0.20	9.78		1.96	1.88	0.43
Serbia	0.89	0.73	0.16	0.21	0.22	0.30	1.18	0.31	1.70	16.88	1.83	1.63	0.35
Slovak R.	0.49	0.41	0.08	0.14	0.13	0.14	1.05	0.29	1.63	8.90	1.86	1.54	0.44
Slovenia	0.66	0.58	0.08	0.11	0.21	0.26	1.20	0.47	1.56	11.19	1.72	1.72	0.48
Tajikistan	0.68	0.59	0.09	0.13	0.19	0.27	1.12	0.13	1.71	7.41	1.95	1.81	0.31
Ukraine	0.44	0.35	0.09	0.13	0.10	0.13	1.33	0.14	1.82	9.54	1.96	1.81	0.20
Uzbekistan	0.06	0.05	0.01	0.02	0.02	0.02	0.42	0.25	1.91	5.65	1.98	1.88	0.26

Source: BEEPS Database. Own calculations.