

Enterprise Systems in Transition Economies: An Initial Literature Review

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Abstract

In spite of the fact that enterprise systems have become essential in modern organizations, there is a scarcity of research on this topic in the context of transition economies, defined as countries that are in the process of moving or have recently moved from a centrally planned economic system to a market-driven system. In this initial study, we conduct a review of 27 journal papers on enterprise systems in transition economies published in the years 2004-2014. We examine the research focus, research approach, and theoretical foundation. Based on the analysis of themes and current trends in the existing literature we identify gaps and propose opportunities for future research.

Keywords

Enterprise system, enterprise resource planning, transition economy, literature review, research trends.

Introduction

The term transition economy refers to a country (or economic market place) that is in the process of moving or has recently moved from a centrally planned economic system to a market-driven system (Roztocki and Weistroffer 2008; Roztocki and Weistroffer 2014). This includes the countries that resulted from the dissolution of the Soviet Union as well as the other countries of the former Eastern (or Soviet) Bloc. Also, the successor countries of the former Yugoslavia are included in this categorization, as Yugoslavia, though politically neutral during the cold war, had retained a communist political and centrally planned economic system. Furthermore, Albania, which had aligned itself with communist China after the Chinese-Soviet split in 1960, is considered a transition economy. Also included under the term transition economies are the People's Republic of China and the Socialist Republic of Vietnam, which still retain communist political systems, but are gradually liberalizing regulations and allowing for increased private sector business activities (Roztocki and Weistroffer 2011a).

Though sometimes the terms transition economy, emerging economy, and developing country are used interchangeably, there are particular characteristics that distinguish transition economies from other emerging or developing countries, as the long history of central planning has had an extensive impact on the business and organizational culture in transition economies (Piotrowicz 2009). This business and organizational culture has also strongly influenced the acceptance and management of information and communication technology (ICT) in transition economies (see, for example, Bernroider et al. (2011) Roztocki and Weistroffer (2011a), Soja (2011)). The models and theories developed in and for Western countries may be of limited use in transition economies (Hoskisson et al. 2000) and the economic gap still exists (Kowal and Roztocki 2013). Thus, it is important to look at research on Enterprise Systems (ES) specifically in transition economies separately from research on ES in highly developed countries.

ES are large and complex application software packages designed to support all functional areas of an enterprise. ES provide for seamless integration of all organizational data flows, such as financial and

accounting data, human resource data, manufacturing data, customer services data, etc. ES may bring great benefits to an organization in reducing transaction costs, increasing productivity, and providing improved customer satisfaction (e.g. Chou and Chang 2008). However, implementing ES also comes with great risks, as it puts enormous strains on business resources and often requires substantial reengineering of business processes (Subramoniam et al. 2009).

Literature reviews help advance knowledge in a specific field of interest by highlighting gaps and raising questions that call for further investigation (Webster and Watson 2002). Thus, the motivation for our study is to help identify and assess previously published work on ES in transition economies, and to point out important and promising future research opportunities. The research questions we ask are:

1. What are the observable themes and trends in published studies on ES in transition economies?
2. What needs and opportunities exist for further research?

The remainder of our paper is structured as follows. After a brief discussion about the background of the study, we introduce our research methodology and the analytical framework. Presentation of the results is followed by a discussion. The paper concludes with summarizing the major contributions.

Background

There have been several published literature reviews on ES, but none that specifically focused on ES in transition economies. Perhaps the oldest literature review on ES was by Esteves and Pastor (2001), who reviewed 189 conference and journal papers from the years 1997 through 2000. They observed that in that time period most researchers were focusing on enterprise resource planning (ERP) systems implementation and mostly on ERP delivered by SAP. In a later study, Shehab et al. (2004) reviewed 76 publications (5 books, 8 conference proceedings, and 63 journal papers) from 1990 through 2003 and, based on their observations, they recommended that newer techniques, such as product costing, should be included in ERP packages. Moller et al. (2005) in a working paper identified the most productive ERP researchers at the time and performed a key word analysis. The results from their key word analysis confirmed the observation of Esteves and Pastor (2001) that much research focuses on ERP implementation.

Botta-Genoulaz et al. (2005) identified 250 articles from 1996 through 2004, of which they analyzed 80 articles in-depth. They found that before the year 2000 most researchers behaved more like observers reporting on case studies and focusing on success or failure of an ERP system. But from 2000 on, researchers took on more active behaviors, providing advice and specific suggestions to the profession. They classified the ERP literature into six main categories: implementation of ERP, optimization of ERP, management through ERP, ERP software, ERP for supply chain management, and case studies. Moon (2007) reviewed 313 papers from 79 journals covering the period January 2000 to May 2006 and categorized the reviewed research into six themes: ERP implementation, ERP use, extensions of ERP, value creation of ERP, trends in ERP systems, and education on ERP. The study further recommends a large scale, simultaneous survey across various countries to gain more insights.

Esteves and Bohorques (2007) identified 449 publications from 2001 through 2005 and again confirmed the results from Esteves and Pastor (2001) that much ERP research focuses on the implementation of ERP systems and on SAP systems specifically. Nazemi et al. (2012) reviewed 326 journal and conference papers from 1997 through 2011 and also confirmed the findings of Esteves and Pastor (2001). More recently, based on a review 219 papers published from 2006 through 2012, Eden et al. (2014) confirm that the focus on implementation dominates ERP/ES research.

In addition to these literature reviews that examined general ES or ERP research, there have been some literature reviews that focused on more specific aspects. For example, Grabski et al. (2011) investigated accounting related themes in ERP research and concluded that ERP research needs to be better grounded theoretically and that new theories need to be developed. In a similar vein, Aloini et al. (2007) reviewed 75 papers investigating risk factors in the ERP life cycle.

While these reviews contribute to a better understanding of current trends and themes in ES research in general, they do not address the specific circumstances and characteristics of transition economies and of information technology (IT), and specifically ES, in transition economies.

Under communism, there was an absence of a profit-driven business culture (Roztocki and Weistroffer 2011a). Now, during the transition, a new entrepreneurial-minded management generation is emerging, but a cultural divide still exists between young, independent-minded managers, and some of the older generation, used to being micromanaged and reluctant to take initiatives. Also, during the cold war, communist countries were widely isolated from western technology transfer, and IT was used more for operational purposes, rather than for innovation. Early on in the transition, there was great enthusiasm for adoption of new technologies, but these frequently failed to meet the often unrealistic expectations. Later in the transition, companies became more cautious investing in IT, though they still tried to copy western solutions and business models. Now, more than 20 years into the transition, they largely recognize the need for new approaches in the use of IT to support new business models, which may be different from those established in the highly developed countries (Roztocki and Weistroffer 2011b).

Research on IT specific to transition economies, though still limited, is now greatly increasing. While much of the research dealing with IT in transition economies and published in high impact international journals is authored or co-authored by researchers based in developed countries, more and more academics in transition economies now are faced with pressure to publish in top quality international journals.

Methodology

To identify relevant articles for our review, we searched library databases using keywords such as enterprise system, ERP, and transition economy, as well as specific country names (e.g. Czech Republic, Poland, Slovakia, etc.). We also checked the reference sections of already identified papers for additional sources. To be included in our review, the article had to be published in a journal and clearly indicate the place of data collection or focus of investigation. We only included articles that reported on ES in double or triple transition economies (see Roztocki and Weistroffer (2014)), that is, countries that have undergone political as well as economic transition, thus excluding China and Vietnam, which, though also considered transition economies, still have communist political systems. Using these criteria, we ended up with a sample of 27 papers spanning the years 2004 through 2014 (see Table 1).

Year	Count
2004	1
2006	1
2007	1
2008	2
2009	2
2010	3
2011	4
2012	4
2013	6
2014	3
Total	27

Table 1. Papers by Year

As can be seen from Table 1, the first paper we identified dealing with ES in a transition economy is from 2004. Comparing this to the review of Botta-Genoulaz et al. (2004) who went back as far as 1996, we see that there was a substantial lag for research on ES specifically in transition economies to become prevalent. Table 2 shows the included articles by journal. As can be seen in Table 2, only four journals published more than one paper from our sample.

Journal	Count
Amfiteatru Economic	1
Annals of the University of Petrosani, Economics	1
Applied Mechanics and Materials	1
Economic Research - Ekonomska Istrazivanja	1
Electronic Journal of Information Systems in Developing Countries	1
Enterprise Information Systems	3
Financial Internet Quarterly „e-Finanse” 8	1
Industrial Management & Data Systems	2
Informatica Economica	2
Information Systems Management	5
Information Technology for Development	1
Interdisciplinary Journal of Information, Knowledge, and Management	1
International Journal of Enterprise Information Systems	1
Journal of Enterprise Information Management	1
Journal of Information Systems Education	1
Journal of Systems Integration	1
Production Planning & Control	1
Revista Informatica Economica	1
Systemova Integrace	1
Total	27

Table 2. Papers by Journal

In conducting our review, we followed the framework shown in Figure 1, adapted from Roztocki and Weistroffer (2014). Thus, we categorized the papers by research focus, research approach, and theoretical foundations. Research focus includes the specific topic of the investigation, the country in which the investigation was conducted, the specific ES issue that it refers to, and the lifecycle phase it addresses. For research approach, we looked at the source of the data used and the unit of analysis, e.g. country, organization, or individual. Theoretical foundation includes specific theories or frameworks that were applied in a study.

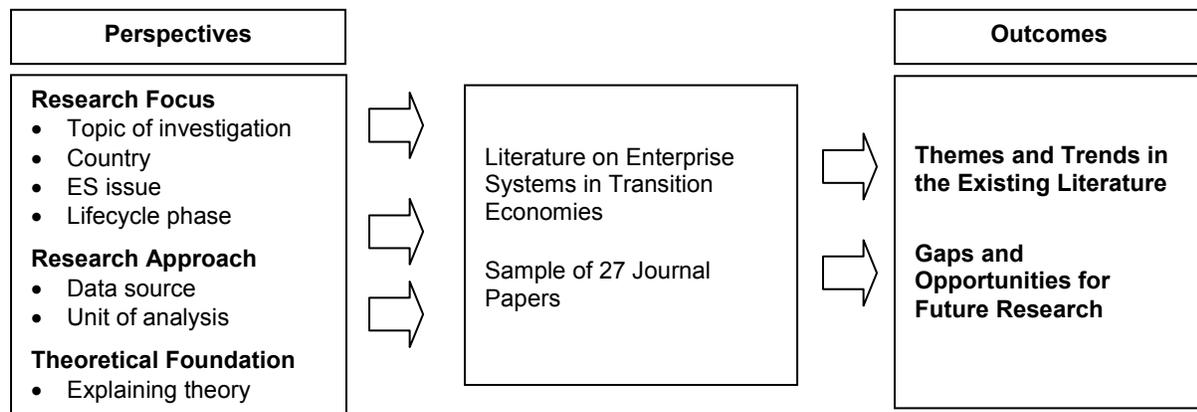


Figure 1. Analytical Framework – Perspectives and Outcomes (adapted from Roztocki and Weistroffer (2014))

Results

Research Focus

In the first step of our investigation, for each of the 27 papers, we identified the specific topic area of the paper and the country in which the particular study was conducted. Next, we categorized each paper

according to the ES issue addressed by the paper using an adaption (Table 3) of the taxonomy developed by Roztocki and Weistroffer (2009).

ES Issue	Description
Diffusion	Acceptance and spread of ES in organizations
Strategy	Organizational strategy with respect to ES implementation and use
Design	Conception and design of ES to meet the identified needs
Implementation	Development and adoption of ES
Management	Administration and supervision of ES
Impact	Influence of ES on business, economy, and society
Economics	Costs and benefits of ES implementation and use
Education	Education and training of analysts and users

Table 3. ES Issues

To categorize the papers by lifecycle phase, we use the expanded 7-stage framework from Cooper and Zmud (1990) and Themistocleous et al. (2011), as depicted in Table 4.

Phase	Description
Initiation	Organizations feel the need for a new ES because of deficiencies in the existing system(s). Existing ES may reach the Decline phase and may need to be replaced.
Adoption	Organization begins concrete steps in acquiring a new ES.
Adaptation	ES implementation takes place. ES is acquired/developed, installed and configured. Users' training takes place.
Acceptance	ES is employed in the organization on a daily basis.
Routinization	ES is maintained and its usage is aligned with the organizational business rules.
Infusion	ES drives organizational efficiency.
Decline	ES shows obsolescence and deficiencies.

Table 4. Enterprise System Lifecycle (Adapted from Cooper and Zmud (1990) and Themistocleous et al. (2011))

Table 5 lists all 27 papers in our sample with corresponding topic of investigation, country of study, ES issue, and the most examined lifecycle phase.

Paper	Topic of Investigation	Country	ES Issue	Lifecycle Phase
Antipov et al. 2014	Possibility of using ERP in Russian construction industry	Russia	Strategy, impact	Initiation
Avram 2010	Product selection and risk management	Romania	Strategy	Initiation
Bernroider et al. 2011	Level and performance of ERP adoption; comparison between transition and developed economies	Austria, Slovakia, Slovenia	Implementation, impact	Whole lifecycle
Dorobat & Nastase 2010	Training methods during ES implementation, personalization of training	Romania	Education	Adaptation and acceptance
Dumitru et al. 2013	Evolution of ES and improvement in organizational performance; company fit	Romania	Design, impact, economics	Whole lifecycle, but emphasis on adoption and adaptation
Edelhauser 2011	Influence of BI and ERP systems on company performance and managerial decisions	Romania	Impact, economics	Adaptation, acceptance, routinization, infusion
Jarmoszko & Gendron 2004	Decision on ES adoption: build your own system or off-the-shelf; system selection (regional vs. global brand)	Belarus	Strategy	Initiation and adoption
Kataev et al. 2013	Evolution of ES market in Russia 1992-2012	Russia	Diffusion	Initiation and adaptation
Lech 2012	Information gathering methods used during ES selection	Poland	Strategy	Adoption

Paper	Topic of Investigation	Country	ES Issue	Lifecycle Phase
Lech 2013	Understanding of success evaluation in ES implementation projects	Poland	Impact, economics	Adaptation, acceptance, routinization, infusion
Malinic & Todorovic 2012	Impact of ERP implementation on management accounting	Serbia	Impact, economics	Acceptance, routinization, infusion
Mittner & Buchalcevova 2014	Requirements specification for an ERP system for SMEs operating in software development industry	Czech Rep.	Design	Initiation and adoption
Rizescu 2008	Analysis of Romanian ERP systems (i.e. developed by Romanian companies), market analysis, system comparison	Romania	Diffusion, impact	Initiation, adoption, adaptation
Sodomka et al. 2012	Case study of ERP implementation in a manufacturing company	Czech Rep.	Implementation	Whole lifecycle
Soja 2006	CSFs in ERP implementation; influence of factors on ERP implementation success	Poland	Implementation, diffusion, economics	Whole lifecycle
Soja 2008	Difficulties experienced by organizations in emerging economies during the process of ES implementation	Poland	Implementation, strategy, diffusion	Whole lifecycle
Soja 2009	ES implementation issues and success factors	Poland	Implementation, strategy, diffusion	Adoption, adaptation, acceptance, routinization
Soja 2010	Determinants of ES adoption success in full-scope manufacturing companies	Poland	Strategy, diffusion, economics	Whole lifecycle
Soja 2011	ES adoption CSFs and barriers	Poland	Strategy, diffusion	Whole lifecycle
Soja & Paliwoda-Pękosz 2009	Relationships among difficulties in ES adoption and source problems	Poland	Strategy, implementation	Whole lifecycle
Soja & Paliwoda-Pękosz 2013a	Benefits from ES adoption in transition economies	Poland	Impact	Whole lifecycle
Soja & Paliwoda-Pękosz 2013b	Impediments to ES implementation across the system lifecycle, similarities and differences in transition and developed economies	Poland	Strategy, implementation	Whole lifecycle
Soja & Put 2007	Identifying the characteristics of ERP implementations related to project success	Poland	Impact, diffusion, economics	Whole lifecycle
Soja & Weistroffer 2014	Motivations for ES adoption, influence of motivations on ES success, and differences between transition and developed economies	Poland	Strategy, diffusion	Whole lifecycle
Themistocleous et al. 2011	ES adoption lifecycles in transition vs. developed economies; phases, activities, and key players	Poland, UK	Implementation	Whole lifecycle
Zarzycka 2012	Impact of ERP implementation on management accounting	Poland	Impact, economics	Routinization and infusion
Ziemia & Oblak 2013	CSFs for ERP implementation in public administration	Poland	Strategy	Whole lifecycle

Table 5. List of Papers with Topics of Investigation, Countries of Study, ES Issues, and Lifecycle Phases

As can be seen from Table 5, and as summarized in Table 6, the published research appears to be conducted in only a small set of countries, mostly now members of the European Union (EU). Only four papers report on research conducted outside of the EU, two in Russia, and one each in Belarus and Serbia. More than half of the papers report on research in Poland. As observed also by Roztocki and Weistroffer (2014), there are relatively few authors that account for most of the published articles, and these authors generally conduct their research in their home country, which may explain the relatively large number of papers from only a few specific countries.

Country	Count
Belarus	1
Czech Republic	2
Poland	15
Romania	5
Russia	2
Serbia	1
Slovak Republic, Slovenia	1
Total	27

Table 6. Transition Economies Investigated

Research Approach

For research approach we examined the papers in our sample as to the source of the data used and the unit of investigation, as shown in Table 7.

Paper	Data Source	Unit of Analysis
Antipov et al. 2014	Not specified	Organization
Avram 2010	Not specified	Organization
Bernroider et al. 2011	Survey	Country
Dorobat & Nastase 2010	Not specified	Organization
Dumitru et al. 2013	Case study	Organization
Edelhauser 2011	Case study (multiple companies)	Organization
Jarmoszko & Gendron 2004	Case study (teaching case study)	Organization
Kataev et al. 2013	Reports	Country
Lech 2012	Survey	Organization
Lech 2013	Survey/Case study (multiple projects)	Project
Malinic & Todorovic 2012	Survey	Organization
Mittner & Buchalceva 2014	Survey/Interviews	Organization
Rizescu 2008	Reports	Organization
Sodomka et al. 2012	Case study	Organization
Soja 2006	Survey	Project
Soja 2008	Survey	Project
Soja 2009	Survey	Project
Soja 2010	Survey	Project
Soja 2011	Interviews	Organization
Soja & Paliwoda-Pękosz 2009	Interviews	Project
Soja & Paliwoda-Pękosz 2013a	Interviews	Organization
Soja & Paliwoda-Pękosz 2013b	Interviews	Project
Soja & Put 2007	Survey	Project
Soja & Weistroffer 2014	Survey	Project
Themistocleous et al. 2011	Interviews	Project
Zarzycka 2012	Case study (multiple companies)	Organization
Ziembra & Obłąk 2013	Case study	Organization

Table 7. Data Source and Unit of Analysis

Surprisingly, only two investigations were conducted at the country level. Most studies (15) were at the organizational level, and ten studies were at the project level. Surveys seem to be the most widely used approach to data collection, followed by case studies and interviews. Only two studies used secondary data (reports).

Theoretical Foundation

As to theoretical foundation, we checked the papers for any explaining theory that was used as a foundation of the analysis conducted or for explanation of results. Only two papers out of our sample of 27 used an explaining theory, as shown in Table 8. This confirms findings by Roztocki and Weistroffer (2014) that few information systems studies conducted in or on transition economies make use of theories.

Theory	Application of Theory	Paper
Absorptive capacity theory	Explain organizational transformation due to enterprise system	Bernroider et al. 2011
Stakeholder theory	Explain enterprise system adoption	Soja 2011

Table 8. Theories Used

Outcomes

Themes and Trends in the Existing Literature

Only eight transition economies are represented in the 27 papers in our sample. In total, 38 authors contributed to these papers. However, one author contributed to 11 of the 27 papers, which explains in part the relatively large number of papers focusing on one country, namely Poland. Only two other authors contributed to more than one paper, though. The majority of the papers are written by a single author (11) or just by two authors (10). Only four papers in our sample are co-authored by researchers affiliated with institutions in different countries, and in each of these, only one of the countries was a transition economy, the other countries being western European countries or the USA. Consequently, most research has been conducted in the context of only one country, or involved a comparison between a transition economy and a Western country.

The studies have been focused mainly at the organizational and project level, using surveys, interviews and case study approaches. Very few published studies make use of explaining theories. Strategy seems to be the issue of greatest interest, followed by impact and diffusion.

Research Gaps and Opportunities for Future Research

An obvious gap in the existing research is geographic breadth. As pointed out above, most research has been conducted in the context of only a few countries. Another gap is research on country level as well as research looking at individuals, as most published studies have focused on organizations or projects. A third gap is the lack of theory development as well as use of theories to explain observed phenomena.

To further identify opportunities for future research, we looked at the specific recommendations given by the various authors in their papers. The results of this analysis are presented in Table 9. The first column gives our suggestions for future research, based on authors' comments shown in the middle column. The third column shows the corresponding references.

Organizational impact is one area where there are opportunities for further research. That is, what effect does an ES implementation and the accompanying changes on business processes have on the performance and culture of an organization. Another opportunity is looking more specifically at different types of ES implementation projects and the determining factors for success. There are also opportunities to incorporate a multiple stakeholder perspective in ES-related studies conducted in transition economies. Future works may incorporate viewpoints of various actors representing both adopters and providers. Determining success measures is another direction for possible further research. An obvious opportunity for additional work is geographic expansion of the research focus, as currently published studies were conducted in the context of only a very small number of transition economies. Research that compares ES implementations in different transition economies, as well as with developed economies is also needed.

Additional future directions for research may also involve investigating how EU membership influences the ES market in transition economies. Such an investigation could focus on various issues connected with both adopters' and providers' perspective and might also elaborate on the role of global ES providers. Results of a study by Dobija et al. (2012) indicate that global ES providers enjoy clear competitive advantage over the local software providers in transition economies that are now members of EU. Thus, it may be useful to investigate how EU membership has shaped the ES market, who the main beneficiaries are, and how the situation is likely to evolve in the future.

Future Research Opportunities	Quotations from Source Articles	Paper
Organizational impact	"Future research might investigate more in depth the organizational transformations related to ERP implementation, nuancing the success of the process and illustrating the variety of organizational practices."	Dumitru et al. 2013
Project types specific ES implementation issues	"The problems demonstrated in this article portray the need for further research on the mechanisms determining ES implementation outcome depending on the project type, with the possible introduction of additional criteria."	Soja 2009
Multiple stakeholder perspectives and changes of success determinants over project stages	"Other directions may concentrate on incorporating a multiple stakeholder perspective and investigation as to how determinants and their interrelations change over project stages." "... future research may be connected with an in-depth stakeholder analysis of the experienced difficulties with the purpose of discovering the mechanisms useful in better stakeholder management during the ES adoption projects."	Soja 2010 Soja and Paliwoda-Pekosz 2013b
Develop success measures	"... future studies may employ a success measure in the analysis of investigated projects which should allow us to discover the influence of determinants on ES adoption success." "... future studies may focus on examination of the influence of the experienced difficulties on ES adoption success."	Soja 2011 Soja and Paliwoda-Pekosz 2013b
Verification and expansion of proposed ontology	"This study also offers a preliminary framework ... as a starting point for building the comprehensive ontology of ES adoption benefits and, in the long run, the general ontology of ES adoption."	Soja and Paliwoda-Pekosz 2013a
Expanded geographic scope	"In consequence, we should generalize the results for other countries with caution. Supposedly, the scope of this study's findings should cover countries from Central and Eastern Europe..."	Soja and Paliwoda-Pekosz 2013b
Causal structures and interrelationships of impediments to ES implementation	"The findings suggest some avenues for further research which may focus on investigating the causal structure and mutual relationships among the discovered impediments."	Soja and Paliwoda-Pekosz 2013b
Examine industry factor in ES implementation	"The results also suggest further research on the projects' conditions depending on a company's industry."	Soja and Put 2007
More extensive surveys in multiple transition economies	"... further research is planned to verify the presented framework with the help of an extensive survey conducted in several transition economies."	Themistocleous et al. 2011
Examine effects of ES on accounting system	"... further research is needed to determine whether or not the introduction of an ERP system makes a management accounting system change."	Zarzycka 2012
Best practices in ES implementation	"There is a need to conduct more in-depth research into ... 'best practices' to be used to successfully manage ERP implementation ..."	Ziemia and Oblak 2013

Table 9. Future Research

Limitations and Conclusions

The main limitation of our study is the rather small number of articles reviewed, which may skew some of the observations. As more research on ES in transition economies is being conducted, a more expansive review will be warranted.

Moreover, in a future review we may widen the scope of our analysis, using the framework developed by Soja and Cunha (2015), and examine papers in the expanded sample of studies on ES in transition economies for such aspects as strategic role, level of use, need for external support, project planning, and resource availability. Also the people-related element, the so-called "fragile human capital" (Soja 2011; Soja and Paliwoda-Pekosz 2013) should be subject to future attention. In addition, in future research we may examine the effects of information transparency of the ES (Al-Jabri and Roztocki 2015).

We believe that our initial literature review makes a substantial contribution to the existing body of knowledge, being to the best of our knowledge, perhaps the first systematic review of ES in transition economies. Based on our review we identified gaps in the existing research literature and point to promising future research avenues.

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