

**THE SOCIO-ECONOMIC DETERMINANTS
OF ENTREPRENEURSHIP IN ESTONIAN
RURAL MUNICIPALITIES**

**ETTEVÕTLUST MÕJUTAVAD SOTSIAAL-MAJANDUSLIKUD
TEGURID EESTI VALDADES**

ANNE PÕDER

A Thesis
for applying for the degree of Doctor of Philosophy in Agriculture

Väitekirj
filosoofiadoktori kraadi taotlemiseks põllumajanduse erialal

Tartu 2017

Eesti Maaülikooli doktoritööd

**Doctoral Theses of the Estonian University of Life
Sciences**

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Institute of Economics and Social Sciences
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LIST OF ORIGINAL PUBLICATIONS

The present thesis is a synthesis of the following publications, which will be referred to in the text by their respective Roman numbers.

- I Viira, A-H., **Põder, A.**, Värnik, R. 2009. 20 years of transition – institutional reforms and the adaptation of production in Estonian agriculture. *German Journal of Agricultural Economics* 58(7): 286–295.
- II Viira, A-H., **Põder, A.**, Värnik, R. 2013. The determinants of farm growth, decline and exit in Estonia. *German Journal of Agricultural Economics* 62(1): 52–64.
- III **Põder, A.**; Nurmet, M.; Värnik, R. 2011. Entrepreneurial activity in rural municipalities of three South-Eastern Estonian counties in 2005–2009: a cluster analysis. *Proceedings of the International Scientific Conference Economic Science for Rural Development* 26: 182–191.
- IV **Põder, A.** 2012. Entrepreneurial activity in Western Estonian rural municipalities in 2006 and 2010: a cluster analysis. *Economics and Rural Development Research Papers*, 8(1): 32–42.
- V **Põder, A.**, Nurmet, M. 2014. Estonian Rural and Urban Enterprises' Investments in Fixed Assets and Changes in Sales Revenue from 2005 to 2010. *Proceedings of the International Scientific Conference Economic Science for Rural Development*. Jelgava: Latvia University of Agriculture 35: 182–188.
- VI **Põder, A.**, Viira, A.-H., Värnik, R. 2017. Firm entries and exits in Estonian urban municipalities, urban hinterlands and rural peripheries 2005-2012. *Journal of Baltic Studies*, 48 (3): 285–307. DOI 10.1080/01629778.2016.1210661.

The contribution of the author to the papers is as follows:

Paper	Original idea and design	Data collection	Data analysis	Manuscript preparation
I	AHV, AP, RV	AHV, AP, RV	AHV, AP	AHV, AP, RV
II	AHV, AP, RV	AHV, AP	AHV, AP	AHV, AP, RV
III	AP, MN	AP	AP, MN	AP, MN, RV
IV	AP	AP	AP	AP f
V	AP, MN	AP, MN	AP, MN	AP, MN
VI	AP	AP	AP; AHV	AHV, AP, RV

AP – Anne Põder; AHV – Ants-Hannes Viira; RV – Rando Värnik; MN – Maire Nurmet

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ABBREVIATIONS

ARIB	Estonian Agricultural Registers and Information Board
CAP	Common Agricultural Policy
CEEC	Central and Eastern European Countries
EMA	Estonian Ministry of Agriculture
EU	European Union
ERDP	Estonian Rural Development Plan
GEM	Global Entrepreneurship Monitor
SAPARD	Special Accession Programme for Agriculture and Rural Development
SE	Statistics Estonia
SME	Small and medium-sized enterprises

1. INTRODUCTION

Entrepreneurship is often emphasised as one of the key driving forces behind economic growth (Acs *et al.* 2004; Audretsch, Keilbach 2004; Bosma, Schutjens 2007; Tominc, Rebernik 2007; Minniti 2008). Entrepreneurship creates new enterprises and jobs, economic growth and innovation, thereby facilitating the renewal of the economic fabric as well as contributing to structural, technological, social and organisational changes (Fayolle 2007). As it is believed that entrepreneurship is “a root dynamic of change” in economies and societies (Schoonhoven, Romanelli 2001, p. 2), entrepreneurship, its determinants and effects have attracted the attention of both policy and research. Entrepreneurship plays an essential role in helping regions adjust to economic changes (Commission of ... 2003; Barreneche-Garcia 2014). Estonia, especially its rural areas, has struggled with persistent regional differences in economic and social development; and for this reason, the spatial and socio-economic dimensions of entrepreneurship require attention.

Entrepreneurship does not develop in a vacuum (Shane 2003). Not only is the discovery of an entrepreneurial opportunity, and the establishment of an enterprise, affected by a number of socio-economic determinants, its subsequent performance is too. Economic factors, such as markets, macroeconomic development, natural resources, human and technological capital as well as geographical space affect entrepreneurial activities (Cuervo 2005). Besides from these, the institutional environment, incl. economic context, political system and socio-cultural factors, impact people’s willingness to engage in entrepreneurship (Shane 2003).

The aim of the present thesis is to study the impact of socio-economic determinants on the development of entrepreneurship in Estonian rural municipalities. The socio-economic determinants refer to external economic, social, spatial and institutional factors. The determinants studied in the thesis do not include factors of natural environment.

The thesis is a synthesis of six papers (I–VI), which study different aspects of entrepreneurship and its determinants in Estonian rural areas since the transition from planned economy to market economy.

Papers I and II provide an overview of the most important developments in Estonian agriculture and rural economy in the last 25 years and study the factors that have driven farm exits and structural change in agriculture and shaped the environment for entrepreneurship in rural municipalities.

In Papers III–VI, the main focus is on the time period following EU accession, during which Estonia went through high economic growth, decline and the first years of slow economic recovery. The thesis explores how the economic climate and demographic and socio-economic environment impacted entrepreneurship in different types of local municipalities (III, IV, VI). Paper VI studies the differences in enterprise entry and exit patterns between rural municipalities located in urban hinterland and municipalities in rural periphery and then compares them with urban centres. In Paper V, financial indicators – urban and rural enterprises’ investments and sales revenues – are compared. The spatial level at which entrepreneurship is measured is local municipality (III, IV, VI) or urban/rural dichotomy for the whole country (V).

The present thesis seeks to contribute to the growing body of research on the regional variation of entrepreneurship and on the effects of socio-economic environmental factors on entrepreneurship and SMEs. Mainstream entrepreneurship research is mostly focused on the personality characteristics of entrepreneurs and individuals’ willingness to become entrepreneurs (Backmann, Karlsson 2013). Too often it neglects to take into account that the available entrepreneurial opportunities at each point in time vary between regions (Karlsson, Gråsjö 2013). In Western countries, the regional variation of entrepreneurship and its determinants have been addressed by an increasing body of research (Storey 1984; Mason 1991; Reynolds *et al.* 1994; Kangasharju 2000; Nyström 2005; Sternberg 2009, 2011; Brown *et al.* 2013; Backmann, Karlsson 2013; Bosma, Sternberg 2014; Delfmann *et al.* 2014; and Westlund *et al.* 2014, among others). In Estonia, the regional context of entrepreneurship has so far received more limited attention. New firm formation in different Estonian counties, the impact on jobs and entrepreneurship policy has, for example, been studied by Venesaar (2006) and Venesaar and Marksoo (2006). Since 2012, Estonia has also participated in the Global

Entrepreneurship Monitor (GEM), which studies entrepreneurial activities, attitudes and aspirations in the population. Estonian GEM reports conducted in 2012, 2013 and 2014 (Arro *et al.* 2012, Venesaar *et al.* 2013, Elenurm *et al.* 2014) published the breakdown of data according to regional and rural/urban levels, but to the author's knowledge no more detailed analysis on the impact of the regional context and on rural entrepreneurial activities has been published on the basis of further analysis of this data.

The three surveys conducted to provide input for Estonian Rural Development Plans (ERDPs) in 2002 (Sudakova Kalvist 2002), 2006 (Majandus- ja sotsiaalinstituut ... 2006) and 2012 (Institute of Economics ... 2012) give a general overview on the enterprises registered in Estonian rural municipalities, but they lack a more detailed analysis on the impact of regional development on entrepreneurship and SMEs. This type of analysis on the variation of entrepreneurship development patterns and on the impact of different socio-economic determinants on entrepreneurship in different types of rural municipalities has not previously been undertaken on Estonian data.

The development of agriculture during the transition in the 1990s has been reviewed by a number of researchers (Maide 1995; Unwin 1997; Kaubi 1999; Swinnen 1999; Alanen 1999, 2004; Alanen *et al.* 2001; Tamm 2001; Virma 2004; and Uint *et al.* 2005, among others). Papers I and II extend the period studied and contribute to the understanding on what happened during the early 2000s and in the present decade in agriculture, and how this impacts the environment for rural entrepreneurship. Farm exits and succession continue to be highly significant for the future of rural areas, and have been studied by many researchers for this reason (Weiss 1999; Kimhi 2000; Kimhi, Bollmann 1999; Gale 2003; Glauben *et al.* 2004; Väre 2007, Väre *et al.* 2010; Breustedt, Glauben 2007; Calus *et al.* 2008; and Viira 2014, among others). The study in Paper II tries to address the gap in research on the drivers of farm exits and structural change in agriculture in Estonia. As this continues to impact economic and regional development, the present analysis has practical value for policy makers who have to address the ongoing developments in agriculture and in rural areas that are socio-economically lagging behind, and promote entrepreneurship with suitable policy measures.

The limitation of the present research is that the socio-economic determinants studied in this thesis are confined to a number of select factors, e.g. it does not include more detailed research on the effects of taxation, legislation, education, culture and values, among other things. The selection of variables has been confined by the availability of data and suitable empirical indicators. The socio-economic factors studied in different papers include institutional change and agricultural restructuring, macroeconomic climate, population change, local incomes, unemployment, characteristics of local businesses, location and other factors.

The thesis is structured as follows. Chapter 2 provides the theoretical framework and discusses the definition of entrepreneurship along with the socio-economic determinants of entrepreneurship. Also, a general overview on the transition from planned economy to market economy in CEECs is given. Chapter 3 explains the aim of the thesis and hypotheses. Chapter 4 gives an overview on the study designs, data and methods used for research in the six published papers. Chapter 5 provides results of studies presented in Papers I–VI. Chapter 6 contains the discussion. Chapter 7 provides the main conclusions and recommendations for policy makers and further research.

2. THEORETICAL FRAMEWORK

2.1. Definition and measurement of entrepreneurship

Entrepreneurship itself is a multi-faceted concept with a variety of approaches used in empirical and theoretical research (Low, McMillan 1988; Van Praag 1999; Reynolds *et al.* 2005; Sternberg 2011; Delfmann *et al.* 2014). However, there is no general consensus on how to define and characterise entrepreneurship (Lumpkin, Dess 1996; Audretsch, Thurik 1998; OECD 1998). The researchers typically view entrepreneurship and its occurrence as a result of various individual, organisational and environmental factors (Lumpkin, Dess 1996). Shane and Venkataraman (2000) stress that the field of entrepreneurship examines why, when, by whom and how profitable opportunities to create goods and services are discovered, evaluated and harnessed. Stevenson and Jarillo (1990) divide studies of entrepreneurship into three categories: studies on *what* happens when entrepreneurs act; research on *why* entrepreneurs act and studies on *how* entrepreneurs act. In the present research, the main focus is on the impact of the surrounding socio-economic environment (institutional change and agricultural restructuring, demographic changes, local incomes, local unemployment, economic recession, location and other factors) on entrepreneurship in Estonian rural areas. For this reason, it could be placed in the category of studies that focus on *why* entrepreneurs act, as such studies examine the impact of individual characteristics and environment on entrepreneurship.

With the lack of a single, generally accepted definition, entrepreneurship research is characterised by a broad spectrum of definitions, ranging from very narrow to very broad definitions (Sternberg 2009). In colloquial use, entrepreneurship mostly refers to “*owning and managing a business on one’s own account and risk*” or to “*entrepreneurial behaviour in the sense of seizing an economic opportunity*” (Sternberg and Wennekers 2005, p. 193).

Historically, there have been diverse opinions in economic literature on the nature and role of the entrepreneur (Herbert, Link 1989; Van Praag 1999). Herbert and Link (1989, p. 41), in summarising the main roles of

the entrepreneur, divide them into static and dynamic theories (Table 1).

Table 1. Definitions of an entrepreneur in economic literature. Source: constructed on the basis of Herbert, Link 1989, p. 41; Wennekers, Thurik 1999, p. 31

Type of definition	Definition of an entrepreneur
Dynamic	A person who assumes the risk associated with uncertainty
	An innovator
	A decision maker
	An industrial leader
	An organiser and coordinator of economic resources
	A contractor
	An arbitrageur
	An allocator of resources among alternative uses
	A person who realises a start-up of a new business ¹
Static	The supplier of financial capital
	A manager or a superintendent
	An owner of an enterprise
	An employer of factors of production

Wennekers and Thurik (1999, 46–47) suggest defining entrepreneurship as the individuals’ “*manifest ability and willingness*” to “*perceive and create new economic opportunities*” and to “*introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions.*” Individuals can operate on their own or in teams or partnerships and within or outside of existing organisations.

Many researchers distinguish between “real” or “Schumpeterian” entrepreneurs and managers, who can either be employees or managerial business owners, and who make up the majority of firms (Wennekers, Thurik 1999). Schumpeter (1934, 1942) viewed the entrepreneur as an innovator, who creates changes within markets through the carrying out of new entrepreneurial combinations (new markets, new production and transportation methods, new forms of industrial organisation, etc.). In the process of “creative destruction”, the economic structure is constantly transformed by new enterprises that introduce new combinations while destroying the old ones. The

¹ This was added by Wennekers, Thurik 1999

competitive firms become more productive, while the resources of the uncompetitive ones that exit are released (Bosma *et al.* 2011).

The new entry – “*entering new or established markets with new or existing goods or services*” – is “*the essential act of entrepreneurship*” (Lumpkin, Dess 1996, p. 136). An enterprise is a vehicle for entrepreneurship. The role of entrepreneurs in creating economic growth stems from the creation or operation of new enterprises, whether the activities for those are innovative or not; and from transforming new ideas and innovations into economically viable entities (Baumol 1993; Wennekers, Thurik 1999). New and small firms provide opportunities for trying out new and previously unexplored ideas (Audretsch, Thurik 1998). Small firms are not synonyms for entrepreneurship, but they are one of the vehicles by which individuals can realise their entrepreneurial ambitions (Wennekers, Thurik 1999). The focus on novelty as the activity is usually defined as entrepreneurial when it applies new knowledge or uses existing knowledge in new ways (Henrekson, Roine 2007). New ideas and responsibilities can be implemented also in existing organisations through corporate entrepreneurship (Wennekers, Thurik 1999).

Measuring entrepreneurship empirically can be quite complicated, as there is no consensus on what would be practical and reliable indicators (OECD 1998). Part of the issue is that it is difficult to translate the classic concepts of entrepreneur into empirically testable equivalents (Van Praag 1999). The number of new start-ups, turnover of firms, SMEs² in which owners and managers are the same; fast-growing firms, whether new or established; high-tech firms, etc. are all used to empirically measure entrepreneurship (OECD 1998).

New business start-ups or self-employment are the most common empirical measures in the mainstream of entrepreneurship research (Westlund 2011). This is despite the fact the many authors in theoretical literature emphasise that not all new entries, small businesses, self-employed persons, etc. are entrepreneurial. However, it is difficult to make distinctions without a large amount of additional background data – for example, from statistical data on entries, SMEs or business

² In the EU, enterprises with fewer than 250 employees and with an annual turnover of no more than 50 million or a balance sheet total of no more than 43 million are considered to be SMEs (European Commission 2003).

owners, etc. – between who is an entrepreneur and who is not. As Gartner (1989) stresses, it is not only difficult to differentiate the psychological traits, motives and goals of entrepreneurs and managers, as it is also difficult to determine which firms, products or methods count as innovative, their degree of innovativeness and for how long. Audretsch, Thurik (1998) and Carree *et al.* (2002) also emphasise that most of the business owners are obviously neither pure “Schumpeterian” nor this managerial “shopkeeper”, but they have the components, motives and attitudes of both to a varying degree.

The present thesis studies entrepreneurship in rural municipalities. Baumgartner *et al.* (2013a) summarise that there are two main approaches to how rural entrepreneurship is conceptualised. One approach is that “rural entrepreneurship” is something distinctive from entrepreneurship in urban areas, because the specific attributes of the rural environment shape the entrepreneurial process itself. Another approach does not view “entrepreneurship in rural areas” as something different from that in urban areas. The specific characteristics of rural areas merely describe the environment in which entrepreneurship takes place (Baumgartner *et al.* 2013a).

2.2. Determinants of entrepreneurship

Research on the causes of entrepreneurship can be divided into two camps: individual-centric approaches that study entrepreneurial individuals and their characteristics; and environment-centric approaches that research the impact of external forces on entrepreneurship (Shane 2003).

In the research focusing on individuals, the entrepreneur is the basic unit of analysis and its traits, characteristics and differences from non-entrepreneurs are viewed as the key to explaining entrepreneurship (Gartner 1989). A willingness to take risks and to bear uncertainty, creativity, independence, need of achievement, locus of control, values, certain socio-demographic characteristics, etc. are examples of traits associated with entrepreneurs in research publications (Shane 2003;

Gartner 1989; Low, McMillian 1988; Stevenson, Jarillo 1990; Grilo, Thurik 2008).

Environment-centric approaches aim to explain entrepreneurial activity by their surrounding environment (Shane 2003). In those approaches, entrepreneurial activity depends on economic determinants such as the macroeconomic and financial environment, industry and markets, geographical space, and on institutional factors such as institutions and political systems, culture, education, knowledge and others (Cuervo 2005). Environmental determinants are important because they do not simply open up opportunities for harnessing; they also determine how conducive different environments are to entrepreneurship (Stevenson, Jarillo 1990).

Figure 1 presents Cuervo's (2005) summarisation of different levels of analysis and is based on the conceptual framework proposed by Shane (2003). Shane (2003) views entrepreneurial activity as the directional process of several activities that are all influenced by both individual and environmental factors.

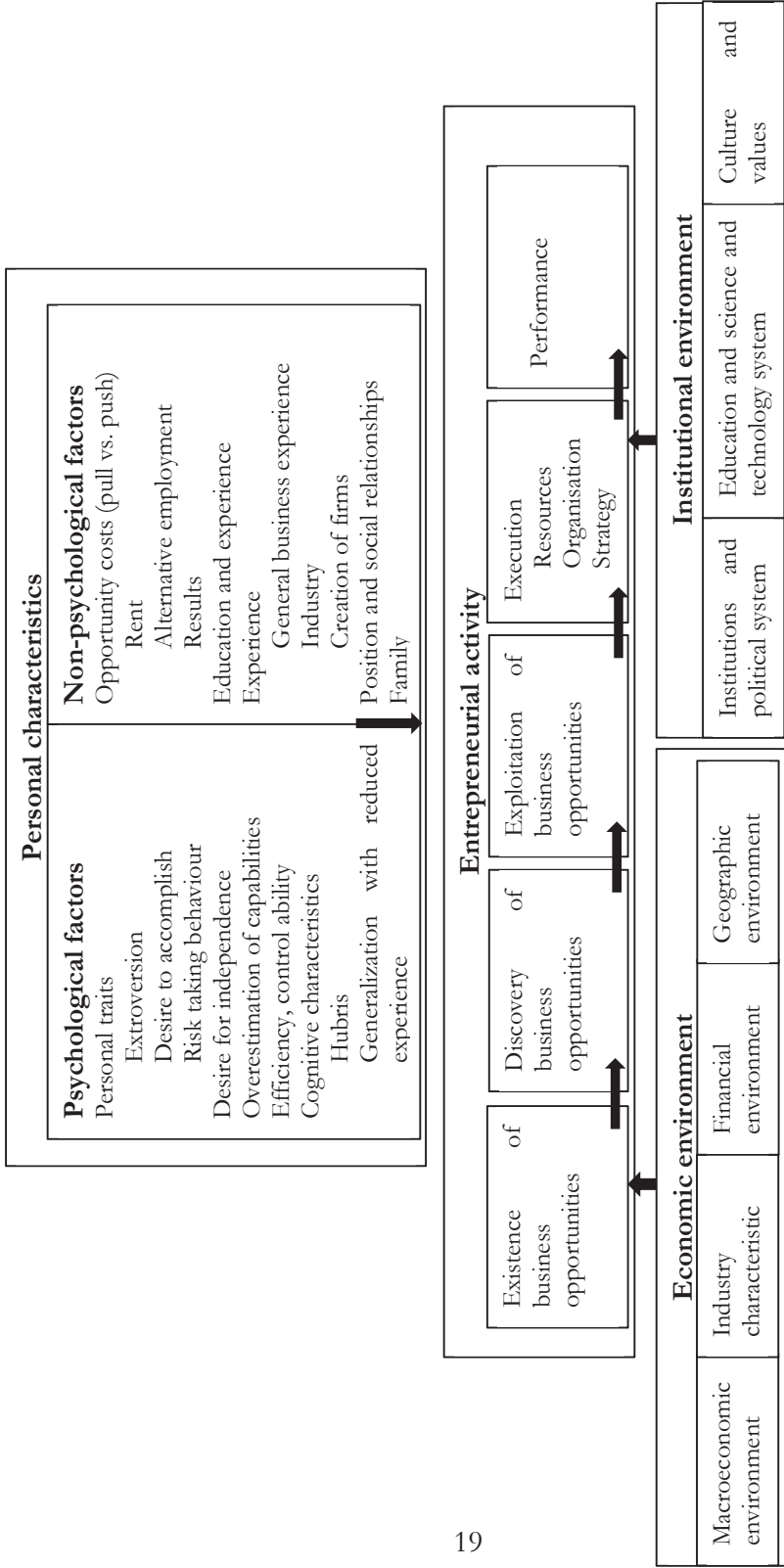


Figure 1. Entrepreneurial process and individual and environmental determinants. Source: adapted from Cuervo 2005, p. 299 and Shane 2003, pp. 11–12 with minor changes.

A number of studies (Verheul et. al. 2001, 2002; Nyström 2005; Wennekers et. al. 2005; Bosma *et al.* 2008 etc.) discuss the determinants of entrepreneurship through demand and supply. The demand side refers to opportunities for entrepreneurship that are influenced by technological development, globalisation, economic growth, changes in consumer demand and changing industrial structures (Verheul et. al. 2001, 2002). The supply side provides potential entrepreneurs that can seize opportunities and includes elements such as the demographic structure of the population, population change, density, attitudes towards entrepreneurship, the resources and abilities of people, level of income, etc. (Verheul *et al.* 2001).

In order to understand the individual or environmental determinants of entrepreneurship, it is vital to consider the context. The contextual views on entrepreneurship study economic behaviour within its historical, temporal, spatial, social and institutional contexts (Welter 2011). Context refers to “*the set of circumstances in which phenomena (e.g. events, processes or entities) are situated*” (Griffin 2007, p. 860). Context describes the circumstances, environments, conditions and situations that are external to the phenomenon studied and that can enable or constrain it (Welter 2011).

The focus of the present research is on the socio-economic context of entrepreneurship in Estonian rural municipalities. In the following sections, the impact of selected socio-economic factors is briefly discussed.

2.2.1. Economic environment

The size of an economy and its growth, economic stability (e.g. inflation), fiscal system, taxation policy, etc. are macroeconomic factors that influence entrepreneurship (Cuervo 2005). Several studies (Audretsch, Acs 1994; Audretsch 1995; Mata 1996; Storey 1999; Carree et. al. 2002; Acs *et al.* 2012, among others) have connected economic growth with the extent of entrepreneurial activities. Greater societal wealth and economic stability indicate favourable conditions, including strong demand for goods and services and better financing

opportunities to encourage individuals to establish businesses (Shane 2003).

However, the links between economic stability, growth and entrepreneurship are not always as clear-cut. Increased wages and improved social security also raise the opportunity costs for entrepreneurship (Verheul *et al.* 2002, Bosma *et al.* 2008). Low wages can push people who are not satisfied with their income level into establishing their own firms (Ejeremo, Xiao 2014). High wages and fewer risks would make being an employee a more attractive choice. Consequently, entrepreneurship would increase at a time of economic downturn, as unemployment, lower labour and equipment costs, niches opened by failing firms, etc. would provide potential entrepreneurs with new opportunities (Ilmakunnas, Topi 1999). At the same time, high economic volatility and high inflation would indicate higher risks and uncertainties about long-term contracts and recuperating investments (Arin *et al.* 2015).

Unemployment is one issue that is strongly intertwined with economic growth and stability. However, research on the effects of unemployment also shows an ambiguous impact. One side of the argument is that unemployment pushes people to entrepreneurship because of dismal employment prospects and the relatively low opportunity costs (Blau 1987; Storey 1991; Evans, Leighton, 1990; Blanchflower, Meyer, 1994; Johnson, Parker 1996; Verheul *et al.* 2001, Thurik *et al.* 2008). However, high unemployment also indicates weak economic growth and leads to fewer entrepreneurial opportunities; this in turn has a negative impact on entrepreneurship (Reynolds *et al.* 1994; Audretsch 1995; Carree 2002; Verheul *et al.*,2002; Bosma *et al.* 2008; Thurik *et al.* 2008). Unemployment is often connected with a lower level of human capital, entrepreneurial skills (Thurik *et al.* 2008) and personal wealth (Johansson 2000).

The establishment of enterprises and their success are also dependent on the particular conditions of the industry in which they operate. Also, the fiscal system, especially government policies on the taxation of capital gains, business profits, etc., and the financial system, especially the availability and cost of capital, shape the economic environment (Cuervo 2005).

2.2.2. Regional dimension

Parker (2009) asserts that all major economies are characterised by regional differences in the rates of entrepreneurship, irrespective of whether it is measured on the level of administrative regions, labour market areas, cities or neighbourhoods. The regional variation of entrepreneurship rates has been addressed by a growing body of research that focuses on the spatial dimension of entrepreneurship (including Feldman 2001; Armington, Acs, 2002; Parker 2005; Bosma *et al.* 2008; Sternberg 2009; Bosma, Sternberg 2014; Brixy 2014).

The spatial aspects of entrepreneurship can be analysed on different levels: supra-national, national, regional, local level (Bosma, Sternberg 2014). Trettin and Welter (2011) argue that research on lower spatial scales, such as local, would provide better insights into the interrelation of social processes and entrepreneurship. Stam (2007) emphasises that entrepreneurs usually set up their firms where they live or work, as they have knowledge of the local markets, their personal networks are located in those areas and capital constraints in the start-up phase usually limit their locational behaviour.

The spatial variation of industry characteristics, population density and income levels, among other factors, also have an impact on how favourable a particular region is to entrepreneurship. Positive agglomeration effects emerge in areas with high enterprise and population density (Van Stel, Suddle 2008). The growth of population and local incomes expands the local consumer market and create more demand for new diverse products and services, thereby having a positive effect on entrepreneurship (Armington, Acs 2002; Verheul *et al.* 2002; Wennekers *et al.* 2005). Positive agglomeration effects also stem from better access to capital, labour, service and input markets; cooperation opportunities and knowledge spillovers from research institutions and other enterprises (Reynolds *et al.* 1995; Agrawal 2002; Werker, Athreye 2004; Fritsch, Mueller 2007). However, there are also negative agglomeration effects like higher competition (including competition for labour and land), inputs that push up costs, traffic congestion and environmental pollution (Richardson 1995; Nystörm

2005; Bosma *et al.* 2008). While there are negative aspects, such as high living costs, competition that drive up the costs of firm entry, the advantages of large, heterogeneous and diversified urban economies usually outweigh the disadvantages (Bosma, Sternberg, 2014).

In comparison with urban counterparts, enterprises in rural areas usually lack opportunities to utilise the benefits from agglomeration economies (Besser, Miller 2013). Enterprises in rural areas typically have to face limited local consumer demand, distance from markets, suppliers and skilled labour, other enterprises, infrastructural deficiencies, etc. (Smallbone *et al.* 2002; Smallbone et al 2003, Smallbone 2009, Besser, Miller 2013). A decrease in the local population, which is generally an issue for rural areas, usually has a negative impact on entrepreneurship. However, Delfmann *et al.* (2014) emphasise that new opportunities may still emerge and certain level goods and services be required; therefore, entrepreneurship can play an important role in maintaining the quality of life in those regions.

2.2.2. Institutional environment

Institutions constitute established and accepted sets of norms, rules and procedures that define and influence how society operates (Garside 2007). They include both informal constraints (values, norms, taboos, traditions, customs, sanctions, codes of conducts, etc.) and formal rules (constitutions, laws, property rights, contracts) that structure political, social and economic interactions in a society (North 1991). Scott (2014) emphasises that institutions constrain behaviour as they set legal, moral and cultural boundaries, distinguishing between acceptable and unacceptable behaviour.

Formal constraints consist of the regulative elements such as laws, regulations and government policies that can facilitate or inhibit entrepreneurship (Veciana, Urbano 2008). Entrepreneurship can only be productive when certain institutions are in place (Boettke, Coyne 2007), e.g. property rights that regulate rights to own and contract for assets (Shane 2003). The rules of the game affect the payoffs from different entrepreneurial activities, so they determine if the

entrepreneurial behaviour takes a productive or unproductive direction (Baumol 1990).

While the incentive system for entrepreneurship is formally regulated by governmental rules and their enforcement, it is rooted in the prevailing culture and social norms (Baumol, Strom 2007). Informal constraints rise from norms, values and attitudes in society, and they influence how and by whom entrepreneurial opportunities are recognised and exploited (Welter 2011). Social norms, cultural beliefs and attitudes that find entrepreneurship socially acceptable and desirable encourage people to become engaged in entrepreneurship (Shane 2003).

2.3. Transition to a market economy in CEECs

2.3.1. Transition to a market economy and institutional change

Transition economies is a term used to refer to countries, incl. CEEC, that transitioned from centrally planned economies to market economies (IMF 2000).

The characteristics of the Soviet economy included the state ownership of most property and assets, central planning, control and distribution that resulted in an economy focused on large, vertically integrated monopolies concentrated in heavy industry (Bliss, Polutnik 2007). Misallocation and misuse of resources (Nagy 1992, Gaddy, Ickes 2013), a centrally set and badly distorted pricing system (Clague 1992, Bliss, Polutnik 2007), disregard for consumer interests and a lack of competition resulted in poor quality products, limited variety and constant shortages (Nagy 1992), and these were common problems. The shortages contributed to the prospering of a second economy. The term second economy refers to income generating activities carried out by individuals and households outside of the state controlled organisations (Davis 1987). The second economy included both small-scale informal private activities as well as outright criminal activities.

By the mid-1980s, the Soviet economy had reached stagnation. The implementation of the *perestroika* economic policies by Gorbachev attempted to restructure the Soviet economy, but events escalated due to the worsening of the economic situation and the breakdown of central control; these led to the Soviet Republics re-establishing their independence and the collapse of the Soviet Union in 1991 (Myant, Drahokoupil 2011).

The main aspects of the economic transition to market economy included macroeconomic stabilisation, market reform and the removal of price controls, enterprise reform and restructuring in order to create a private sector, institutional reform in order to develop institutions suitable for democratic society, private ownership and a market economy (Summers 1992, Szentes 1994, Kostinskiy 2001, Smallbone, Welter 2009).

Privatisation – the process of transferring ownership rights from the state to private hands – was one of the principal components of the transition (Stark 1993). Winiecki (1997) emphasises that privatisation does not consist of a simply change of ownership of state enterprises, as it also includes the creation of new private enterprises and the expansion of already existing privately owned enterprises, which were a vital source of private sector growth. Institutional reform included the redefinition of the role of state, implementation of a raft of legal and regulatory reforms, and restructuring and reforming the tasks of government institutions (Summers 1992).

The collapse of the centralised economic system inevitably caused chaos (Kostinskiy 2001), and all of the transition countries saw a considerable decline in GDP in the early stages of transition (Myant, Drahokoupil 2011). Growing unemployment, rapid income differentiation, high inflation, indebtedness, the collapse of previous social security system, disintegration of previous social value systems, a rise in nationalism, degradation of the natural environment and other factors posed other sets of interlinked challenges at the same time (Szentes 1994).

The CEEC was characterised by rapid liberalisation, macroeconomic stabilisation, privatisation and institutional change. By the second half of the 1990s those countries were recovering from the transition related

recession (EBRD 1999). The beginning of the 2000s was characterised by preparation for EU accession, as seven former Eastern Bloc countries were among the 10 new member states to join the EU in 2004. Since the end of the 1990s, the integration of CEEC economies to the EU has accelerated with a gradual removal of various economic and legal restrictions; implementations, reforms and adoption of rules and regulations to fulfil the conditions for accession (Commission of ... 2006). EU accession has been mentioned as one of the indicators that the transition of the CEECs to market economies was over; however, there are a variety of differing opinions on what the criteria would be for determining that the transition is complete (Lavigne 1999, Andreff 2004).

2.3.2. The transition in agriculture

Over the last number of decades, the decline in the number of agricultural producers and increase in the average size of remaining producers can be observed in many countries (Browne et al 1992; Gebremedhin, Christy 1996; Gale 2003; Lobley, Potter 2004; Breustedt, Glauben 2007; Calus et al 2008; Viira et al 2009, Viira 2014; Viira et al 2014; III). The structural changes have been linked to technological changes, the economy, global market forces and governmental policies (Huffman, Everson 2001). In recent decades in Estonia, the institutional reforms during transition and the overall economic context were the main drivers for structural change.

At the end of the Soviet era, the distribution of farmland in a number of CEEC countries was quite dualistic, with a great number of small plots existing alongside large collective farms that produced the majority of output (Sedik 2003). Small household plots were an important source of income for rural residents (Virma 2004). Selling the produce of small household plots was one type of private entrepreneurial activity that was allowed in Estonia.

The essential elements of the reform process of agriculture and the food industry included the liberalisation of prices and markets, a cut in agricultural producer and food consumption subsidies, macroeconomic

and institutional reforms to create the structures required by market economies; land privatisation and the transformation of inherited economic structure; de-monopolisation and privatisation of food processing and agricultural trade; and a rural financial system (Csaki 2008).

The restitution of farmland to pre-collectivisation owners was the most common land reform process in the CEEC (Rizov 2008). Land reforms involved two separate and often conflicting issues: the demand for 'historical justice' by pre-collectivisation landowners and the demand for socially equitable distribution to address the needs of current land users and the rural population (Swinnen 1999).

The agricultural reforms were conducted to de-collectivise agriculture, return and recompense the non-land assets forcibly nationalised in the Soviet era to the previous owners, privatise the assets of collective farms and create more efficient agriculture based on private farms (II).

The initial conditions in countries of the former Eastern Bloc on the path to market economy were also quite heterogeneous (Kazlauskiene, Williams 2008, Buchenrieder et al 2009), thereby affecting the specifics of the reforms and policies in individual countries. However, all countries suffered considerable economic recession despite the different economic policies implemented (Halmai, Vasary 2008). Issues such as the absence of private and public market-oriented institutions, disruption of historic trading networks, underdevelopment of the private sector, lack of knowledge on how to operate in the market economy and the collapse of many state-owned enterprises, among other issues, created deep and lasting economic distortions (Buchenrieder et al 2009). In the decade of the transition, agricultural production declined in CEEC countries (Sedik 2003, Alanen 2004, Csaki 2008).

At the end of the 1990s, as preparations for EU accession began in CEEC countries, rural areas gained more attention as accession countries had to adopt EU rural development and structural policies that were aimed at reducing inter-regional disparities (European Commission 2014). Prior to accession, the Special Accession Programme for Agriculture and Rural Development (SAPARD) was

implemented to help countries adjust to agricultural restructuring, accession requirements and legislation (Buchenrieder et al 2009). Following EU accession in 2004, the Common Agricultural Policy (CAP), including market regulations and subsidies, was introduced across all new member states (Swinnen et al 2015). With implementation of the CAP, considerable subsidies became available for agricultural production in CEEC and rural development projects. While it increased the incomes of agricultural producers and became an important source of revenue in the rural sector, the general trend of a decrease of the share of agriculture in GDP and employment continued (European Commission 2014). With EU funds, the overall situation of agricultural producers has considerably improved in comparison with the situation during the decade previous.

2.3.3. Re-establishment of private entrepreneurship in Estonia

In some CEECs (e.g. Poland, Hungary), certain forms of private entrepreneurial activities were allowed during the Soviet period and became part of the formal economy, while in others (e.g. Soviet republics) they were illegal (Smallbone, Welter 2001; Reiljan 2003; Cieřlik, Van Stel 2014). In Estonia, private entrepreneurship was illegal, with some small exceptions (e.g. agricultural household plots). The first steps towards recreation of private enterprises in Estonia were taken in the second half of 1980ies with legalisation of small state enterprises and private business activities in the form of cooperatives and self-employment (Kuura 2006a). Those were followed by legalisation of public limited companies in 1989 and other companies in 1990 (Kuura 2001).

Following the regaining of independence and monetary reform in 1992, the number of enterprises started to increase rapidly. By 1995, the number of enterprises was 30,000 (SE 2017). The privatisation of medium and large-scale state enterprises was carried out relatively fast, which contributed to the increase of private enterprises, and by 1995 90% of enterprises were in private ownership (Smallbone, Welter 2009). Large enterprises were often broken up into smaller entities during restructuring, and bankruptcies and the reduction of jobs in privatised

enterprises contributed to the decrease in the share of large enterprises in business stock and employment (Miettinen, Teder 2006).

Entrepreneurship in Estonia at the beginning of the transition period is characterised by a lack of state intervention and control, a lack of support structures and legislative gaps. Important events in creating the general legislative framework for private entrepreneurship were implementation of Taxation Act, Accounting Act and Commercial Code in 1995 (Miettinen, Teder 2006). However, overall regulation and oversight by the state continued to be relatively limited and tax avoidance, illegal activities and businesses existing only on paper were common in this transition phase (Kuura 2001, Nikula, Tchalakov 2013).

In the second half of the 1990s, the increase in the number of businesses continued at a somewhat slower pace reaching 46,000 enterprises by 2000 (SE 2017). The second half of the 1990s was characterised by an increase in state intervention along with supports and services for businesses, international projects and initiatives for the creation of business support structures, and attention to institutional harmonisation with EU regulations (Kuura 2006b).

3. AIMS OF THE STUDY

Given the importance of entrepreneurship as a source of employment and creator of economic wealth (Schoonhoven, Romanelli 2001; Fayolle 2007), the fostering of entrepreneurship has become one of the main strategies in addressing regional development disparities (Baumgartner et al 2013b). As considerable variance in the development of entrepreneurship between regions can be observed (Fritsch 2011), the impact that local and regional determinants have on entrepreneurship remains a relevant research topic. While economic growth and development critically depend on promoting entrepreneurship at all levels and stages of development and across all areas of economy and society (McCann 2015), both the factors that influence entrepreneurship and the effects of entrepreneurship are primarily felt locally and regionally before having an impact nationally (Sternberg 2011).

According to North and Smallbone (2006), given the profound effect that the impact of structural changes and the ongoing global processes have had on traditional economic activities in rural areas, entrepreneurship in peripheral rural areas requires attention. As the importance of agriculture in the rural economy keeps diminishing (OECD 2006) and with the ongoing structural changes in agriculture, the development of non-agricultural entrepreneurship and SMEs is vital for rural economic development.

The aim of the present thesis is to study the impact of socio-economic determinants on the development of entrepreneurship in Estonian rural municipalities. The socio-economic determinants studied are structural and institutional changes in agriculture, the macroeconomic environment and local economic (local incomes, unemployment, share of different sectors, share of sole proprietors) and demographic changes.

The main hypotheses are:

1. The main developments in Estonian agriculture after the restoration of Estonian independence and the high number of farm exits in the 2000s created a relatively unfavourable

environment for entrepreneurship in rural areas that has had a long-lasting impact on the rural economy (I, II).

2. The development of entrepreneurship has been significantly different in different types of rural municipalities (in more centrally located rural municipalities; the rural periphery and in different regions; III, IV; V; VI)
3. The local socio-economic and demographic determinants had a different impact on entrepreneurship in different types of Estonian rural municipalities following EU accession (III, IV, VI).
4. Economic growth and decline had a different impact on enterprise entries and exits in municipalities (III, VI).
5. The onset of the economic decline had a greater impact on the financial performance of rural SMEs than on urban enterprises (V).

The aim of the first study (Paper I) was to explore the background of agricultural reform and their outcomes and implications for the rural economy in different periods of transition. The objective of Paper II was to study the effects of socio-economic factors on farm exits. Paper III and IV aim to explore entrepreneurship and local development in the rural municipalities of specific regions in Estonia – South-Eastern Estonia and Western Estonia. Paper V focuses on a comparison of the financial behaviour of rural and urban enterprises from 2005 to 2010. The aim of Paper VI was to study non-agricultural firm entries and exits in Estonian municipalities in the period from 2005 to 2012 and the effect of economic and demographic determinants on the entries and exits in different types of municipalities. es.

4. MATERIAL AND METHODS

4.1. Study design

The present dissertation is based on six papers that utilise different research designs and concentrate on various aspects of entrepreneurship and SMEs in Estonian rural municipalities. Papers I–VI are based on quantitative methodology (Table 2).

Table 2. Research design and methodology

	Focus of the paper	Research design/ methodology	Unit of analysis/ geographic scale	Data source	Methods of analysis
I	Overview on institutional reforms and agricultural development in Estonia 1989–2009	Descriptive / quantitative	Nationwide	Statistical data	Descriptive, time series analysis
II	The effect of farm characteristics on farm growth, decline and exits 2007–2011	Analytical / quantitative	Individual farm	Farm surveys in 2007 and in 2011; ARIB	Multinomial logistic regression
III	Entrepreneurship and population development in rural municipalities in South-Eastern Estonia 2005–2009	Descriptive / quantitative	Local municipality	Statistical data	Hierarchical cluster analysis
IV	Entrepreneurship and local socio-economic development in rural municipalities of Western Estonia 2006–2010	Descriptive / quantitative	Local municipality	Statistical data	Hierarchical cluster analysis
V	Urban and rural enterprises' financial performance 2005–2010	Descriptive / quantitative	Nationwide	Rural entrepreneurship survey; statistical data	Descriptive
VI	The impact of local socio-economic developments on firm entries and exits 2005–2012	Analytical / quantitative	Local municipality type: urban, urban hinterland, rural periphery	Statistical data	Kruskal-Wallis test; Mann-Whitney test; fixed effect regression

4.2. Data collection and analysis

Several data sources and different methods have been used to study various aspects of entrepreneurship and SMEs in Estonian rural areas. The analysis in Papers I, III–VI uses secondary data – statistical data from Statistics Estonia (SE) databases (Table 2). Paper II combines results from farm surveys conducted in 2007 and 2011 with secondary data from the agricultural registry of the Estonian Agricultural Registers and Information Board (ARIB).

In the present thesis (I, II), the terms farm and agricultural producer are used interchangeably. Paper I is based on research review and time series data on agricultural holdings and production in Estonia in 1989–2008. The statistical data on agricultural productivity, production volume, farm structures, trade, etc. was used to discuss the impact of institutional changes.

Paper II studies the impact of farm and farmer characteristics on whether the farms remained in the agricultural sector or exited and on the changes of their farm size. The data was collected with a farm survey in 2007 and its follow-up in 2011, and it is combined with registry data from ARIB on farm size. Multinomial logit estimation was used to study the impact of farm and farmer characteristics on farm exit, decline and growth.

As the main focus on the present analysis is not on agricultural production, the results of data analysis of Paper I and Paper II are only briefly discussed. The present thesis mainly draws on the review of published research and analysis of institutional reforms in Paper I and II to explain the socio-economic realities in rural areas that create the environment for entrepreneurship.

Paper III and IV use statistical data on entrepreneurship and socio-economic developments in rural municipalities in three South-Eastern Estonian and four Western Estonian counties. Papers III and IV use the number of enterprises per 1000 inhabitants as an indicator of entrepreneurial activity. This approach is based on the “Estonian entrepreneurship policy 2007–2013” (MKM 2006) document, the Estonian development programme which set the goals and activities of

the government's entrepreneurship policy. South-Eastern Estonia is one of the most peripheral areas in terms of its distance to the capital as well as being the region with the lowest living standards and sharp demographic problems. In Paper III, the local development indicators studied are population, demographic labour pressure, and enterprise entry and exit rates.

The two main approaches used for the comparison of new firm entries across regions are ecological approach and labour market approach. The ecological approach standardises the number of firm entries relative to the existing population of business (Audretsch, Fritsch 1994). The labour market approach studies new entries in relation to the labour force (Armington, Acs 2002). In Paper III ecological approach is used for entry and exit rates.

Paper IV studies Western Estonian rural municipalities that are in regions with considerable contrasts. The Estonian islands are in periphery in terms of accessibility as there is considerable associated travel time due to the main connection with the mainland being by ferries. However, the islands provide an attractive living environment, are major tourism destinations and some areas in the islands have very high levels of entrepreneurship. The population density of Western Estonia is low, and one of the specific characteristics of the region is that the rural population has a higher share in the total population of the region than on the mainland (IV). Two counties of mainland Estonia are included as part of the Western Estonian region, including the town of Pärnu, which is a relatively large town in Estonian terms. The analysis in Paper IV studies population change, share of sole proprietors among economically active enterprises, share of different sector enterprises, income per employee and other factors.

Hierarchical cluster analysis aims to cluster the studied entities to a smaller number of relative homogenous groups that are distinct from other groups (Aldenderfer, Blashfield 1984). In papers III and IV, hierarchical cluster analysis is used to study what kind of typologies local municipalities form on the basis of the entrepreneurship and local development indicators.

The data used in Paper V for the comparison of financial indicators of urban and rural enterprises was retrieved from the Statistics Estonia database during the study “The Rural Enterprises’ Situation, Development Trends and Need for Support” (Institute of Economics ..., 2012). In the survey rural areas were defined as rural municipalities and towns with fewer than 4,000 inhabitants on the basis of the classification used in ERDP 2007–2013 (EMA, 2008). Thus, there is a difference in the definition of a rural area between Papers V and VI as the ten smallest towns in Estonia are included in the rural area in Paper VI, while they are classified as urban in Paper VI. The database of SE publishes annual data on companies’ financial indicators; however, it does not distinguish between urban and rural enterprises. As this kind of urban/rural comparison had not been done before on this data, a special order for data outtake had to be made for the rural/urban comparison. At the time of the data order, the most recent year for which financial data was available was 2010. The financial data is collected from companies (public and private limited companies, general or limited partnerships, commercial associations, and branches of foreign companies). The data does not include sole proprietors or enterprises whose main activity is financial intermediation. The data is solely gathered from enterprises that were economically active, i.e. that had turnover and expenditures (SE 2015). The paper compares investments into fixed assets and changes in sales revenues in urban and rural enterprises. The data on sales revenue include income from the sales of all products, goods and services; they exclude VAT and excises, along with subsidies. The investments into fixed assets include investments in buildings, land, equipment, machinery, vehicles, installations, construction, reconstruction, intangible fixed assets and investment properties (SE 2015).

Paper VI examines non-agricultural firm entries and exits in Estonian municipalities in the period from 2005 to 2012. Firm entry and exit rates are calculated on the basis of labour aged population in the municipalities, i.e. using the labour market approach. The analysis is focused on how the economic climate and local development affected entries and exits in different types of municipalities. In the period studied, there were 33 municipalities classified as cities and 193 as rural municipalities in Estonia. In order to study whether the entry and exit patterns differ between centrally located and peripheral rural

municipalities, rural municipalities were divided into 48 rural municipalities in the urban hinterland and 145 municipalities in rural periphery (Fig. I in Paper VI). Urban hinterland was defined as rural municipalities from which at least 30% of the workforce commuted daily to an urban centre (SE 2009).

For the data analysis, the Kruskal-Wallis and Mann-Whitney tests, the non-parametric versions of one-way analysis of variance and independent t-test, were used in Paper VI to compare whether the mean entry and exits rates were statistically significant in different municipality types. Panel data from the three types of municipalities were used in six fixed effect regression models in order to compare the effect of environmental determinants on entrepreneurship. The variables used for environmental determinants were the economic climate (economic growth period of 2005–2007, recession in 2008–2010 and volatile recovery in 2011–2012) and local development indicators (population density of municipalities, average income of an employee, unemployment rate) affected enterprise entries and exits. The income of an employee refers to the remuneration subject to social tax received by a resident of the municipality.

5. RESULTS

The present chapter presents the main findings from papers I–VI. In the first subchapter, the developments in agriculture since the transition are discussed. The second subchapter concentrates on entrepreneurship and SME development in Estonian rural municipalities in the period of 2005 to 2012.

5.1. Developments in agriculture from 1989 to 2012

In the Soviet period, the rural economy was driven by the economic activities in collective and state farms that provided agricultural employment as well as infrastructure, non-agricultural services and jobs (I, VI). In CEEC countries, agriculture played a more important role in the economy with a higher concentration of the population engaged in agriculture and living in rural areas (Csaki, 2008, Buchenrieder, Möllers 2011) The higher importance of agriculture in rural economy in comparison with Western Europe is demonstrated by the fact that half of the Estonian rural population was employed in the primary sector at the time of the collapse of the Soviet Union (III). By the middle of the 1980s, Estonian agriculture, which was characterised by the highest per capita milk and meat production and level of wages in the Soviet Union, was one of the most developed in the Soviet Union (I). The income level in rural areas prior to the beginning of the transition was relatively high, as wages were supplemented by selling the produce of small individual plots and the second economy. As collective and state farms also provided numerous services in rural areas, they were also a main source of non-agricultural employment (I, VI).

After the passing of regulations in 1988 and the Farm Law in 1989, which permitted the establishment of the first private farms, 828 private farms were established within a year (Virma 2004; I, II). The future outlook for private farms was relatively positive, as new farms still had access to the structures and resources of collective farms. Also, supports for infrastructure development, subsidised inputs and services were available, thereby spurring the establishment of private farms (I). In the

following years, however, the situation radically changed, as the previous Soviet trading system, markets and subsidies disappeared.

Estonia regained its independence in 1991 and continued the transition to a market economy. The Ownership, Land and Agricultural Reforms Acts in 1991 and 1992 set the conditions for restitution or compensation of collectivised property for pre-collectivisation owners and their heirs and for the privatisation of collective property (I; II).

With the liquidation of collective farms, privatisation of their assets and progression of land reform, the number of private farms increased rapidly in the second half of the 1990s (I, II). The decisions to restore family's farm continued to be driven by non-monetary values and the economic considerations received less attentions (Hedin 2005) People re-establishing farms in Estonia were motivated by opportunity to return their ancestral homes and traditional lifestyles and encouraged by political idealisation of pre-Second World War family farms (Kelam 1993, Alanen 2004, I, II). In most cases the new farmers were unprepared for the realities of running of small farm in rapidly changing economic and political conditions (I, Tamm 2001) and lacked the wide set of skills and training necessary for not only agricultural production and land management, but for adapting in market economy (EMA 2003). The land units restituted were often too small and fragmented between numbers of heirs to provide sufficient production possibilities for a family (I).

Newly established farms and non-agricultural enterprises often lacked an established production routine, marketing channels, subsidies and capital for investments. They were also faced with problems such as outdated technology, delays in or not even receiving payments from the processing industry, a high increase in input prices and high inflation (Tamm 2001; EMA 2003, Sirendi 2009; I). The changes in the economic environment and problems faced by newly re-established farms resulted in a considerable drop in agricultural production, with most farms being unable to provide a sufficient livelihood for their families (I).

Estonia was characterised also by implementation of very liberal trade regime and lack of subsidies and lack of protection of local producers (I). Both agricultural producers and non-agricultural firms were left to

their own devices. The problems – losing foothold in eastern markets, with lack of skills and competitive products and investments to break into Western markets (Nikula 2004a), contributing to the collapse of former industrial complexes worsened the local economic climate further. A significant portion of the newly established agricultural and non-agricultural rural enterprises went out of business very shortly after they were established, and the majority of others barely survived while managing to provide only a meagre income for both employees and managers (Alanen et al 2001). In the years following the reforms, the Estonian agricultural sector shed jobs as overall agricultural production declined, most of the newly re-established private farms were unviable and they did not need nor could afford paid labour (I, II).

The agricultural reform only addressed the narrow scope of restitution and privatisation of assets, and not the wider issues of infrastructure and the provision of public service. In Soviet times, a significant portion of rural infrastructure was funded by agricultural production and a variety of services were provided by collective farms (Silberg 2001; Raagmaa 2002; Kalmi, 2003; EMA 2005, I, VI). While the organisation of essential public services was taken over by newly established local municipalities and state institutions, many services and the jobs of providing them disappeared altogether.

Due to EU accession in 2004, the overall economic climate in Estonia in the 2000s was characterised by economic growth until 2008 (Purju 2013). Access to the EU market increased trade in all sectors (I). While agriculture had adapted to the new conditions (I) and agricultural supports became available to agricultural producers with EU accession and application of the CAP, the majority of agricultural holdings re-established in the previous decade exited the sector (II II, Viira 2014).

The number of agricultural holdings³ increased until 2001 reaching 55.7 thousand and rapidly decreasing in the following years. By the end of

³ Until 2001, agricultural enterprises and private farms were used as statistical units for agricultural producers. From 2001, SE uses agricultural holdings as statistical units for agricultural producers. Agricultural holding – a single unit both technically and economically, which has single management and which produces agricultural products or maintains its land which is no longer used for production purposes in good agricultural and environmental condition, where there is at least one hectare of utilised

the 2000s, the decline in the number of agricultural holdings levelled. From 2001 to 2013, the number of holdings had decreased by 65% and by 2013 there were just 19.2 thousand agricultural holdings in Estonia. By 2016, the number of agricultural holdings was 16.7 thousand (SE 2017). Around 17.7 thousand persons were employed in crop and animal production, hunting and related service activities in comparison with 140.6 thousand in 1989 and 26.8 thousand in 2001 (III, SE 2015).

Agricultural production became concentrated in a small number of large holdings. In 2001, there were 1000 agricultural holdings (1.8%) with over 100 ha of land, which comprised 48.8% of all agricultural land. By 2013, their number had increased to 1794 holdings and they utilised 73.5% of all agricultural land (SE 2015). The majority of agricultural holdings that existed in the 2000s were small farms and older farmers (I, II), as the farmers who re-established private farms at the beginning of transition two decades earlier began to reach retirement age. For this reason, the availability of a successor to take over the farm was a critical factor. However, younger persons and persons with a higher level of education were more likely to have off-farm jobs, especially as working on the farm full time did not provide a sufficient livelihood for small farms. The off-farm employment, however, significantly increased the probability of farm exit (II).

Since the onset of the recession in 2008, Estonian agriculture has been characterised by crises and uncertainty, as the economic and political environments have been highly volatile (Viira 2014). The crises in recent years – including the outbreaks of African swine fever, Russian ban on EU food imports– will contribute to farm exits. However, at the same time, the number of rural enterprises, especially tertiary sector enterprises, has continued to increase steadily (SE 2006, IV, V, VI).

agricultural land, or there is less than one hectare of utilised agricultural land but agricultural products are produced mainly for sale (SE 2017).

5.2. Entrepreneurship and SMEs in rural municipalities, 2005–2012

5.2.1. Enterprises in Estonian rural municipalities, 2005–2012

With an increase in firm entries and legislative changes⁴, from 2005 to 2012 the number of enterprises in both rural and urban municipalities kept rapidly increasing. The total number of active enterprises in statistical profile⁵ climbed from 65.3 thousand to 108.8 thousand (SE 2015). The share of enterprises registered in rural municipalities has been relatively steady with rural enterprises accounting for 32% of all Estonian enterprises (Fig. 2).

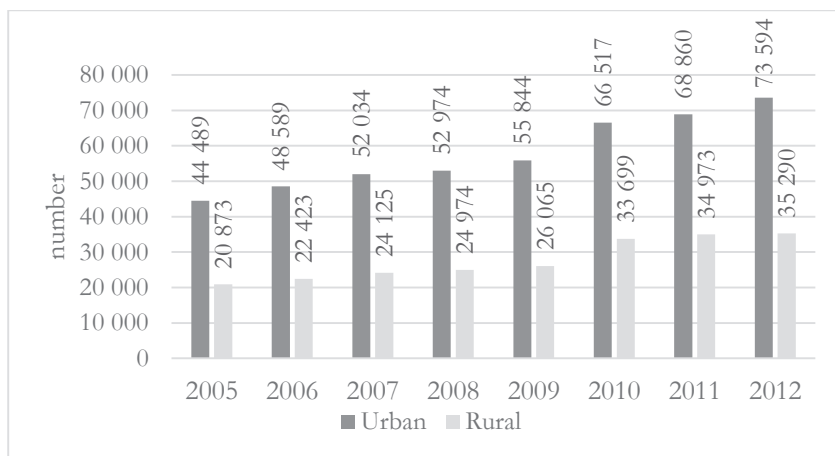


Figure 2. Enterprises in statistical profile, 2005–2012 (SE 2015)

⁴ From 2010, all economically active sole proprietors were required to register themselves in the Commercial Registry, as before 2009 sole proprietors who met certain criteria (e.g. turnover less than 250 000 EEK) did not have to be registered in the Commercial Registry – only in the Register of Taxable Persons – and therefore were not included in the statistical profile. Therefore, the increase in the number of enterprises in 2010 in comparison with 2009 is to a certain extent caused by changes in the registration requirements.

⁵ Database of economically active units (enterprises, institutions, non-profit associations) used by Statistics Estonia as a sampling frame for all economic statistics. Enterprises in statistical profile include companies and sole proprietors.

Papers III–V did not differentiate between rural municipalities located in urban hinterland and in the rural periphery as in Paper VI. However, if this approach is applied to statistics on registered enterprises, then in 2005 40% of all enterprises registered in rural municipalities and 13% of all Estonian enterprises were enterprises located in urban hinterland. By 2012 the share of enterprises in urban hinterland increased to 50% of all enterprises in rural municipalities and to 16.2% of all Estonian municipalities (SE 2015).

In the period studied, the share of large enterprises in Estonia was less than 0.2% (SE 2015); therefore, the focus is on SMEs in terms of the existing population of businesses in Estonia. The majority of Estonian enterprises are microenterprises and their share has been increasing – from 88.2% in 2006 to 93.6% in 2012 (SE 2015). The share of microenterprises in rural municipalities, especially in peripheral areas, is even higher. In 2010, 95% of enterprises in rural municipalities had fewer than 10 employees (IV). Even among those microenterprises the share of enterprises with more than a few employees is small. The survey on rural enterprises in 2012 showed that the median number of employees in Estonian rural enterprises was one as 38.5% of enterprises reported one full time employee and 23.7 had fewer than one full time employee. In the majority of cases, the entrepreneurs themselves are the only full or part-time employees (Institute of ... 2012).

Rural municipalities in Estonia are also characterised by a significantly higher number of sole proprietors – in 2010 45.8% of registered enterprises in rural municipalities were sole proprietors, while their share was 24% (IV) in urban areas. In peripheral municipalities, e.g. on the islands in Western Estonia (IV), South-Eastern Estonia (Institute of ... 2012), their share was over 60%. Western Estonia and Southern Estonia make up a disproportionately higher share of sole proprietors in Estonia. By 2012 over 40% of all sole proprietors were registered in those two regions, while less than a quarter of the Estonian population lives in those regions (SE 2015).

Changes in sectoral structures have been an important part of restructuring the rural economy. In the period studied in this thesis, the overall share of tertiary sector enterprises passed the share of primary sector enterprises in rural areas in Estonia for the first time (Institute of

... 2012). While the total number of primary sector enterprises has been relatively steady in recent years, the number of tertiary sector enterprises has doubled since the mid 2000s. By 2010, primary sector enterprises comprised a third of all enterprises registered in rural municipalities (IV). The entries of tertiary sector enterprises were mostly concentrated in rural municipalities in the urban hinterland. With this, differences in economic development patterns within rural areas continue to increase, because in rural periphery the overall entry rate was significantly lower (VI) and primary sector still continued to make up a half of existing businesses in peripheral regions (III, IV).

5.2.2. Enterprises and local development in Western and South-Eastern Estonian municipalities

The analyses in papers III and IV studied economic and demographic developments within specific regions in Estonia. In papers III and IV cluster analysis was used to create a typology of different municipalities within regions. The number of enterprises per 1000 inhabitants (III, IV), share of primary sector enterprises (III, IV), enterprise birth and death rates (III), share of sole proprietors (IV) were used to characterise the existing stock of enterprises within the regions.

As the number of exits has been lower than entries and with the increase in entries, the overall number of enterprises per 1000 inhabitants in Estonia increased rapidly – from 52.8 enterprises in 2006 to 74.8 enterprises in 2010 (IV). The indicator increased in all types of municipalities. While the indicator remained higher in urban areas than in rural municipalities in Estonia overall, there were significant differences within regions (III, IV).

The high economic inactivity of the population continues to be a considerable problem in the rural municipalities of South-Eastern Estonia. Even before the onset of the recession, less than half of the working-age population in the rural municipalities of the region was employed (III). In terms of local incomes and consumer market, this region provides an unfavourable environment for entrepreneurship.

Like South-Eastern Estonia, Western Estonia has been characterised by a steady population decline. The Western Estonian islands particularly differ from the mainland counties, as the number of enterprises per population was not only higher in rural municipalities, but also higher than the Estonian average and higher than in South-Eastern Estonia (III). The two counties on the islands have lower than average population density even among Estonian rural municipalities and in comparison with South-Eastern Estonia. This can explain why the share of sole proprietors and microenterprises are also among the highest in Estonia (IV). On the one hand, isolation from the mainland drives necessity-based entrepreneurship, as employment opportunities are limited. On the other hand, the location on the islands would also mean less competition from enterprises from the mainland, thereby creating business opportunities for the provision of services and products for the local population.

The cluster analysis provided a more detailed view of diverse development patterns within rural areas. One distinctive type of municipality in both papers was a group of local municipalities with a bigger population than the regional average. Most of them were part of the urban hinterland of local centres (III, IV). This type was characterised by more favourable demographic developments, the lower share of primary sector enterprises, but also smaller number existing of enterprises per 1,000 inhabitants, because the number of sole proprietors is considerably smaller. One explanation is the higher share of secondary sector enterprises as those are significantly larger than other rural enterprises in terms of the number of employees (Institute of ... 2012). Another explanation is that those municipalities are bedroom communities for the local centres. The proximity of local urban centres provides favourable employment opportunities, thereby reducing the need for self-employment. In South-Eastern Estonia especially, those municipalities also had a lower start-up rate in comparison with rural municipalities in the hinterland of the Estonian capital and the second largest town Tartu analysed in Paper VI. The agglomeration effects around the smaller urban centres seem to be relatively limited, as entrepreneurial activity was higher than the Estonian average in the case of rural municipalities around Tartu and Tallinn (VI).

The municipalities with the highest primary sector share usually have the lowest level of incomes(IV). As the wages in agriculture in Estonia have been consistently among the lowest of all economic activities in the past 20 years, it can be expected that the high share in the primary sector equates to low local incomes. In Western Estonia, this group of municipalities is particularly apparent due to it having the lowest incomes and highest share of sole proprietors, although the number of enterprises per 1000 inhabitants is higher than the national average (IV).

The number of enterprises per 1000 inhabitants was highest in the clusters formed by the smallest municipalities in Western and South-Eastern Estonia (III, IV). In Western Estonia, this type was characterised by a higher share of tertiary and secondary enterprises as well as level of incomes, indicating the importance of diversification in the rural economy (IV).

5.2.3. Financial performance of rural enterprises

Paper V discussed some of the results on the financial performance of rural enterprises obtained in the survey on Estonian rural enterprises in 2012 (Institute of Economics ... 2012). The analysis focused solely on companies and the period of 2005–2010. Companies registered in rural areas accounted for 22.5% of economically active companies in 2005. The annual growth in the number of active companies was more rapid in rural areas. From 2005 to 2010, their number increased by 76% (in urban areas the increase was 27%). By 2010, the share of rural companies in the total number of companies had increased to 28.7% (V).

Some of the previous analyses (Institute of ... 2012; Põder et al 2013) that used the same survey data as Paper VI indicated statistically significant differences in the financial performance of urban and rural enterprises. The mean return on assets, value added and labour efficiency was significantly lower in rural companies (Institute of ... 2012). The same trend was also evident in investments into fixed assets and sales revenue that were studied in Paper V.

The years of 2005–2007 were characterised by a rapid increase in both investments and sales revenues. SE (2013) assessed that the annual investments of Estonian companies increased from 2.73 billion in 2005 to 4.29 billion euros in 2007 – a 57.1% increase fuelled by the easy availability of credit and economic growth. From 2008, the volume of investments started to decline and, despite the first signs of economic recovery in 2010, annual investments in fixed assets in economically active enterprises in 2010 were still significantly below the level of the economic boom years following EU accession (V). The decline in the total sales revenue of economically active companies was not so sharp. Sales revenues recovered from the recession more quickly than investments. The sales revenue of companies had increased from 31.4 billion to 44.5 billion by 2007, followed by a decline in 2008 and 2009, but increasing to 37.9 billion in 2010 (V).

The comparison of mean investments per active company (Fig. 3) showed that investments in urban enterprises grew at a more rapid pace during the years of economic growth.

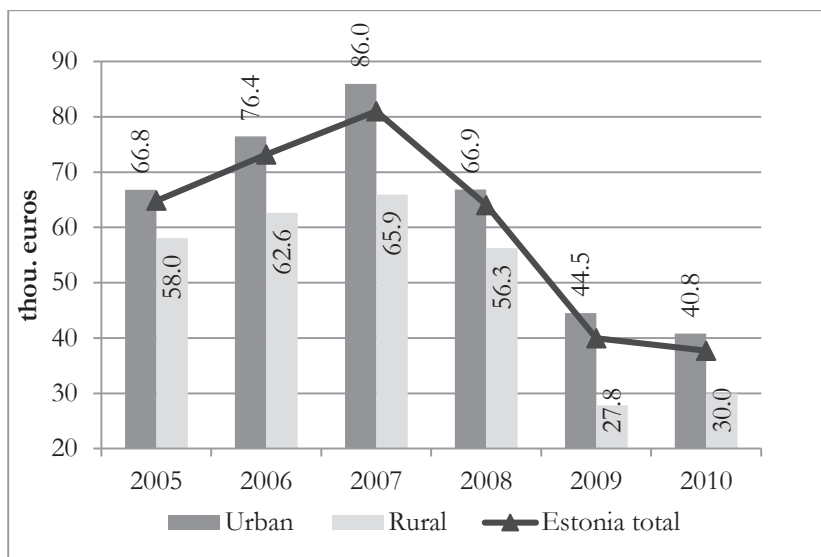


Figure 3. Mean investment per economically active company, 2005–2010 (V)

While the mean investment made by a rural enterprise was around 13% lower in 2005 than in an urban enterprise, the difference was around 24% (V). Investments in rural enterprises declined more rapidly with the onset of the recession. In comparison with the peak in 2007, annual investment in rural companies was around 58% lower in 2009, while in urban enterprises the difference was around 48%. However, in 2010, the average investment per rural enterprise started to increase, while the indicator continued to decline for urban enterprises. However, the mean investment per company in rural areas was still 26.5% lower than the mean investment per urban company (V).

The sales revenue per company also increased at a more rapid pace in urban companies during the economic growth years, while it decreased less during the years of the economic recession. In 2005, the mean revenue per rural company was lower than the mean of urban companies by around 36%; in 2010, the difference in mean was around 45% (V). The comparison on annual revenues per companies in 2005 and 2010, In 2010 the mean sales revenue per urban enterprise was 92% of the 2005 level while the indicator was 80% of the level of 2005 (V).

5.2.4. Firm entries and exits in local municipalities

Armington and Acs (2002) explain that the labour market approach to start-up rate has particular theoretical appeal, as job creation is one of the focal points of entrepreneurship policy. The entry rate can be conceptualised as the propensity of a member of the work force to establish his/her own enterprise (Fritsch 2008). The following sections discuss the results obtained in Paper VI with labour market approach to start-up rate.

In the period studied, new firm births exceeded the number of firm deaths. The mean entry rate for all types of municipalities was 4.59, while the exit rate for the period was 2.74 firm deaths per labour aged population(VI). In comparison with some other countries, such as the US in the middle of the 1990s (annual rate 3.85 entries; Armington, Acs 2002), the mean firm formation rate was somewhat higher, but it was generally lower than in Germany in 1983–1992 (Brixy , Grotz 2007),

Netherlands in 2004–2009 (Delfmann *et al.* 2014) or Finland in 1989–1993 (Kangasharju 2000).

The entry rate temporarily decreased during the recession years, while the exit rate increased (VI). The overall trend of the increase in both firm entries and exits has continued in the economic recovery years following the recession, as the annual number of new firm births and firm deaths has doubled in the decade since EU accession.

In the period studied, half of enterprise entries and exits occurred in the Estonian capital of Tallinn (SE 2015). The rural municipalities around Tallinn in Northern Estonia also display the highest entry rates as well as high level of exits (Fig. 4; Fig. 5). In other parts of Estonia, the rural municipalities clustered around the second largest town of Tartu in Southern Estonia and Pärnu in Western Estonia are characterised by a higher level of entries and exits (VI).

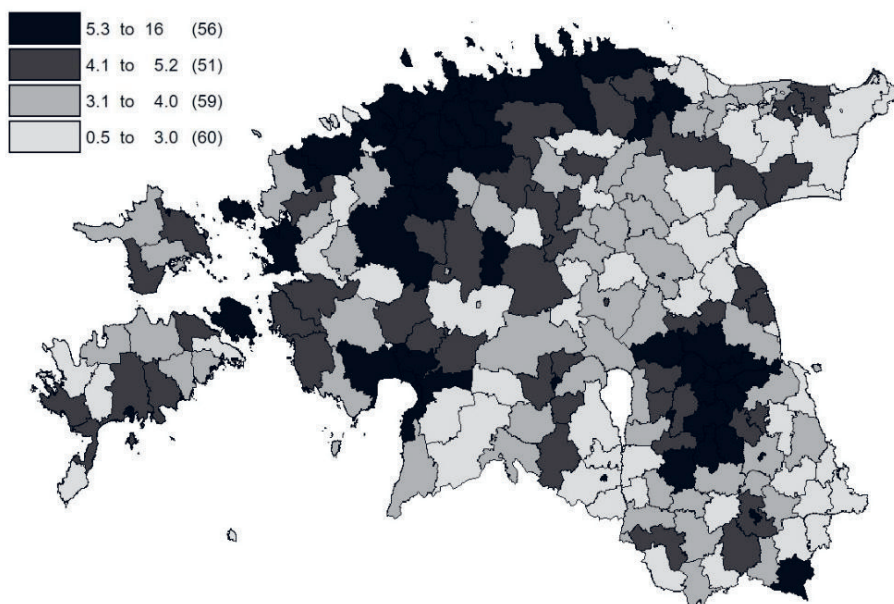


Figure 4. Mean firm entry rates in Estonian municipalities in 2005–2012 (labour market approach; VI)

The variation in entry and exit rates between individual municipalities has been significant. The highest mean entry rate for the period of 2005–2012 was 16 entries per persons in labour force in a municipality that is part of the hinterland of the capital, while the lowest rate was just 0.53 entries. In terms of exits, the difference was somewhat less with 9.98 exits in the municipality with the highest exit rate versus just 0.48 exits in the municipality with the lowest exit rate (VI).

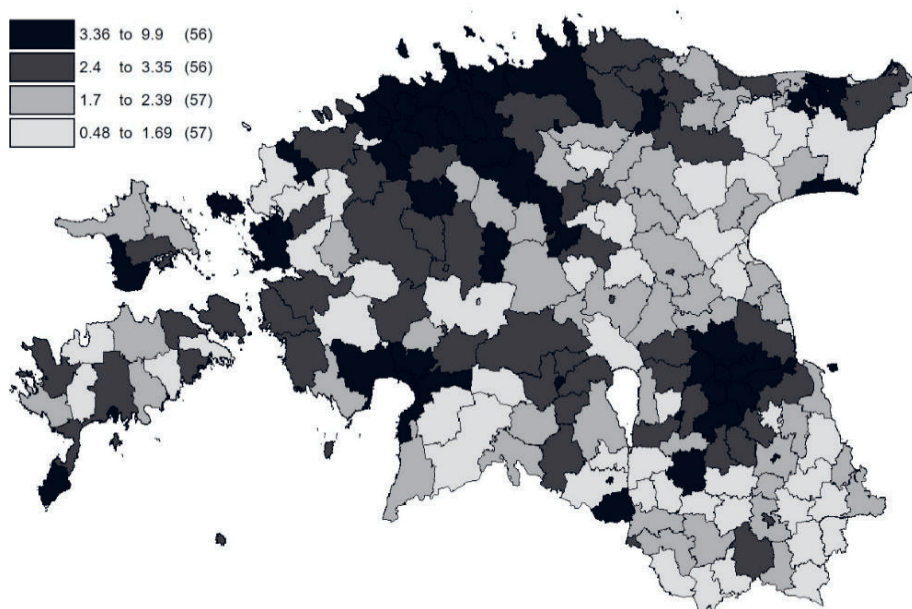


Figure 5. Mean firm exit rates in Estonian municipalities in 2005–2012 (labour market approach; VI)

The entry rates were highest in rural municipalities in the urban hinterland with a mean rate of 6.8 firm births for the period of 2005–2012, while it was 5.0 new entries in urban municipalities and just 3.8 in the rural periphery (Table 3). The entries slightly decreased in urban areas and the urban hinterland during the recession, though they continued to rapidly increase in 2011–2012, reaching the rates of 7.7 and 5.7 firm births per labour age in the urban hinterland and urban municipalities. Exit rates, however, continued to be high, indicating high economic volatility (VI).

Table 3. Statistically significant differences between municipality types (VI)

Variable	Mean			Kruskal-Wallis test
	Urban municipalities (N=33)	Urban hinterland (N=48)	Rural periphery (N=145)	Sig.
Entry rate 2005–2012	5.0	6.8	3.8	***
Entry rate 2005–2007	4.9	6.6	3.3	***
Entry rate 2008–2010	4.7	6.4	3.5	***
Entry rate 2011–2012	5.7	7.7	4.8	***
Exit rate 2005–2012	3.4	3.9	2.2	***
Exit rate 2005–2007	2.3	2.4	1.4	***
Exit rate 2008–2010	4.2	4.8	2.6	***
Exit rate 2011–2012	3.9	4.7	2.7	***
Population density	947.7	33.4	20.0	***
Income	653	713	631	***
Unemployment	5.1	4.0	4.5	**

* $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$

Rural periphery was the only type in which the entry rates did not drop during the recession. While the relative increase in the number of enterprise births from 2005 to 2012 was highest in the rural periphery, the average entry rate in 2011–2012 was still below the level of entries urban municipalities and urban hinterland displayed in 2005–2007 (VI).

5.2.5. The impact of socio-economic determinants on firm entries and exits in rural areas

Panel data analysis in Paper VI studied whether the impact of socio-economic developments would have different effects on more centrally located rural areas versus peripheral or urban areas. The results of fixed effect regression models (Tables 4 & 5) showed that income level and the economic recession had the largest impact on entry and exit rates in different types of municipalities. While the firm entry and exit rates in municipality types were significantly different, the comparison of the six panel data models indicated that where the local development indicator

had a significant impact on entrepreneurship, the factor had the same kind of impact in urban and rural municipalities (VI). For example, an increase in incomes had a significant positive impact on firm entries in all types of municipalities. Incomes were significant in the exit models of the urban hinterland and rural periphery and they had the same type of effect in both models. The economic recession increased exits across all municipality types. In entry rates, it had the same kind of negative impact in models in which it was statistically significant (VI).

Table 4. Estimates of fixed effect models with entry rate as dependent variable: within estimation

	Model 1	Model 2	Model 3
	Urban municipalities	Urban hinterland	Rural periphery
Independent variables	Coefficient	Coefficient	Coefficient
<i>Population density</i>	-0.001 (1.65)	-0.012 (-0.64)	0.015 (0.96)
<i>Income</i>	0.003 (1.99)*	0.007 (4.39)***	0.004 (2.98)**
<i>Unemployment</i>	0.003 (0.08)	0.060 (1.03)	0.052 (1.34)
<i>Time_2008_2010</i>	-0.902 (-2.01)*	-1.815 (-3.61)***	-0.623 (-1.80)
<i>Time_2011_2012</i>	0.015 (-0.03)	-0.741 (-1.36)	0.543 (1.35)
F-statistic	5.11***	10.21***	17.79***
Adjusted R ²	0.08	0.11	0.07

* $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$; *t-values in parentheses*

Table 5. Estimates of fixed effect models with exit rate as dependent variable: within estimation

	Model 4	Model 5	Model 6
	Urban municipalities	Urban hinterland	Rural periphery
Independent variables	Coefficient	Coefficient	Coefficient
<i>Population density</i>	0.002 (1.13)	0.045 (3.18)**	0.014 (1.09)
<i>Income</i>	0.002 (1.85)	0.006 (4.87)***	0.003 (2.58)**
<i>Unemployment</i>	0.010 (0.34)	-0.011 (-0.25)	0.015 (0.50)
<i>Time_2008_2010</i>	1.494 (4.33)***	1.163 (3.05)**	0.645 (2.32)*
<i>Time_2011_2012</i>	1.290 (3.39)**	0.637 (1.54)	0.658 (2.04)*
F-statistic	34.0***	56.77***	23.10***
Adjusted R ²	0.36	0.40	0.09

* $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$; *t-values in parentheses*

Municipalities in the urban hinterland have been performing better in terms of higher levels of incomes and in unemployment and population change. In 2005–2012, 82.3% of Estonian municipalities experienced a population decrease (SE 2015). While urban centres, especially smaller towns, and the rural periphery are characterised by a high level of population loss, the urban hinterland, especially municipalities around the capital, saw a significant increase in population density. However, the panel data analysis in Paper VI shows that the population change did not have a significant impact on new firm births. The change in unemployment levels did not have an impact on entrepreneurship in the regression models in Paper VI.

6. DISCUSSION

6.1. The impact of transition and agricultural restructuring on rural economy

The institutional reforms and structural changes in agriculture have had considerable economic and social consequences for rural areas and on the environment the rural areas provide for entrepreneurship. Baumol (1990) points out that the “rules of the game” usually change very slowly. However, in CEECs transitioning from a planned economy to a market economy the institutional reforms fundamentally changed the property relations as well as the economic and political systems in a relatively short period of time (Welter, Smallbone 2011). Within a few years of the beginning of the transition period, the institutional and socio-economic environment for rural entrepreneurship was transformed with rapid changes in formal institutions. These created the first legal opportunities for private farming and entrepreneurship followed by the regaining of independence, together with property, land and agricultural reforms resulting in the collapse of previous agricultural and economic structures and the creation of new ones (I, II, VI). In one sense, this created plenty of new opportunities for entrepreneurship. Privatisation, restitution, opening of the economy and new market niches, demand for new consumer goods after the shortages of the Soviet period and informal institutions – values, traditions, public opinion – drove the establishment of new enterprises. On the other hand, uncertain economic and institutional relations, economic decline, and entrepreneurs’ lack of skills and capital created a challenging environment and resulted in a wave of bankruptcies of both newly established agricultural and non-agricultural enterprises (Alanen *et al.* 2001).

One of the biggest challenges connected with agricultural restructuring during the transition and the farm exits in the 2000s was the disappearance of rural jobs and lack of non-agricultural jobs to replace them. As the transition produced considerable rural poverty and greater inequality in income distribution (Alanen 2004; Buchenrieder, Möllers 2011), the rural population has lost significantly in the transition (Buchenrieder *et al.* 2009). In Estonia, agriculture saw one of the biggest drops in employment in the 1990ies and agricultural incomes became

one of the lowest, resulting in a considerable drop in rural income levels (EMA 2003). Several authors (Alanen *et al.* 2001, Nikula 2004b) have pointed out that this also had catastrophic effects on the new established non-agricultural rural enterprises, since the majority of them relied on local consumer demand (Alanen *et al.* 2001). The Estonian Ministry of Agriculture (EMA 2008) estimated that the rural jobs created by the tertiary and secondary sectors compensated for less than one third of the jobs that disappeared in the primary sector in rural areas in the 1990s. The overall situation in the rural economy was also made worse by the newly privatised non-agricultural rural enterprises, which also struggled and shed jobs. In most cases, privatised enterprises reduced their labour considerably in contrast to the previous socialist system in which decisions on labour needs were often not made concerning efficiency and profitability. Several authors, including Nikula (2004b), have painted a bleak picture of rural entrepreneurship in the Baltic states during the transition — often based on the spin-offs of former collective farms with underdeveloped infrastructure and outdated technology, operating in unstable markets, desperately short of the required labour and solvent customers, and providing only meagre incomes.

While the transition caused specific problems for the CEEC economies as a whole, the difficulties of major structural adjustment in agriculture and their consequences lasted often much longer and continued to be difficult to overcome (EMA 2003). The importance of agriculture in the rural economy has been decreasing in Estonia, but agriculture was the prevailing activity of rural enterprises in the 1990s as agricultural enterprises dominated among the overall number of enterprises registered in rural municipalities until the middle of the 2000s. Agriculture is still the main activity of enterprises in Estonian municipalities in peripheral regions (III, IV). While the majority of Estonian farms re-established in the 1990s were unviable and exited the agricultural sector in the 2000s, the concentration of agricultural production to a small number of large holdings and the exits of smaller ones has continued, although at a slower pace, into the present decade. While those developments have increased the demand for non-agricultural rural entrepreneurship and the new jobs it would provide, they have not created a particularly favourable environment for entrepreneurship in rural areas where the local population, previous

sources of income and demand for products and services decreased along with the disappearance of agricultural jobs, services and enterprises resulting in lagging social and economic development (VI).

6.2. Rural entrepreneurship and the impact of socio-economic developments, 2005–2012

Estonia follows a similar pattern to many other countries, e.g. other Baltic countries (Sauka, Welter 2014), Western Europe (Mason 1991), where entrepreneurship continues to be concentrated in large agglomerations, often including the area around the capital city. In Estonia, new firm entries in rural municipalities are concentrated into areas around capital Tallinn and a few larger towns. Entrepreneurship development has been relatively limited in central Estonia, the area along the southern border and the north-eastern corner. Central Estonia is one of the most favourable areas for agriculture in Estonia; agriculture has retained its relative importance in the rural economy there and this may explain the low number of entries. Research in Western Europe (including Mason 1991) has provided many examples of how former industrial regions are struggling with attracting entrepreneurship. This is also the case with the industrial region of North-Eastern Estonia, which has continued to struggle with economic restructuring in recent decades and has very low entry rates, while some municipalities in the area also saw a large number of exits during the recession.

As Smallbone (2009) points out that as rural areas are heterogeneous, rural areas are not always disadvantaged in urban-rural comparisons, especially as centrally located or more accessible rural areas often perform very well. This is also demonstrated by the analysis in Paper VI. In terms of municipality type (urban, urban hinterland, rural periphery), there was a significant difference in entry and exit rates as well as socio-economic developments. The more centrally located rural municipalities in the hinterlands of larger urban centres are characterised by higher enterprise entries, population increase and lower unemployment than their urban centres or rural periphery (VI). While the urban hinterland in Estonia provides an environment that captures

more positive agglomeration, enterprises in the hinterland are also affected by negative agglomeration effects. The development of infrastructure has been especially lagging behind population and enterprise relocation to those areas (Institute of ... 2012). Also, higher competition, higher labour costs and opportunity costs for entrepreneurship are factors that contribute to a higher level of enterprise exits in the urban hinterland.

The local income levels and macroeconomic climate were the most significant factors to affect entrepreneurship in the present analysis. However, the impact was similar in the different types of municipalities studied (VI). The increase in incomes was connected with higher level of entries and exits, while the recession increased exits and decreased entries. The same type of impact in both rural and urban areas can support the argument for viewing “entrepreneurship in rural areas” not as something distinctive because of its rural character, but as entrepreneurship taking place in rural locations. Another explanation that should be considered is that in the case of Estonia the differences between urban and rural are not that pronounced, e.g. in comparison with many Western countries, so that changes in population or income levels, among other factors, would have different effects within urban and rural contexts.

Local labour and consumer market affects the size and growth prospects of rural enterprises. In Estonian municipalities, both entries and exits are concentrated in areas with increasing income levels. High income levels signal an affluent economy (Reynolds *et al.* 1994, Verheul *et al.* 2001). Rising local income levels increase the local demand for new products and services as well as the availability of capital for establishing a firm. However, this indicates higher opportunity costs for entrepreneurship, competition and labour costs. The majority of newly born firms in Estonia are also tertiary sector enterprises, with tertiary sector enterprises having outnumbered primary sector enterprises in rural areas by 2006 (V). The newly established enterprises providing services are especially dependent on either local consumer incomes or on attracting outsiders with their services. The entries of those tertiary rural enterprises are concentrated in urban hinterlands or coastal municipalities (V, VI, Institute of ...2012).

The structural change in agriculture should bring forth both the demand for and supply of non-agricultural rural entrepreneurship. Persons who were previously working in agriculture require jobs in non-agricultural enterprises, but they are also a source of new entrepreneurs, who are either compelled or willing to get involved in non-agricultural entrepreneurship. However, as the firm birth rates in municipalities in the rural periphery are still significantly lower and despite the farm exits, in most peripheral municipalities primary sector enterprises still dominate despite the fact that most of the new entries are tertiary sector enterprises (V, VI). Therefore, while the economic restructuring of the rural economy will diminish the role of agriculture, the gap in the development patterns of peripheral and centrally located areas will continue to increase as peripheral areas struggle to find economic activities to replace agriculture.

Local income levels were also the significant factor for entries in the rural periphery. However, the incomes in those municipalities have been consistently lower than the Estonian average since the transition period, which explains the lower entry rate. The lag in incomes means poor local demand and difficulties in acquiring capital for entrepreneurship (I).

One of the institutional factors that has contributed to the continuing annual increase of firm births has been the change in the Estonian Commercial Code, which in 2011 eased the minimal share capital requirement of 2500 euros for establishing a private limited company. This is only one institutional measure, however, as over half of newly created private limited companies – the most common legal form of business in Estonia – have been since established without the payment of share capital. Therefore, it can be assumed that this change in policy has had a considerable impact (VI). From 2005 to 2012, both firm entries and exits steadily increased, particularly in the volatile economic recovery years of 2011–2012. The relative increase in the mean annual entry rate and the number of enterprises per inhabitants was highest in rural periphery municipalities in comparison with the previous period, especially in 2011–2012. Therefore, it is possible that the rural periphery benefitted most from the legislative change in 2011. As the level of incomes, and thus ability to raise capital, has been consistently lower in

the rural periphery, the easing of capital requirements for private limited companies would remove a significant barrier for entry.

The panel data analysis in Paper VI reached a result similar to that of Kangasharju (2000), wherein the population change did not have a significant impact on new firm births. In the period studied, the population decreased in the majority of Estonian rural municipalities, with the exception of rural municipalities in the urban hinterland, while firm entries increased. Some of the very small peripheral municipalities, especially along the coast, that saw a considerable decrease in the population have a relatively high number of entries (VI). The higher level of entries may be the result of both opportunity driven and necessity driven entrepreneurship seeking to harness the unique features of local areas (e.g. coastal areas for tourism) as well as the attractive living environment. This is in line with some of the results of research by Delfmann *et al.* (2014) in the Netherlands, which showed that population decline in rural areas is not necessarily a negative for new firm formation.

Previous research on the effects of unemployment on entrepreneurship has shown ambiguous results with examples of positive as well negative impacts or no impact at all. With the onset of the recession in Estonia, the unemployment rate grew rapidly and remained relatively high. However, one of the limitations in the analysis is that the unemployment rate is compared with the entrepreneurship data from the same year. It is possible that if a time lag were to be included, unemployment may have an effect on entrepreneurship, as those newly unemployed do not necessarily try to become self-employed right away. Instead, they may look for other options as well as needing time to discover entrepreneurial opportunities and require the resources for entrepreneurship. Audretsch and Fritsch (1994) also suggest that different results on the impact of unemployment on entries may be affected by which approach was used for calculating entry rate.

Several authors (Audretsch, Fritsch 1994; Armington, Acs 2002) emphasise that ecological and labour market approaches to calculating the start-up rate can provide very different results. For example, if the size of enterprises in a region is high, but their numbers are low, the ecological approach would result in a relative higher birth rate, while the

labour market approach for the same region can result in a lower than average birth rate. This was also a case in rural municipalities in South-Eastern Estonia, as analysed in Paper III. With a very small number of existing enterprises, new entries produced a higher than Estonian average start-up rate in rural municipalities according to the ecological approach. However, with the labour market approach used in Paper VI, the entry rates in the region were lower than average. With the ecological approach, the annual birth rate was higher at the beginning of the period studied, because the number of existing enterprises used as a denominator was smaller. With an increase in the existing business stock, the relative share of newly born firms in the total number of enterprises was lower in the following years.

Previous studies have suggested that rural areas can have higher business survival rates (Smallbone *et al.* 1999; Smallbone *et al.* 2003; Yu *et al.* 2011). This was also suggested by lower than average exits in the rural periphery in Estonia (VI). However, as the number of entries was also significantly lower, entrepreneurship in the rural periphery has stabilised to a low level of entrepreneurial activity.

Rural companies' lower sales revenue and ability to invest poses a serious problem. During the recession, the average annual investments and sales revenues in rural companies declined more rapidly. While the drop in annual sales revenues started to recover with increased domestic demand, and due to the high inflation in the years following the recession, the overall volume of investments made by companies following the recession years have still remained below the level of 2007 (V, SE 2015).

As the share of urban hinterlands in rural population and rural entrepreneurship continues to increase, most of the Estonian rural population will be located in accessible areas and the most common rural business will be a tertiary enterprise located in the urban hinterland that provides the most favourable environment for firm entries. The increase of the tertiary sector in the rural economy will create a new set of challenges. A minimum level of goods and services will also be required in peripheral and depopulating areas (Delfmann *et al.* 2014). However, the experience during transition showed that many local tertiary sector enterprises failed because they could not sustain their

business against the backdrop of local and falling demand. Rural enterprises have to orient their services to non-local markets in order to survive. During the recession, however, microenterprises in the tertiary sector were impacted hardest (Institute of ..., Pöder et al ... 2013) as consumers cut down on the consumption of discretionary services first. Therefore, with the increase in tertiary rural enterprises, they became more exposed to global economic downturns.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Conclusions

The analysis confirmed four hypotheses out of five.

1. Institutional changes, including legalisation for private entrepreneurship and farming, opened up new entrepreneurship opportunities that were actively pursued, resulting in rapid growth in the number of agricultural holdings and non-agricultural enterprises in the 1990s. Institutional restructuring, the collapse of previous economic relations, the economic and agricultural decline that accompanied the transition, the *laissez-faire* policy approach adopted by Estonian government created a highly volatile and rapidly changing environment to which enterprises in rural areas had trouble in adapting. While agricultural production and employment decreased and farm exits increased, most rural municipalities lacked non-agricultural enterprises and jobs to compensate for the decline (I, IV, VI). Therefore, the agricultural decline accompanied by the deterioration in local demand and incomes in rural areas also created an unfavourable environment for non-agricultural rural enterprises.
2. Since the 2000s, entrepreneurship development patterns within rural areas have continued to become more diverse. The more centrally located rural municipalities in the hinterlands of larger urban centres are characterised by significantly higher enterprise entry and exit rates than urban centres or rural municipalities in the periphery (VI). With the continuing concentration of rural enterprises in the urban hinterland, the share of those enterprises has increased to become half of all enterprises registered in rural municipalities. Regionally, however, the entries and exits are mostly concentrated in the rural municipalities around the hinterland of the Estonian capital of Tallinn in Northern Estonia, the second largest town of Tartu in Southern Estonia, and to Western Estonia to a certain extent; at the same time, entrepreneurship development in the rural

areas of the north-eastern, central and south-eastern parts of Estonia has been relatively limited (III, IV, VI).

3. In the present research, it was hypothesised that local socio-economic and demographic developments would have a different impact in different types of municipalities. This was not confirmed, because while the changes in local incomes and onset of the economic recession were the determinants that had a significant impact on firm entries and exits in the panel data models, the direction of the impact was the same in the municipalities in the urban hinterland, periphery and in urban centres. The increase in incomes was connected with a higher level of entries and exits. Changes in unemployment and population density did not have a significant impact on entries and exits.
4. The economic recession had a different impact on enterprises entries and exits. The enterprise entries decreased in both urban areas and the urban hinterland in the years of 2008–2010. The rural periphery was the only type in which the entry rates did not decrease during the recession; however, the indicators remained still below the level of those in urban municipalities and the urban hinterland (VI). The recession years and the volatile macroeconomic years of 2011–2012 resulted in a significant increase in enterprise exits in all types of municipalities in comparison with the economic growth years of 2005–2007 (VI).
5. As the average investment and sales revenue per company grew more rapidly in urban companies in economic growth years and decreased more rapidly in rural companies in the economic recession years, the gap between urban and rural companies continued to increase with rural companies characterised by significantly lower average investments and sales revenues (V).

7.2. Research and policy recommendations

As the current trends of relocation of the rural population and economic activities to more centrally located rural municipalities continue, this also signals the need for a more complex approach to the classification of rural areas. This also requires attention in the context of the currently ongoing administrative-territorial reform in Estonia by

which demographically and economically very different municipalities will be merged. The policy responses have to take into account that the needs of peripheral and centrally located rural areas continue to become more diverse and complex. The accessible areas with quick population growth and real estate developments increase in tertiary and secondary enterprises and are exposed to different pressures than peripheral areas, where agriculture is still the main economic activity.

The measure that allows establishment of private limited companies without the share capital went into effect in 2011 in order to alleviate the capital constraints of potential entrepreneurs and to decrease the barriers for entrepreneurship. Since then, over half of new enterprises have been established without the payment of minimal share capital. The data available for the present analysis are not sufficient for a detailed study on the private limited companies established without the minimal share capital. How those enterprises develop in the long term requires attention in order to assess what the outcomes of this policy have been. As the number of entries has increased rapidly, this measure has fulfilled the purpose of facilitating new entries. However, the goal of entrepreneurship policy should not only be the maximisation of new registrations; it should be growth and new jobs in those enterprises, and it can be hard to achieve these without acquiring sufficient resources. The simple creation of companies without sufficient capital is a potential source of unproductive entrepreneurship for society. For this reason, this policy measure might not lead to the results the policy makers have been hoping for; therefore, it is vital to study the performance of those companies and risks in more detail and over a longer term.

Paper V used the simple dichotomy of rural/urban for the comparison of financial indicators of companies, and analysis was for a relatively short period of time and for just a few indicators. The topic of regional/geographical space should be investigated further by including more indicators, expanding the period of analysis and going into more detail about the size, location and economic activities of the companies. This would provide an insight on how the volatile years following the recession affected different types of companies in different regions. This data would be a valuable source of information for potential

entrepreneurs, investors as well as for policy makers trying to address the bottlenecks for SME development in rural areas.

Previous research in other countries (Vaessen, Keeble 1995; Smallbone *et al.* 1999; Bryden, Munro 2000, Siemens 2010) has demonstrated different strategies used by rural enterprises in peripheral locations to adapt to their local socio-economic environment. This should also be explored with firm-level studies in an Estonian context. Research on successful businesses and their survival strategies provide role models for other entrepreneurs and provide data for local governments on what kind of local resources could be utilised for entrepreneurship in disadvantaged locations.

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SUMMARY IN ESTONIAN

ETTEVÕTLUST MÕJUTAVAD SOTSIAAL- MAJANDUSLIKUD TEGURID EESTI VALDADES

Sissejuhatus

Olles uute ettevõtete, töökohtade, majanduskasvu ja innovatsiooni allikas, aitab ettevõtlus kaasa tehnoloogilistele, sotsiaalsetele, struktuursetele ja organisatsioonilistele muutustele ning majanduse uuendamisele (Fayolle 2007). Ettevõtlusel on tähtis osa piirkondade kohanemisel majanduslike muutustega (Commission of ... 2003, Barreneche-Garcia 2014). See teema on eriti aktuaalne Eestis, kus on jätkuvaks probleemiks plaanimajanduselt turumajandusele üleminekul kiiresti suurenenud regionaalsed arenguerisused ning majandustegevuse ja rahvastiku koondumine paari linnapiirkonda.

Ettevõtlusalastes teadusuuringutes domineerib ettevõtja isiksuse keskne lähenemine, kus põhitähelepanu on suunatud ettevõtja isiksuse omadustele ja soovile ettevõtjaks saada (Backmann, Karlsson 2013). Ettevõtluskeskkonna tegurite mõju on uuringutes saanud seni tunduvalt vähem tähelepanu. Ettevõtlus ei arene vaakumis (Shane 2003). Ettevõtlusvõimalused on igal ajahetkel erinevates piirkondades erinevad (Karlsson, Gråsjö 2013). Ettevõtte loomist ja arengut mõjutavad institutsionaalsed, majanduslikud, tehnoloogilised, regionaalsed jm tegurid.

Käesolev doktoritöö uurib sotsiaal-majanduslike tegurite mõju ettevõtlusele Eesti valdades. Sotsiaal-majanduslike tegurite all on mõeldud ettevõtteväliseid majanduslikke, sotsiaalseid, institutsionaalseid ja regionaalseid tegureid. Doktoritöö ei käsitle looduskeskkonna tegurite mõju.

Doktoritöö aluseks on kuus artiklit, mis käsitlevad ettevõtluse ja seda mõjutava sotsiaal-majandusliku keskkonna erinevaid aspekte Eesti maapiirkondades. Artiklites käsitletud sotsiaal-majanduslikud tegurid on institutsionaalsed ja struktuursed muutused põllumajanduses alates üleminekuperioodist – piirkond, makromajanduslik keskkond, kohalike elanike sissetulekud, töötus, ettevõtete sektoriaalne struktuur, füüsilisest

isikust ettevõtjate (FIE) osakaal, rahvastiku muutused aastatel 2005–2012.

Püstitatud uurimishüpooteesid on järgmised.

1. Taasiseseisvumise järgsed muutused Eesti põllumajanduses ja paljude põllumajandustootjate tegevuse lõpetamine 2000. aastatel tekitasid maapiirkondades ettevõtluse jaoks suhteliselt ebasoodsa keskkonna, mis mõjutas maamajandust pikka aega (I, II).
2. Ettevõtluse areng on erinevat tüüpi kohalikes omavalitsustes (keskuste tagamaadel, ääremaalistes valdades, erinevates piirkondades) väga erinev (III, IV, V, VI).
3. Euroopa Liiduga liitumise järgsel perioodil oli Eestis erinevat tüüpi valdades kohalikel sotsiaal-majanduslikel ja demograafilistel teguritel ettevõtlusele erinev mõju (III, IV, VI).
4. Valdades oli majanduskasvul ja majanduslangusel ettevõtete asutamisele ning likvideerimisele erinev mõju (III, VI).
5. Majanduslangusel oli suurem mõju maapiirkonna väike- ja keskmise suurusega ettevõtete finantstulemustele kui linnaettevõtete finantstulemustele (V).

Kirjanduse ülevaade

Ettevõtlus on mitmetahuline kontseptsioon, millele erinevad teadusharud lähenevad väga erinevatest empiirilistest ja teoreetilistest vaatenurkadest (Low, McMillian 1988, Van Praag 1999, Reynolds *et al.* 2005, Sternberg 2011). Shane ja Venkataramani (2000) rõhutavad, et ettevõtlus kui uurimisvaldkond käsitleb miks, millal, kelle poolt ja kuidas avastatakse, hinnatakse ning kasutatakse ära kasumlikud ärivõimalused toodete ja teenuste pakkumiseks. Wennekers ja Thurik (1999) pakuvad välja, et ettevõtlust võib defineerida kui isikute oskust ja valmisolekut märgata ja luua uusi ärivõimalusi (uusi tooteid, organisatsiooni tüüpe, turge, tootmisviise) ning rakendada oma äriideid turul, tehes asukoha, vormi, ressursside kasutuse, institutsioonide jms kohta otsuseid ebakindluse ning erinevate takistuste tingimustes.

Teoreetilises kirjanduses tehakse vahet innovaatiliste ettevõtjate (*entrepreneur*) ja ettevõtete juhtide (*managers*) vahel, kes moodustavad

enamiku ettevõtte omanikest (Wennekers, Thurik 1999). Seega leiab ka sõna *entrepreneurship* teoreetilises kirjanduses käsitlemist kitsamas tähenduses kui ettevõtlus Eestis tavamõistes. Ettevõtluse mõõtmine on tihti suhteliselt keeruline, sest klassikaliste teoreetikute kontseptsioonidele on raske leida praktilisi ja sobivad empiirilisi mõõdikuid (Van Praag 1999). Tüüpilised mõõdikud on uute ettevõtete sünnimäär, ettevõtete sündide-surmade vahe, väike- ja keskmise suurusega ettevõtted, kus ettevõtte omanik ja juht on üks ja sama isik, kiiresti kasvavad gasellettevõtted ning tipp tehnoloogilised ettevõtted (OECD 1998). Ettevõtluse valdkonna teaduskirjanduses on enim levinud empiirilised mõõdikud, uute ettevõtete sünnid ja füüsilisest isikust ettevõtjad (Westlund 2011). Kaks põhilist lähenemismurka ettevõtete asutamis- ja likvideerimismäärade arvutamiseks on n-ö ökoloogiline lähenemine ning tööjõuturul põhinev lähenemine. Ökoloogilise lähenemise puhul arvutatakse ettevõtete asutamis- ja likvideerimismäär uute ning likvideeritud ettevõtete osakaaluna tegutsevatest ettevõtetest (Audretsch, Fritsch 1994). Tööjõuturul põhineva lähenemise puhul vaadeldakse asutatud ja likvideeritud ettevõtete arvu tööealise elanikkonna suhtes (Armington, Acs 2002).

Uuringuid ettevõtlust mõjutavate tegurite kohta võib jagada kaheks: indiviidikeskne lähenemine, mis keskendub ettevõtjale kui indiviidile ja tema isiksusomadustele, ning ettevõtluskeskkonnale suunatud uuringud, kus vaadeldakse, kuidas välised tegurid (majanduskeskkond, asukoht, institutsionaalsed tegurid jms) mõjutavad ettevõtlust (Shane 2003). Käesolevas töös on fookuses sotsiaal-majanduslike tegurite mõju ettevõtlusele – makromajanduslike, institutsionaalsete, kohalike sotsiaalsete, majanduslike ja demograafiliste muutuste ning asukoha mõju ettevõtlusele Eesti valdades.

Metoodika

Käesoleva doktoritöö aluseks olevad artiklid analüüsivad ettevõtluse ja ettevõtluskeskkonna tegurite erinevaid aspekte Eesti maapiirkonnas, kasutades analüüsiks erinevaid kvantitatiivseid meetodeid. Andmeteks on sekundaarandmed – eelkõige Eesti statistikaameti andmed. Artikkel II põhineb ka 2007. aastal ja 2011. aastal korraldatud põllumajandustootjate küsitluse andmetel.

Artikkel I on ülevaateartikkel, mis käsitleb teaduskirjanduse ja aegriidade analüüsi põhjal Eesti põllumajanduses alates 1980. aastate lõpust toimunud institutsionaalseid ja struktuurseid muutusi ning nende tagajärgi maapiirkonnale. Artikkel II analüüsis multinomiaalse logistilise regressiooni abil, mis mõjutas põllumajandustootjate tegevuse lõpetamist või sektoris jätkamist ja tootmise kahanemist või kasvu aastatel 2006–2011. Käesolevas doktoritöös kasutatakse artiklites I ja II käsitletud kirjandusülevaadet ning peamisi tulemusi, et anda lühiülevaade, missugused protsessid toimusid põllumajanduses ja kuidas need mõjutasid maamajandust.

Artiklid III ja IV vaatlesid kahte piirkonda Eestis – ettevõtlust Lääne-Eesti ja Kirde-Eesti maakondade valdades. Analüüsiks kasutati hierarhilist klasteranalüüsi, et uurida, kuidas rühmitada piirkonna valdu ettevõtluse (ettevõtete arv 1000 elaniku kohta, primaarsektori ettevõtete osakaal, füüsilisest isikust ettevõtjate osakaal, ettevõtete sünni- ja surmamäär) ja sotsiaal-majanduslike näitajate (rahvastikunäitajad, sissetulekute tase) alusel erinevatesse tüüpidesse ning mis neid tüüpe iseloomustab.

Artikkel V põhineb maapiirkonnas ja linnades registreeritud äriühingute finantsnäitajate võrdlusel, mis viidi läbi 2012. a maaettevõtete uuringu käigus (Institute of...2012). Võrreldakse maa- ja linnapiirkonna äriühingute müügitulu ning põhivara investeeringute muutusi aastatel 2005–2010.

Artikkel VI analüüsib ettevõtete asutamisi ja likvideerimisi Eesti kohalikes omavalitsustes aastatel 2005–2012. Kohalikud omavalitsused (KOV) on jagatud kolmeks: linnad, vallad linnade tagamaal (30% tööelistest käib keskuslinna tööle) ja ääremaa vallad. Keskmiste ettevõtete asutamisi- ja likvideerimismäärade võrdlemiseks kasutatakse Kruskali-Wallise ja Manni-Whitney teste. Kohalike omavalitsuste andmeid kasutatakse paneelandmetena kuues fikseeritud efektiga regressioonimudel, et uurida, kuidas majanduskasv ja -langus ning rahvastiku tiheduse, sissetulekute ja töötusmäära muutused mõjutasid ettevõtete sündi ning surmasid erinevat tüüpi omavalitsustes.

Tulemused

Põllumajanduses toimunud muutused üleminekuperioodil plaanimajanduselt turumajandusele

1980. aastate keskel oli Eesti põllumajandus oma toodangu ja palkade poolest üks kõige arenenumaid Nõukogude Liidus. Kolhoosidel ja sovhoosidel oli tähtis osa ka mittepõllumajanduslike teenuste ja hõive pakkumisel (I). Võrreldes Lääne-Euroopa riikidega, kus põllumajanduse osatähtsus majanduses oli eelnevatel kümnenditel sujuvamalt vähenenud, oli Ida-Euroopa riikides üleminekuperioodi alguses põllumajanduse tähtsus maamajanduses ja tööhõives suurem (Csaki 2008, Buchenrieder, Möllers 2011). Ka Eestis oli primaarsektoris hõivatud üle poole maaelanikkonnast (III). 1980. aastate lõpu- ja 1990. aastate algusperioodi ettevõtluskeskkonda iseloomustab struktuurikatkestus – majanduse restruktureerimine, institutsionaalsed reformid ja varasemate majandussuhete katkemine (I, II). Institutsionaalsed muutused said alguse 1988. aasta õigusaktide ja 1989. aasta taluseadusega, millega loodi võimalus eraomandil põhinevate talude tekkimiseks (I, II). Samal ajal tehti ka esimesi samme eraettevõtluse legaliseerimiseks ja selle õiguslike aluste väljatöötamiseks. 1989. aastal seadustati aktsiaseltsid ja 1990. aastal muude majandusühingute tegevus (Kuura 2006). 1991. aasta taasiseseisvumise ning omandireformi aluste ja maareformi seadusega ning 1992. aasta põllumajandusreformi seadusega jätkus üleminek sotsialistlikult plaanimajanduselt eraomandil põhinevale turumajandusele (I, II). Kollektiviseeritud varade tagastamise ja privatiseerimise ning samal ajal ettevõtluse jaoks seadusliku raamistiku kujundamisega kasvas 1990. aastatel kiiresti nii põllumajandustootjate (tagastatud ja asutatud talud, äriühingud) kui ka mittepõllumajanduslike ettevõtete arv.

Suurem osa 1990. aastatel tekkinud põllumajanduslikest majapidamistest ei osutunud majanduslikult elujõuliseks. Primaarsektoris kadusid töökohad kiiresti. Taastatud talud olid enamasti liiga väikesed ega vajanud või ei suutnud luua palgalisi töökohti. Kolhooside ja sovhooside varade abil ilmavalgust näinud äriühingud ei vajanud varasemas mahus tööjõudu (I, II). KOV-d võtsid üle varem kolhooside ja sovhooside pakutavad teenused ning taristu, kuid sellele vaatamata kadusid maapiirkonnas paljud varasemad teenused ja nendega seotud töökohad (Alanen 2004).

EL-iga liitumisel 2004. aastal ja ühise põllumajanduspoliitika (ÜPP) rakendamisel, sh põllumajandustoetuste maksmisel ning kiirel majanduskasvul 2000. aastate keskel oli positiivne mõju põllumajandusele ja toodangumahtudele. Samal ajal vähenes aga põllumajanduslike majapidamiste arv 2001. aastal 55 700-lt 16 700-ni 2016. aastal. (SE 2017). Põhilised põllumajandussektorist väljujad olid väiketootjad, vanemad põllumajandustootjad ja need, kellel oli töökoht väljaspool oma põllumajandustootmist (II).

Ettevõtlus valdades aastail 2005–2012 ja sotsiaal-majanduslike tegurite mõju ettevõtlusele

Ettevõtete asutamiste ja majanduslikult aktiivsete ettevõtete arv on Eestis viimase kümne aasta jooksul kiiresti kasvanud. Valdades registreeritud ettevõtete osakaal on olnud suhteliselt stabiilselt 1/3 Eestis registreeritud ettevõtetest (SE 2015). Samas on aga erinevate piirkondade osakaal muutunud – suuremate linnade tagamaal asuvate valdade ettevõtete osatähtsus on suurenenud. 2012. aastal asus pool kõikidest valdades registreeritud ettevõtetest suuremate linnade, sh põhiliselt Tallinna ja Tartu tagamaal (SE 2015).

Eesti ettevõtetest enamiku moodustavad kuni üheksa töötajaga mikroettevõtted. Maapiirkonnas on mikroettevõtete osakaal keskmiselt veelgi suurem, eriti äärealadel. Eestis on tavalised ühe töötajaga või palgaliste töötajateta ettevõtted (Institute of ... 2012).

Viimasel kümnendil on oluliselt suurenenud teenindussektori osakaal valdades registreeritud ettevõtetes, näidates jätkuvat maamajanduse ümberstruktureerimist. Uute ettevõtete hulgas on ülekaalus teenindussektori ettevõtted. Ääremaa omavalitsustes domineerivad aga primaarsektori ettevõtted (III, IV).

Artiklid III ja IV analüüsisid arengusuundi kahes piirkonnas – Kagu-Eesti ja Lääne-Eesti valdades. Lääne-Eesti saarte vallad eristuvad Eesti keskmisest väiksema asustustiheduse poolest, millega saab seostada keskmisest suuremat FIE-de ja mikroettevõtete osakaalu. Samas on saartel majanduslikult aktiivsete ettevõtete arv 1000 elaniku kohta Eesti keskmisest ja Kagu-Eesti valdade keskmisest suurem ning mitmed KOV-d paistavad silma uute mittepõllumajanduslike ettevõtetega. Üks

selgitus võib olla see, et kohalikud eripärad lubavad korraka nii võimalus- kui ka vajadusettevõtlust. Eraldatus mandrist, rahvastiku vähenemine ja kohaliku majanduse väiksus tähendab piiratud töövõimalusi, mistõttu elanikud on sunnitud ettevõtlusega tegelema. Kuid kohalik looduslik eripära, näiteks rannik turismimajanduse edendamiseks ja kinnine kohalik turg, loob ettevõtlusvõimalusi. Elanike sissetulekud on suuremad seal, kus kohalik majandus on mitmekesisem. Regioonide sees on linnade tagamaa ja keskmisest suuremad vallad need, mis on demograafiliselt paremas olukorras, FIE-de osakaal on väiksem ning majandustegevus mitmekesisem. Samas võib ettevõtete arv 1000 elaniku kohta olla palju väiksem kui ääremaalistes valdades, sest tagamaale keskuseks olev linn pakub töökohti ja teenuseid. Seetõttu on vajadus ettevõtlusega tegelemiseks väiksem kui piirkonna ääremaadel.

Äriühingute osakaal ettevõtete seas on olnud valdades palju väiksem. Suure osa FIE-dest on moodustanud primaarsektoris tegutsevad põllumajandustootjad (Institute of ... 2012), kelle arv on aga statistikaameti (2016) andmetel 2010. aastast alates vähenenud. Uued ettevõtted on peamiselt osäühingud. Maapiirkondade arengu jaoks on problemaatiline Eesti keskmisest palju väiksem investeringute ja käibe maht äriühingutes (V).

Ettevõtete asutamismäär oli töös vaadeldud perioodil likvideerimismäärast kõrgem – keskmiselt 4,59 ettevõtte asutamist 1000 tööealise elaniku kohta aastas. Ettevõtete likvideerimismäär 1000 tööealise elaniku kohta oli 2,74 (VI). Kuigi majanduskriisi ajal ettevõtete asutamiste arv mõnevõrra vähenes, on alates 2005. aastast üldine suundumus olnud ettevõtete asutamise- ja likvideerimismäära järjepidev tõus.

Uuritud perioodil loodi ja likvideeriti Tallinnas pooled ettevõtted. Valdadest oli kõrgem sünni- ja surmamäär Tallinna tagamaa valdades ning Tartu ja Pärnu tagamaal. Käesolevas töös vaadeldud perioodil oli keskmine kõrgeim ettevõtete asutamismäär 16 ja madalaim määr ainult 0,53 asutamist 1000 tööealise inimese kohta aastas. Ettevõtete tegevuse lõpetamise puhul oli vahe mõnevõrra väiksem – kõrgeim ettevõtete likvideerimismäär oli 9,98 ja madalaim 0,48 ettevõtte likvideerimist 1000 tööealise kohta aastas (VI).

Artiklis VI tehtud võrdlused tõid välja statistiliselt olulised erinevused linnade, linna tagamaade ja ääremaa valdade ettevõtete asutamise- ning likvideerimismäärades ja sotsiaal-majanduslikus arengus. Keskmine ettevõtete asutamismäär linnade tagamaal asuvates valdades oli aastatel 2005–2012 6,8 uut ettevõtet 1000 tööealise inimese kohta, mis oli palju kõrgem kui linnades (5,0) või ääremaa valdades (3,8). Samamoodi oli ka ettevõtete keskmine likvideerimiste arv linnade tagamaal statistiliselt oluliselt suurem. Majanduslanguse aastatel uute ettevõtete sünnimäär mõnevõrra kahanes linnade tagamaa valdades ja linnades, aga uute ettevõtete arv suurenes aastatel 2011–2012 kiiresti. Ettevõtete likvideerimiste arv linnade tagamaal ja linnades mõnevõrra vähenes, aga oli siiski võrreldes majanduslanguse eelsete aastatega suur, viidates jätkuvalt suurele majanduslikule volatiilsusele. Ääremaa vallad olid ainuke tüüp, kus ettevõtete asutamise arv majanduslanguse aastatel 2008–2010 ei vähenenud. Võrreldes varasemate perioodidega jäi asutamismäär 1000 tööealise inimese kohta madalamaks ka linnades ja nende tagamaadel.

Paneelandmetega läbi viidud fikseeritud efektiga regressiooni eesmärk oli võrrelda, kas sotsiaal-majanduslikud tegurid – majanduskasvu periood, kohalike elanike sissetulekute tase, töötuse määr ja rahvastiku muutus – mõjutavad erinevat tüüpi kohalikes omavalitsustes ettevõtete asutamist ning likvideerimist erinevalt. Kõige suurem mõju oli majanduslangusel ja sissetulekute taseme muutusel. Indikaatori mõju oli aga erinevat tüüpi omavalitsustes sarnane. Sissetulekute suurenemine mõjutas positiivselt uute ettevõtete asutamise määra. Majanduslangus vähendas ettevõtete asutamisi linnades ja linnade tagamaadel ning suurendas ettevõtete likvideerimisi igat tüüpi kohalikes omavalitsustes. Rahvastiku tiheduse muutus mõjutas ainult ettevõtete likvideerimismäära linnade tagamaadel – rahvastikutiheduse suurenemisega likvideeriti ettevõtteid rohkem. Töötuse määra muutusel ei olnud regressioonimudelites mõju (VI).

Arutelu

Institutsionaalsed muutused toimuvad tavaliselt suhteliselt aeglaselt (Baumol 1990). Samas iseloomustavad üleminekuperioodi plaanimajanduselt turumajandusele väga kiired institutsionaalsed ja

struktuursed muutused, kus mõne aasta jooksul muutusid oluliselt nii seadusandlus, omandisuhted kui ka varasemad majandussuhted ja -struktuurid. Ühest küljest tekitasid need protsessid palju uusi ettevõtlusvõimalusi. Teisest küljest aga iseloomustas ettevõtluskeskkonda varasemate turgude, toetuste ja majandussuhete katkemine koos üldise majanduslanguse ning ebakindlate institutsionaalsete suhetega (I, II, VI). See seadis uutele ettevõtetele palju takistusi, mistõttu ei osutunud suur osa neist elujõuliseks. Mitmed autorid (Alanen *et al.* 2001, Nikula 2004b) rõhutavad, et põllumajanduses toimunud langusel oli suur mõju just mittepõllumajanduslike ettevõtete arenguvõimalustele, sest koos põllumajandusliku hõivega kadus suurel osal maapiirkonna elanikest sissetulek. See omakorda tähendas, et kohalik nõudlus oli ebapiisav sellest sõltuvate mittepõllumajanduslike ettevõtete ellujäämiseks.

Nagu mitmeid teisi riike, näiteks Balti riike (Sauka, Welter 2014) ja viimastel aastakümnetel ka Lääne-Euroopa riike (Mason 1991), iseloomustab ka Eestit ettevõtluse koondumine aglomeratsioonidesse, tüüpiliselt pealinna linnastusse ja paari suurema linna tagamaale. Kesk-Eestis, kus põllumajanduse osatähtsus on keskmisest suurem, oli ettevõtete keskmine asutamise määr 1000 elaniku kohta madal (VI). Kirde-Eestis on ettevõtluse areng valdades olnud suhteliselt piiratud – suundumus, mis iseloomustab ka paljusid Lääne–Euroopa vanu ja kahaneva rahvastiku ning majandusega tööstuspiirkondi (Mason 1991).

Smallbone (2009) rõhutab, et maapiirkonnad on väga mitmekesised ja maa-linna võrdluses ei pruugi maapiirkond alati olla mahajäänud, sest ligipääsetavatel ning hea asukohaga piirkondadel läheb tihti päris hästi. Seda näitavad ka artiklis VI toodud analüüsi tulemused – linnade tagamaadel asuvaid valdu eristab nii linnadest kui ka ääremaalistest valdadest oluliselt kõrgem ettevõtete asutamise- ja likvideerimismäär, rahvastiku ja sissetulekute suurem kasv ning väiksem töötus. Linnade tagamaadel asuvaid valdu mõjutavad enim nii positiivsed kui ka negatiivsed aglomeratsiooniefektid.

Analüüsitud sotsiaal-majanduslikest teguritest oli elanike sissetulekul ja makromajanduslikul keskkonnal kõige suurem mõju ettevõtete asutamistele ning likvideerimistele valdades; samas oli aga nende tegurite mõju erinevat tüüpi valdades samasugune. Sissetulekute suurenedes tõusis ettevõtete asutamise- ja likvideerimismäär nii linnade

tagamaadel kui ka ääremaadel asuvates valdades. Majanduslanguse perioodil langes ettevõtete asutamismäär ja tõusis likvideerimismäär (VI). Sotsiaal-majanduslike tegurite mõjuga sarnane mõju toetab lähenemist, kus maaettevõtlust käsitletakse mitte kui midagi maapiirkonnale eriomast, mille puhul maalise keskkonna eripära mõjutab ettevõtlusprotsessi ennast, vaid kui maapiirkonnas toimuvat ettevõtlust, mis ei erine oma sisult linnapiirkondade ettevõtlusest, ning maaline lihtsalt iseloomustab keskkonda, kus ettevõtlusprotsess toimub (Baumgartner *et al.* 2013a). Arvesse peab võtma, et mitmete lääneeriikidega võrreldes on Eestis maa- ja linnapiirkondade erinevused (näiteks rahvastikutihedus) suhteliselt väikesed, mis võib ka seletada erinevuste puudumist sotsiaal-majanduslike tegurite mõjus.

Sissetulekute suurenemine on iseloomulik kasvavale majandusele, mis pakub uusi ettevõtlusvõimalusi (Reynolds *et al.* 1994, Verheul *et al.* 2001). Elanike sissetulekute kasv suurendab nõudlust uute ettevõtete toodete ja teenuste järele ning samas võimaldab koguda kapitali ettevõtlusega alustamiseks. Eesti valdades asutatud uute ettevõtete seas on ülekaalus teenindussektori ettevõtted (V, VI), mis tähendab aga suurt sõltuvust kohaliku tarbijaskonna ostuvõimest või vajadust meelitada oma teenustele ligi tarbijaid väljastpoolt ettevõtte tegutsemispiirkonda. Seega on uute ettevõtete jaoks atraktiivsemad vallad, kus tarbijate sissetulekud kasvavad kiiremini (linnade tagamaad) või mille eripära (näiteks asukoht rannikul) loob ettevõtlusvõimalusi. Delfmann *et al.* (2014) rõhutavad, et ka ääremaalistes piirkondades on vajadus kaupade ja teenuste järele, mistõttu peaks teatud kohalik nõudluse baastase jääma alles ka kiiresti väheneva rahvastikuga maaomavalitsustes. Samas on aga tähtis arvestada Eesti kogemust, kus majanduskriis mõjutas oluliselt enam maapiirkonna teenindussektori mikroettevõtjaid (Institute of ... 2012, Põder *et al.* 2013), sest majanduslanguses tarbijad vähendasid kõigepealt selliste toodete ja teenuste tarbimist, mis polnud nende jaoks esmatarbekaabad. Selliste teenindussektori ettevõtete osakaalu suurenemine maaettevõtete hulgas tähendab seega ka seda, et maamajandus on rohkem avatud makromajandustsükli mõjule.

Põllumajanduses toimunud struktuurimuutus ja põllumajandusliku tööhõive vähenemine peaks suurendama nii nõudlust kui ka pakkumist mittepõllumajandusliku maaettevõtluse osas. Varem põllumajanduses tegutsenud inimesed vajavad mittepõllumajanduslikke töökohti ja samas on nad potentsiaalsed uute ettevõtete loojad. Kuid vaatamata uute,

peamiselt teenindussektori ettevõtete asutamisele ja põllumajanduslike majapidamiste arvu suurele vähenemisele ääremaalistes valdades on põllumajandusel majandustegevuses veel keskne roll (V, VI). Maapiirkonna ettevõtluse mitmekesisus on eriti ääremaa valdades jäänud väga piiratuks ja põllumajanduse osa vähenemisel ei ole esile kerkinud muu valdkonna tegevusi, mis suudaksid piisavalt pakkuda kohapealset hõivet elanikele ja sissetulekut ettevõtjatele. Teenindussektori ettevõtete kiire arenguga linnade tagamaa valdades muutuvad üha erinevamaks ettevõtluse arengumustrid maapiirkonna sees, mis tähendab, et erinevatel valdadel on ka eriomased probleemid ja vajadused.

Üks institutsionaalne tegur, mis mõjutas uute ettevõtete loomist, on ettevõtluspoliitika, millega 2011. aastal seadustati osaühingute (OÜ) asutamine osakapitali sisse makseta. Käesolev analüüs ei võimalda täpselt hinnata, kui suur on selle seadusandliku muutuse mõju ettevõtete asutamisele valdades, aga võib eeldada, et sellel on olnud suur mõju uute ettevõtete registreerimise soodustamisel majanduskasvu poolest väga ebastabiilsetel aastatel (näiteks 2011–2012), sest alates 2011. aastast on sisse makseta asutatud OÜ-d moodustanud üle poole uutest ettevõtetest (State Portal 2015). Töös vaadeldud perioodil 2005–2012 kasvas ettevõtete asutamismäär enim ääremaalistes valdades, kuigi nende valdade asutamismäär jäi keskmiselt alla asutamismäärale linnade tagamaade valdades ja linnades (VI). Seega võib arvata, et ääremaalised vallad, kus sissetulekute tase ja seega võimalused kapitali kogumiseks on olnud keskmisest palju väiksemad, on saanud sellest seadusandlikust muutusest enim kasu, sest sellega on vähendatud ettevõtlusesse sisenemise barjääre.

Artiklis VI läbi viidud analüüsi tulemused olid sarnased Kangasharju (2000) tulemustega, mis näitasid, et rahvastiku muutustel valdades polnud mõju uute ettevõtete loomise määrale. Ettevõtete asutamismäär oli väga kõrge mitmetes ääremaalistes valdades (näiteks rannikul), mille rahvaarv on alates taasiseseisvumisest kiiresti vähenenud. Uute ettevõtete suur arv võib tuleneda nii vajadus- kui ka võimaluspõhisest ettevõtlusest, kus ühest küljest puuduvad kiiresti väheneva rahvastikuga piirkondades muud teenimisvõimalused, mistõttu elanikel tuleb ise ettevõtjaks hakata, kuid samas pakub nende asukoht unikaalseid ettevõtlusvõimalusi.

Varasemad uuringud töötuse mõjust ettevõtlusele on näidanud üksteisele vastukäivaid tulemusi (Verheul *et al.* 2001). Käesolevas analüüsis polnud töötuse määral valdades ettevõtlusele suurt mõju. Samas peab aga arvesse võtma, et käesolevas analüüsis võrreldi sama aasta töötuse andmeid ettevõtluse andmetega. Töötuse mõju, näiteks vajaduspõhise ettevõtluse suurenemine, võib ilmnedu suurema ajanihkega.

Maapiirkonna ettevõtted on tüüpiliselt väiksemad kui linnapiirkonna ettevõtted (IV) ning majanduskriis mõjutas nende keskmist müügitulu ja investeringuid rohkem (V). Mitmed uuringud on viidanud sellele, et maapiirkonna ettevõtete ellujäämismäär on tihti kõrgem kui linnapiirkonna ettevõtetes (Smallbone *et al.* 1999, Smallbone *et al.* 2003, Yu *et al.* 2011). Sellele viitab ettevõtete madalam likvideerimismäär ääremaalistes valdades (VI). Kuna uute ettevõtete arv on nendes valdades väike, on ettevõtluse areng perifeersetes piirkondades sellele vaatamata olnud väga piiratud.

Järeldused

Analüüsis püstitatud viiest hüpoteesist neli leidis kinnitust.

1. Üleminekuperioodil põllumajanduses toimunud muutustel oli suur mõju valdade mittepõllumajanduslikule ettevõtlusele, sest põllumajandustoodangu vähenemine ja töökohtade kiire kadumine viis suure osa maapiirkondade elanike sissetulekute kadumiseni ning vaesumiseni. Enamikus valdades oli mittepõllumajandusliku ettevõtluse areng väga piiratud ega suutnud kompenseerida põllumajanduses kadunud töökohti (I, IV, VI). Seetõttu vähenes ka kohalik nõudlus mittepõllumajanduslike ettevõtete toodete ja teenuste järele, kujundades maapiirkondades suhteliselt ebasoodsa keskkonna ettevõtluseks.
2. Ettevõtluse areng Eesti erinevates piirkondades ja erinevat tüüpi valdades on väga erinev (III, IV, VI). Linnade, eelkõige Tallinna, Tartu ja Pärnu tagamaadel asuvaid valdu eristab nii linnadest kui ka ääremaalistest valdadest palju kõrgem ettevõtete asutamis- ja likvideerimismäär (VI).

3. Hüpotees, et EL-iga liitumise järgsel perioodil oli kohalikel sotsiaal-majanduslikel ja demograafilistel teguritel erinevat tüüpi valdades ettevõtlusele erinev mõju, ei leidnud kinnitust. Elanike sissetulekute ja makromajandusliku keskkonna mõju ettevõtete asutamisele ning likvideerimisele oli erinevat tüüpi valdades samasugune (VI).
4. Majanduslangusel oli ettevõtete asutamisele ja likvideerimisele erinev mõju (VI). Nii linnades kui ka linnade tagamaadel langes aastatel 2008–2010 ettevõtete asutamismäär. Võrreldes majanduskasvu aastatega 2005–2007 oli majanduslanguse aastatel 2008–2010 ja majanduslanguse järgsetel aastatel 2011–2012 ettevõtete likvideerimismäär oluliselt kõrgem.
5. Majanduslanguse perioodil oli keskmise käibe ja investeeringute vähenemine maapiirkonna äriühingu kohta suurem ning taastumine aeglasem kui linnapiirkonnas registreeritud äriühingute puhul (V).

Edasist uurimist vajavad probleemid

Maapiirkonna rahvastiku ja ettevõtluse koondumine linnade tagamaadele tõstatab küsimuse maapiirkondade määratlusest. Maapiirkondade arengule suunatud poliitilised meetmed peavad arvesse võtma, et linnade tagamaade ja ääremaade arengumustrid, vajadused ning probleemid muutuvad üha mitmekesisemaks ja keerulisemaks.

Osäühingute osakapitali sissemakseta asutamine on meede, mis vähendab oluliselt ettevõtlustegevuse takistusi. Arvestades, et ettevõtete registreerimiste arv on järjekindlalt suurenenud ja suur osa neist on seda meedet kasutanud, siis võib hinnata, et selline lähenemine on edukalt täitnud eesmärki suurendada uute ettevõtete arvu. Poliitika eesmärk ei peaks olema mitte uute registreerimiste maksimeerimine, vaid uute ettevõtete loodav majanduskasv ja töökohad. Neid eesmarke võib aga ettevõtlustegevuse alustamiseks piisavate ressursside puudumisel olla keeruline saavutada. Seega on ettevõtluspoliitika tulemuslikkuse hindamiseks vajalik uurida, milline on nende ettevõtete areng pikemas perspektiivis.

Artiklis V läbi viidud linna-/maaäriühingute võrdlus on suhteliselt piiratud ja käsitleb lühikest perioodi. Seda analüüsi on tähtis laiendada,

vaadeldes pikemat perioodi, ettevõtete täpsemat asukohta, rohkem finantsnäitajaid ja tegevusalasid. See annaks täpsemat teavet nii potentsiaalsetele ettevõtjatele ja investoritele kui ka poliitikakujundajatele maapiirkonnas registreeritud ettevõtete arengutakistuste kohta.

Varasemad uuringud (Vaessen, Keeble 1995, Smallbone *et al.* 1999, Bryden, Munro 2000, Siemens 2010) on käsitlenud erinevaid strateegiaid, mis aitavad perifeersete piirkondade ettevõtetel kohaneda neid ümbritseva keskkonnaga. Sarnased uuringud Eestis näitaksid kohalikele ettevõtjatele edukaid kohanemisstrateegiaid ja annaksid teavet, kuidas kasutada kohalikke ressursse ka ebasoodsamates piirkondades.

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20 years of transition – institutional reforms and the adaptation of production in Estonian agriculture

20 Jahre Transformation – institutionelle Reformen und Anpassung der landwirtschaftlichen Produktion in Estland

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Abstract

This article provides an overview of the most important reforms, their background, and corresponding changes in Estonian agriculture during the transition period from 1988-2008. The past two decades have been divided into three sub-periods to outline differences in dynamics and the direction of changes in agriculture. From 1988-1995, the main reforms were implemented and agricultural production decreased rapidly. From 1995-2001, the decline stabilised and nonviable farms exited the sector. From 2001 onwards, the positive effects of the EU pre-accession period and EU membership can be observed.

Key words

transition; institutional reforms; EU enlargement; Estonian agriculture

Zusammenfassung

Das Ziel des vorliegenden Artikels ist es, einen Überblick über die wichtigsten Veränderungen in der estnischen Landwirtschaft im Transformationszeitraum 1988-2008 zu geben. In den letzten zwei Jahrzehnten gab es drei Entwicklungsperioden. 1988-1995 wurden die wichtigsten Reformen durchgeführt, und die landwirtschaftliche Produktion ist stark gesunken. 1995-2001 hat sich der Rückgang stabilisiert, der Sektor war teilweise nicht lebensfähig, und private Betriebe haben den Sektor verlassen. Seit 2001 kann man die positiven Auswirkungen des EU-Beitritts auf die Landwirtschaft beobachten.

Schlüsselwörter

Transformation; institutionelle Reformen; EU-Erweiterung; estnische Landwirtschaft

1. Introduction

Since the Republic of Estonia regained its independence in 1991, major reforms have been implemented in all spheres of governance and economy. Reforms in the agricultural sector, however, began at the end of 1980s when the start-up of private farms was legalised. From 1990-1992 land, proprietorship, and agricultural reforms were initiated. These reforms were aimed at reorganising the agricultural sector into private farms and restituting land that was nationalised during the Soviet era. In the 1990s, Estonia applied an extremely liberal economic policy without trade barriers on food and agricultural commodities. In 1996, the decision to attain European Union (EU) membership was taken. Since then, Estonian legislation, together with agricultural policy, has been consistently harmonised with EU laws and policies. The pace of harmonisation accelerated from 2001-2004 and from 1 May 2004, together with nine other CEECs (EU-10), Estonia became a member of the

in Common Agricultural Policy (CAP) application between the old and new member states are related to direct payment schemes, and notable differences in subsidy levels. Therefore, the transition of agricultural sectors of the EU-12 will continue during the upcoming EU budget period of 2014-2020, i.e., for 10 more years.

Therefore, the aim of this paper is to present an overview of the institutional reforms since the end of 1980s, whilst comparatively following the changes in structures, production volumes, productivity, and trade patterns in the Estonian agricultural sector. Interrelations of the reforms and performance of the agricultural sector are discussed. The period of 1988-2008 is divided into three sub-periods to display the differences in dynamics and the direction of changes in these sub-periods. The first phase of transition was from 1988-1995, when major reforms were initiated and previous production relationships collapsed. From 1995-2001, a reorganised and privatised agricultural sector adapted to the new institutions and markets. From 2001 onwards, the impact of the impending EU accession could be detected. This article is organised as follows – major reforms and developments in agriculture are reviewed in the second section. Changes in the performance of agriculture are examined in the third section. The causal relationships between the reforms and the development of agriculture are discussed throughout the article. In the fourth section, principal conclusions are drawn.

2. Institutional reforms and agricultural policy

2.1 Pre-transition period

At the end of 1980s, Estonian agriculture was one of the most developed in the Soviet Union (USSR) (JINT et al., 2005). The agricultural sector specialised in livestock and dairy production, which was mainly exported to the cities of the Russian SSR, notably Leningrad (St. Petersburg) only some 300 km away from Estonia (WALTER-JORGENSEN and LUND, 1997; TOMSON, 1999; SILBERG, 2001; UNWIN, 1997: 97). Estonia was the highest per capita producer of milk and meat in the USSR, exceeding even EU and USA averages (see table 1). In the USSR, the average Estonian milk yield was the highest and cereal yields were second after the Moldavian SSR. While milk yield was comparable to the EU level in 1985, cereal yields lagged behind both EU and USA averages. High productivity and increasing production resulted in a rising level of wages. Estonian collective farm workers had higher aver-

Table 1. Agricultural productivity characteristics in selected states of the USSR, EU and USA in 1985

	Average milk yield, kg/cow	Milk production per capita, kg	Meat production per capita, kg	Weighted average yield of cereals in 1981-1985, hkg/ha	Average monthly wage in kolkhozes in 1986, rubles
Estonian SSR	3 966	817.1	140.1	26.1	284
Latvian SSR	3 362	746.4	123.6	21.5	223
Lithuanian SSR	3 444	825.1	139.9	23.6	197
Ukrainian SSR	2 601	451.8	76.8	24.3	148
Russian SSR	2 347	348.2	59.1	14.0	180
USSR in total	2 451	353.7	61.4	14.9	163
EU*	3 986	402.3	89.6	47.7	-
USA*	5 913	267.1	106.3	42.9	-

* Data for EU and USA was obtained from FAOSTAT (2009).

Source: STATISTICAL YEARBOOK (1986)

A remarkable part of the infrastructure in rural areas was funded from agricultural income (EMA, 2005: 32). Also, collective farms provided a variety of agricultural and non-agricultural services to rural residents (SILBERG, 2001; RAAGMAA, 2002; KALMI, 2003).

2.2 Changes from 1988-1995

Reforms in Estonian agriculture began in 1988, when regulations were adopted for the allocation of the marginal land of collective farms to private farms, as well as the selling of agricultural machinery to private farms (EMA, 2002). The Farm Law of 1989 envisaged the establishment of hereditary (based on the pre-collectivisation farms) and new tenant farms (on rented land) (MAIDE, 1995).

In 1991, the principles of the Ownership Reform Act were adopted. The main goals were the reorganisation of pecuniary circumstances in order to guarantee intact proprietorship and free business activity, the redemption of injustice, and the foundation of preconditions for the restitution or compensation of former proprietors or their heirs.

Land and agricultural reforms were the two major reforms that aimed to transform Estonian agriculture and society from a planned economy to a capitalist market economy (ALANEN, 1999; SARRIS et al., 1999). The Estonian Land Reform Act was adopted in 1991. In the CEECs, land reform involved two separate issues: the legal demands of pre-collectivisation landowners ('historical justice'), and social equity concerns (SWINNEN, 1999: 638). In order to address those issues, the goal of the land reform was to return land to its lawful owners. The reform also enacted the privatisation of land by pre-emptive rights (for people whose buildings were located on land subject to privatisation) or on general grounds (for rural inhabitants in the vicinity of their homes) (EMA, 2002).

Initially, the main focus of land reform was on restitution, and the first returned cadastral units were registered in 1993. The land reform process intensified from 1996 onward, and the privatisation of free agricultural and forestlands began in 1999 (EMA, 2005). The process progressed slowly because of complex legal and administrative issues. By the end of 1996, around 12% of land had been registered in the land cadastre; this number rose to 51% by the end of 1999, 78% by the end of 2004, and by March 2009, 84% of land had been registered (ELB, 2009). About 40% of that land is restituted; 35% is state-owned with 0.7% in

municipal ownership; 19% is privatised or bought; and around 6% is free agricultural or forestland.

The Land Reform Act was amended more than 30 times in the 10 years following its adoption. Slow land reform hindered the development of agriculture due to uncertain property relations. Part of the problem was that neither the complexity of the land reform nor the conflicts had been foreseen (ULAS, 2006). Another issue arose from the restitution of land according to the pre-war farm boundaries. The average size of a farm was 22.7 hectares in 1939, of which only 7.9 hectares were arable land (VIRMA, 2004: 188). Restitution resulted in even more fragmented land ownership, since land was typically apportioned to several heirs (ALANEN, 1999: 440). Hence, the resulting farmland units were usually too small to be economically viable. The fragmentation of agricultural land was also a problem in Latvia and Lithuania (DAVIS, 1997).

The Agricultural Reform Act of 1992 formed the basis for the liquidation of collective farms and the establishment of new farms and agricultural enterprises (EMA, 2002). The aims of agricultural reform were to return assets and compensation to the lawful pre-World War II owners, but also to privatise the assets of collective farms (production plants, livestock, machinery, etc.). For both land and ownership reforms, agricultural reform became a complicated and contradictory process that led to much dispute.

The implementation of agricultural reform was decentralised. Reform plans were made at the local level and required the approval of both the members and employees of collective farms (ALANEN 1999: 441-442). Each collective farm established a local reform committee with an equal number of representatives from the collective farm, the local municipality and private farms. The committee formulated the content of a reform plan (MAIDE, 1995). The plan was approved by the municipal council and the legitimacy of transfers of various assets was confirmed by a lawyer. In the majority of cases, however, power remained firmly in the hands of the collective farm leadership (ALANEN, 1999).

All workers and members of the collective farms were entitled to ownership of its assets. Privatisation was usually performed through an auction, where one could pay with either privatisation vouchers, which had been distributed to collective farm members according to individual 'work shares' (based on workdays and salary), or with compensation vouchers, which were issued for the compensation of

property that had not been returned to former owners or heirs (ALANEN, 1999: 442).

The reform did not insist upon the liquidation of collective farms, but rather their liquidation as legal entities and reorganisation as market economy enterprises. The exact nature of the reorganisation and privatisation, and whether technological units remained intact and functional depended on the local reform plan and the committee. Usually the local reform committee and public opinion was inclined towards liquidation (KAUBI, 1999). TAMM (2001: 434) assesses that 2-3% of large-scale farms remained undivided. Several of Central Estonia's richest and largest collective farms were reorganised into partnerships which today remain among the largest agricultural enterprises in Estonia.

By the deadline of agricultural reform at the end of 1996, 361 former collective farms had been transformed into 710 co-operatives, 600 partnerships, 1,411 joint-stock companies and 13,513 private farms (TAMM, 2001: 435). While property reform, restitution and privatisation were nearly completed (EMA, 2003) by 1996, land reform was still progressing slowly.

The privatisation of land has been considered the least successful part of the reforms (JEFFRIES, 2004); the lack of connection between land and agricultural reforms is identified as one of the largest problems (IVASK, 1997; ALANEN, 1999; TAMM, 2001). The procedure of returning land was so complicated that it remained far behind the separation of assets (ALANEN, 1999: 442). Reforms created conflicts of interest between the owners of the production assets of limited companies, farms and the applicants for land restitution who had the right to restore their land to its previous boundaries (EMA, 2003: 51). The problem was that privatised producers could no longer continue the tenure of former collective farmland (TAMM, 2001). Uncertainties about land use rights hindered the development of agriculture by increasing the risk of investments and complicating credit opportunities, as agricultural enterprises lacked collateral in the form of land property (EMA, 2003).

New farms lacked the necessary equipment and financial capital (TAMM, 2001; SIRENDI, 2009; JULLINEN, 1997). The farmers who had privatised machinery from former collective farms had technology that had been designed for 1,200-1,500 hectare farms, and therefore was unsuitable for small farms (EMA, 2003). Many entrepreneurial, rural people migrated to towns and the adaptation to the new economic situation in the agricultural sector during the 1990s was slow (IVASK, 1997). Quite often, new owners of land or production means did not have prior experience in or knowledge of farm management (UINT et al., 2005; SIRENDI, 2009), nor did they have an interest in continuing production; therefore, they sold the assets. JÖRGENSEN and STJERNSTRÖM (2008: 96) have pointed out that well-defined and secure property relations were not established at the same pace, as new owners began exploiting their land and forests. It is estimated that ¾ of returned and compensated assets left the agricultural sector in 1990s (EMA, 2003).

In 1991, the seemingly unlimited market for agricultural output disappeared with the collapse of the USSR (ALANEN, 1999; REILJAN, 2000). The inflation caused by the rapid

deregulation of the market and the subsequent decline in consumer demand reduced demand for domestic foodstuff (ALANEN, 1999). From 1991-1994, the prices of inputs increased 17.5 times, while producer prices of agricultural products increased 11.5 times. Food retail prices increased 28.9 times after USSR consumer subsidies were terminated (OECD, 1996: 47). Therefore, the terms of trade for agricultural producers deteriorated and consumers were faced with much higher food prices. In 1992, all subsidies were terminated and prices liberalised. The OECD (1996) calculations on the percentage of producer support estimates (PSE) illustrate the drastic change from 1991-1992 (see table 2).

Table 2. PSE estimates in Estonia, EU, USA, Finland, Sweden in 1986-1994

	1986	1987	1988	1989	1990	1991	1992	1993	1994
Estonia	75	76	77	77	70	58	-76	-24	-4
EU-12	50	49	46	41	47	48	47	49	49
USA	35	32	23	20	23	22	22	23	20
Finland	65	69	70	68	71	72	66	64	69
Sweden	57	57	52	51	58	63	58	54	51

Source: OECD (1996)

The determination to follow a liberal economic policy resulted in a considerable inflow of foreign direct investment and a rapid transformation of the economy, but it had painful costs for the agrarian sector and, subsequently, rural development (UNWIN, 1998: 293). A liberal trade regime provided a competitive advantage to subsidised imports, which in turn caused a decline in agricultural prices during 1992-1994 by an average of ½ compared with the world markets (EMA, 2003). Agricultural producers had to compete with cheap foreign imports, yet foreign markets were protected with high trade barriers (LEETSAR, 1996; UNWIN, 1997; MAIDE, 1995).

The economic situation for farms and agricultural enterprises had not notably improved by the time the first aid schemes (income tax exemptions, and compensation of loan interest payments) were introduced in 1993. Also, the first programmes for agricultural and rural development were initiated in 1993 (EMA, 1999; JURJEV, 2003).

2.3 Changes from 1995-2001

In 1995, Estonia became a net importer of agricultural products. Although farmers demanded restrictions on imports, more subsidies, and solutions to the lagging land reform, their calls were not answered. Restrictions on food imports set by the Agricultural Market Regulation Act in 1995 were largely declarative and had no regulative effects (EMA, 2003). Many farms were not viable due to uneven conditions stemming from the competitive advantage of imported produce (MARRANDI, 2002).

However, together with Estonia's general development, the focus on agricultural policy increased. In 1996 and 1997, a fuel excise tax exemption and capital (investment) support were adopted. In 1998, compensation for loss of income due to unfavourable natural conditions was paid for the first time and direct payments for cereal and dairy producers were also implemented (EMA, 1999). In 1999, the scope

of direct payments was extended to raising calves, sheep, small-scale livestock and swine breeding herds. Aid schemes for young farmers, the start-up of mutual loan associations and crop insurance were also established. After establishing the legal framework from 1996-1998, import duties were established for the first time in 1999, together with the import licensing of agricultural and food products. At the same time, the border control for agricultural and food products was improved and programmes for monitoring food quality were initiated (EMA, 1999). Another setback for Estonian agriculture was the fallout from the 1998 financial and economic crisis in the world, and particularly in Russia.

At the end of the 1990s, Estonian agricultural policy began to be shaped by the goal of EU accession. In 1995, Estonia ratified the Europe Agreement and accepted the politics, purposes and measures of the Community. In 1997, pre-accession negotiations began. The first action plan towards joining the EU was adopted in 1996. A more profound "third" action plan for EU accession was approved in 1998. That plan also covered the need to harmonise legislation and policies, as well as establish administrative capabilities. In 1999, the Phare Special Preparatory Programme was launched, which laid the groundwork for the implementation of the Special Accession Programme for Agriculture and Rural Development (SAPARD) (EMA, 1999).

2.4 Changes from 2001-2008

The third phase of transition and developments in agricultural policy encompasses the characterised processes and impacts of EU pre-accession and EU membership. From 2001-2004, SAPARD payments amounted to 67.9 million EUR and ¾ of all the programme funds were used for investments in agricultural holdings, as well as processing agricultural and fishery products. The programme had a considerable impact on the establishment of the administration for the implementation of the CAP. The programme also contributed to the reduction of several bottlenecks in Estonian agriculture and the food industry through investments (EMA, 2007).

In 2003, a national milk quota was established as a transition instrument prior to EU accession. Since accession in 2004, Estonia has applied the CAP with exceptions that

were made for new member states. The main differences from the EU-15 were that direct payments were implemented under the simplified area payments scheme (with gradually increasing subsidy levels) and the Rural Development Programme was only established for three years, i.e., 2004-2006. Market regulation mechanisms were implemented as in the EU-15. In 2007, the 2007-2013 Rural Development Programme was launched and by 2013 direct payment levels in EU-12 should reach the levels that the EU-15 member states had on 30th April 2004.

Since 2001, the upheaval in agricultural development can be associated with the implementation effects of programmes preceding EU accession (Lõo, 2005: 125). The opening of the EU market increased trade in all sectors of the economy. The growth of exports increased the demand for domestic raw materials, which had positive effects on producer prices and sales volume. However, the rising cost of agricultural raw materials and means of production resulted in increased production costs (UINT et al., 2005).

3. The performance of the agricultural sector during transition

3.1 Land use and arable production

During the reforms, agricultural land use declined significantly. From 1990-2008 the sown area of field crops declined by 322.9 thousand hectares (28.9%) (see table 3). The steepest decline occurred during the first sub-period (1990-1995). Of a total decrease in sown areas, the first 5-year period accounts for 82.3%. This period corresponds with the fundamental land, proprietorship and agricultural reforms and the disbandment of collective farms. As discussed in Section 2, the main reasons for excluding land from agricultural use relate to unclear landed property relations and the incapability and unwillingness of new landowners to begin agricultural production. At the same time, the steep decline in consumer demand, the loss of the export market to former USSR states and deteriorated terms of trade constituted a shock that led to a drastic decline in agricultural supply. From 1995-2001, the sown area declined by 12.8 thousand ha (1.5%) compared with 1995 and from 2001-2008 by 44.5 thousand ha (5.3%) compared to

Table 3. Sown area of field crops in 1990, 1995, 2001 and 2008

	1990, thousand ha	1995, thousand ha	Average annual change 1990-1995	2001, thousand ha	Average annual change 1995-2001	2008*, thousand ha	Average annual change 2001-2008
Cereals and legumes	397.1	308.0	-4.3%	277.8	-2.1%	313.9	1.8%
.. Barley	263.7	186.5	-5.9%	134.3	-6.8%	136.7	0.3%
.. Wheat	26.0	38.6	6.8%	59.6	9.1%	107.1	8.7%
.. Oats	33.4	38.5	2.4%	48.1	4.6%	34.3	-4.9%
.. Rye	65.9	32.0	-12.8%	20.9	-8.9%	21.4	0.3%
Industrial crops	3.2	7.3	14.7%	28.3	31.1%	78.5	15.7%
Vegetables and greens	5.2	4.6	-2.1%	3.3	-6.9%	2.4	-4.7%
Potatoes	45.5	36.9	-3.6%	22.1	-10.8%	8.7	-14.2%
Forage crops	665.3	493.9	-5.1%	506.4	0.5%	389.9	-3.8%
Total	1 116.3	850.7	-4.6%	837.9	-0.3%	793.4	-0.8%

* Data from 2008 is preliminary.

Source: SOE (1998, 2002, 2006)

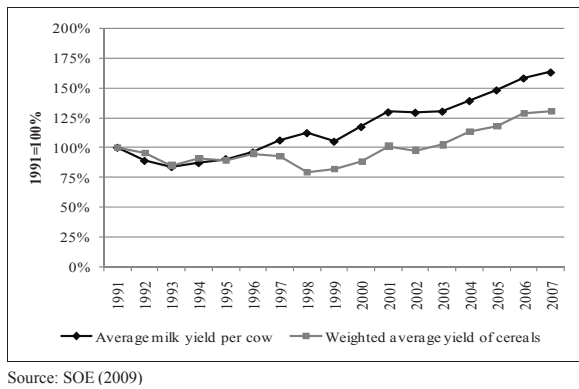
2001. However, the decline in agricultural land use should not only be associated with reforms. The abandonment of agricultural land has been more extensive in regions with low fertility soils (ASTOVER et al., 2006). Consequently, agricultural production from the lower fertility of previous collective farm soils was not competitive in the newly-introduced free market economy conditions.

During transition there have been changes in crop preferences, with potatoes declining the most (80.9%) (see table 3). A large decline has also taken place in vegetables and greens (53.8%), and forage crop production (41.4%). The decline in the area of cereals and legumes has been smaller than the average (21.0%). From 1990-2008, rapeseed has gained significant importance. The area of sown land for rapeseed has increased to 77.7 thousand ha, accounting for 9.8% of the total sown area (up from 0% in 1990).

The relative importance of certain cereal crops has also changed. The proportion of barley in the total sown area has decreased from 66.3% to 35.3% and the share of wheat has increased from 6.5% to 27.7%. An increase in the share of wheat can be explained by the average 14% premium in producer prices and 16% higher yields in comparison to barley (SOE, various issues). A decline in the relative importance of barley can also be explained by a decline in animal herds. Demand for barley as a feed grain has decreased significantly. Considering the transition from planned to market economy, we can also assume that the crop preferences prior to transition were not decided purely by economic reasoning.

A reduction in cereal production due to a decline in sown areas has been partly offset by increasing yields. The three-year weighted moving average yield of cereal crops was 2,633 hkg/ha in 2007, which is 30.7% higher than the corresponding figure in 1991 (see figure 1). However, the average yield from 1981-1985 was 26.1 kg/ha (see table 1), indicating a strong decline in cereal yields during transition. The three-year average cereal production in 2007 accounted for 94.6% of the 1991 level, suggesting that cereal production is approaching its pre-transition volume. Production figures were lowest in 1998, accounting for 65.3% of 1991 production levels. From 1998 onwards, yields have been increasing at a 5.7% per annum average. Improving produc-

Figure 1. Milk and cereals yield dynamics in 1991-2007



Source: SOE (2009)

tivity can partly be associated with direct payments introduced from 1998. Farmers had more funds to buy inputs (fertilisers and pesticides) for arable production. After EU accession (2003-2007), average yields have increased by 27.6% (6.3% per annum). A higher rate of yield increases since EU accession could be associated yet again with higher direct payments, which have enabled farmers to use more and better quality inputs. Also, land use relations are more defined, with 84% of the land registered in cadastre. Investment aid schemes applied since 2001 have allowed farmers to invest significantly (compared to 1990-2001) in up-to-date technology.

3.2 Animal production

In the USSR, Estonia was specialised in animal and dairy production. After the collapse of the USSR, animal production fell proportionately more than arable production (see table 4). From 1990-1995 the number of sheep and goats declined by 64.4%. The decline in dairy herds has been more steady compared to other herd classes. From 1990-1995 the number of dairy cows decreased by 34.0% (8.6% per annum). The average annual decline was steepest from 1990-1995. Between 2001 and 2008 one can see signs of recovery in pig, sheep and goat herds. The size of the pig herd increased by 5.5% (0.8% per annum), while sheep and goat herds have increased by 159.3% (12.7% per annum). An increase in sheep and goat herds could partly be explained by the establishment of direct payments for raising sheep and goats from 1999, but also by the low starting point in 1998.

Table 4. Size of animal herds in 1990, 1995, 2001 and 2008

	1990, thousands	1995, thousands	Average annual change, 1990-1995	2001, thousands	Average annual change, 1995-2001	2008*, thousands	Average annual change, 2001-2008
Cattle	757.8	370.4	-15.4%	260.5	-6.0%	238.2	-1.3%
Dairy cows	280.7	185.4	-8.6%	128.6	-6.3%	100.5	-3.6%
Pigs	859.9	448.8	-13.9%	345	-4.5%	364.0	0.8%
Sheep and goats	139.8	49.8	-22.9%	32.4	-7.4%	84.0	12.7%
Poultry	6 536.5	2 911.3	-17.6%	2 294.9	-4.0%	1 743.3	-4.0%

* Data from 2008 is preliminary.

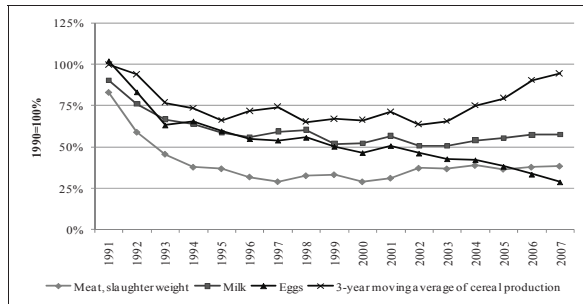
Source: SOE (1998, 2002, 2006)

In livestock production, there has not been a recovery similar in volume to that of cereal production (see figure 2). In 1991, 1,092.8 thousand tonnes of milk were produced. In 2007, the production volume accounted for just 57.3% of 1991 levels. There has been a slight increase in meat production since 2000 but in 2007 meat production accounted for 38.6% of the 1991 level. Egg production is still declining, and 2007 production accounted for 28.8% of the 1991 production level.

establishment of private farms began in 1989. By the end of 1989, 828 private farms were established with an average area of 25 ha (see table 5) (VIRMA, 2004).

From 1989-2000 the number of private farms increased rapidly. The number of agricultural enterprises increased from 1990-1993 mainly due to privatisation and the break up of collective farms. From 1993-1999, the number of agricultural enterprises was declining due to the liquidation of non-competitive agricultural enterprises (former collective farms). From 2000-2007, the number of legal persons in the agricultural sector increased. These were mainly private farms reorganised as private limited companies (limited liability instead of full liability of the owner in the case of natural persons). From 2000-2007 there was a sharp decline in the number of farms owned by natural persons, but this is mainly due to how farms are registered. Natural persons initially registered as farms have unregistered themselves because they are not selling agricultural produce. According to SOE, there were 7,302 agricultural producer holdings whose economic size was at least 2 ESU (European Size Units) in 2007. With reservations, these holdings could be counted as acting

Figure 2. Changes in animal and cereal production in 1990-2007, 1990=100%



Source: SOE (2009)

On the other hand, productivity has increased more in livestock than in crop production. The average yield of dairy cows has steadily increased since 1993 (see figure 1). From 1991-1993 there was a 16.3% decline in average milk yield. From 1993-2007, the average yield of dairy cows increased by 95.2% at an average annual rate of 4.9%. In 2007, the average milk yield was 6,484 kg/cow (SOE), while the EU average was 6,013 kg/cow (FAOSTAT, 2009).

3.3 Structural changes

Breaking up the collective farms caused a shock in Estonian farming structures. Resources and production facilities that had been previously concentrated in large holdings were now scattered among relatively small private farms. The

commercial farmers in Estonia.

Farms established from 1989-1992 received support from the government and collective farms in the form of subsidised inputs and services (ALANEN, 2004; OECD, 1996). This encouraged people to establish small family farms and also stimulated naïve expectations about the viability of small farms in the market economy (TAMM, 2001: 415). KELAM (1993: 39) shows that the main motives for establishing farms were the possibility of working according to one's desire and the wish to return to a traditional lifestyle. New farmers were optimistic about the future and considered the economic situation favourable. However, by 1992, the economic situation of farmers had considerably worsened (KELAM, 1993: 44).

Table 5. Number of collective farms, agricultural enterprises, private farms, natural persons and legal persons*

Year	Collective farms		Agricultural enterprises	Private farms		Natural persons		Legal persons	
	Number	Average area, ha	Number	Number	Average area, ha	Number	Average area, ha	Number	Average area, ha
1985	302	8 369		17	0				
1989	326	7 628		828	25				
1991			396	7 029	25				
1993			1 013	10 153	25				
1995			873	19 767	21				
1997			803	34 671	22				
1999			680	51 081	21				
2001						54 895	9.9	853	384.3
2003						36 076	12.9	783	419.8
2005						26 868	17.2	879	418.0
2007						21 889	21.5	1 447	302.1

* Until 2001, the official statistical units were agricultural enterprises and private farms. Since 2001, the official statistics use concepts of agricultural holdings, which are classified into natural persons and legal persons.

Sources: VIRMA (2004); SOE (1999); SOE (2009)

Table 6. The structure of dairy herds 1990-2008

	Herd size classes, number of dairy cows per herd							
	1...10	11...50	51...100	101...300	301...600	601...900	901...1,200	>1,200
1990				24	107	114	54	34
1992				99	158	83	27	16
1993	2 815	291	161	342	120	27	6	5
1995	2 128	291	127	278	74	14	5	3
1999	1 832	682	116	188	60	12	4	3
2003	1 727	637	103	164	60	13	4	4
2007	489	465	100	135	63	17	4	3

Source: EARC (2009)

The structural break in the dairy sector is perhaps more pronounced than in farming in general. Until 1993, there were no farms with less than 101 cows and production was concentrated in large holdings (see table 6). In 1993 the situation changed drastically – there were 2,815 herds with less than 11 cows and there was a large decline in the number of larger dairy herds. However, since 1995, the number of herds in size classes 601-900, 901-1200, and over 1200 cows has been relatively stable, indicating that these are mainly former collective farms that were privatised and did not collapse during transition. On the other hand, since 2000 there has been a rapid decline in herds with between 1-10 and 11-50 dairy cows. Therefore, it is evident that the structural break at the beginning of the 1990s created a number of small farms, and during transition a vast majority of the small dairy farms were not viable.

The average annual wage in Estonia was 8,700 Euros in 2007. In the agricultural sector, the average annual wage was 6,600 Euros (SOE, 2009). If average wages are compared to family farm incomes in 2007 (see table 7), it is evident that farms of less than 40 ha do not provide sufficient income for farm families. There is a positive correlation between farm size and farm net value added per hectare and per annual working unit.

3.4 Trade patterns

During transition, Estonia maintained its position as a net exporter of dairy products and live animals (see figure 3). At the same time, Estonia has become a net importer of meat products. Since EU accession, the net export of dairy products and live animals has increased, indicating the positive effects of accession. At the same time, the net import of meat has also increased, indicating lower competitiveness in the meat sector compared to the dairy sector.

With regard to plant products, Estonia has been a net importer of fruits and vegetables. As purchasing power has increased, the net import balance has also increased steadily (see figure 4). An increase in cereals and oilseed production since EU accession has led Estonia to become a net exporter of cereals and oilseeds from 2005-2008.

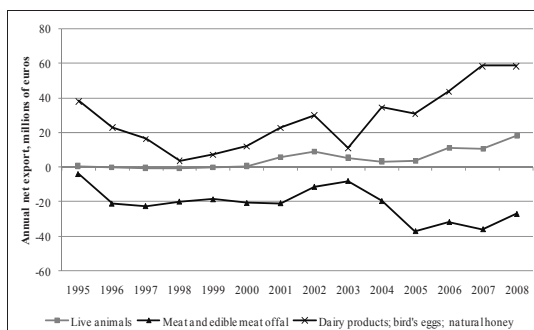
Table 7. Income of farms by size classes and farm types in 2007

	Farm size class, ha			
	0-40	40.01-100	100.01-400	400.01-...
	Farm net value added per AWU			
.. arable holdings	5 012	6 865	30 173	46 775
.. dairy holdings	3 366	7 762	13 509	15 066
.. mixed holdings	3 302	5 541	17 214	20 395
	Farm net value added per ha			
.. arable holdings	261	183	284	314
.. dairy holdings	188	207	322	412
.. mixed holdings	240	144	228	372
	Family farm income			
.. arable holdings	6 466	9 410	49 922	177 654
.. dairy holdings	5 200	11 858	41 625	140 485
.. mixed holdings	4 515	8 116	34 265	227 137

Source: EMA (2008)

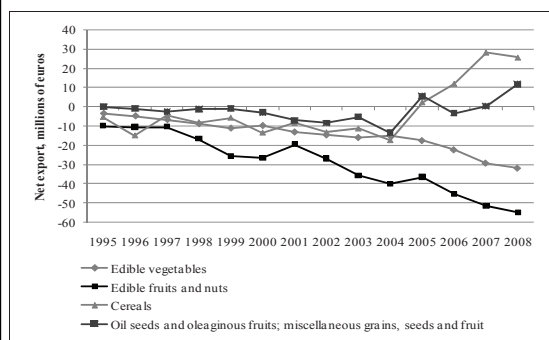
During transition, Estonia's main trading partners for agricultural produce have also changed. At the beginning of the 1990s, the Russian Federation continued to be an important export market. However, trade between Estonia and the Russian Federation has always been strongly influenced by political tensions. Therefore, the importance of the Russian Federation as an export market fell dramatically between 1995-2003, and trading with the EU increased markedly,

Figure 3. Net export of animal products (Section I of HS), 1995-2008, millions of Euros



Source: SOE (2009)

Figure 4. Net export of plant products (Section II of HS), 1995-2008, millions of Euros



Source: SOE (2009)

with The Netherlands leading the way. EU accession reopened the Russian Federation as a market for Estonian producers. Since accession, exports have been directed away from The Netherlands and towards the Russian Federation (see table 8). There has also been a visible increase in the importance of the Scandinavian and Baltic countries as export markets. Indeed, almost $\frac{2}{3}$ of Estonian agricultural produce exports go to neighbouring countries' markets.

The importance of the Russian Federation for the import of agricultural produce has also decreased significantly. With regard to imports, integration with the Baltic and Scandinavian markets is evident. Germany and the Netherlands have been significant import countries throughout transition.

Table 8. The main trading partners of agricultural commodities (HS Sections I and II) in 1995, 1999, 2003 and 2008, % of trade volumes

	1995	1999	2003	2008
Share in exports, %				
The Netherlands	27.2	19.0	21.7	5.8
Russian Federation	23.4	9.6	4.8	12.2
Baltic countries	7.4	25.3	25.3	25.8
Scandinavian countries	11.4	15.3	14.3	26.3
Germany	3.3	5.6	11.7	8.0
Share in imports, %				
The Netherlands	15.2	15.0	15.3	12.5
Russian Federation	9.0	6.6	5.2	1.1
Baltic countries	7.5	9.3	16.9	21.8
Scandinavian countries	36.9	36.6	24.8	32.3
Germany	7.3	8.5	4.9	7.8

Source: SOE (2009)

4. Conclusion

Based on the information regarding institutional reforms and production statistics, three sub-periods can be outlined within the 20 years of Estonian transition. From 1988-1995 land, property, and agricultural reforms were implemented to form the new structure of agricultural production based

on private farms and privatised agricultural enterprises. The ideological goal of these reforms was to return to the structure of small family farms that prevailed before World War II. In reality, the majority of re-established farms proved to be nonviable and ill-equipped for the realities of the liberal market economy. In addition, the liberal trade policy gave a competitive advantage to subsidised imports from the EU. The fundamental changes were accompanied by a dramatic decline in the sown area of field crops and the volume of agricultural production.

The idealisation of family farming could be cited as a hindrance that led to the separation of most of the collective farms (IVASK, 1997). The primary carrier of the ideologically rigid family farm project was the narrow stratum of nationalist intellectuals and new government functionaries with an urban background. The ideology had a great effect on the policies of the government, although the prospects of agricultural production itself took a drastic turn for the worse immediately after the Baltic republics had reinstated their independence in 1991 (ALANEN, 1999: 433).

The Estonian agricultural decline in the 1990s manifested itself in the widespread neglect of arable land; the great problems faced by post-reform agricultural enterprises, including numerous closures and bankruptcies; and the impoverishment of farmers and the rural population (ALANEN, 1999; ALANEN et al., 2001; ALANEN, 2004; UNWIN, 1998; SIRENDI, 2009). Slow land reform and incoherent property relations, the unwillingness and incapability of new farmers to manage farms, and the uneconomic land use of previous collective farms were the main reasons behind the neglect of arable land. Agriculture could not offer enough employment or primary income to the majority of producers (LÖÖ, 2005).

From 1995-2001, the decline in production began to level out, the number of privatised agricultural enterprises declined and the number of private farms increased. However, many of the private farms are just households where some production for family purposes is maintained. During this period, agricultural policy became more relevant to the political agenda and the first support schemes for agricultural producers were implemented. Due to limited resources in the governmental budget, these mechanisms did not have particularly significant effects on agricultural growth. In 1996, Estonia set the goal of attaining EU membership. Therefore, the harmonisation of Estonia's institutional basis with EU institutions was initiated.

In 2001, the first positive effects of the impending EU accession could be detected. The harmonisation of institutions and law with the CAP has contributed to more systemic agricultural policy in Estonia. Implementing the SAPARD pre-accession programme considerably improved the deficit of investments that emerged in the 1990s. Since EU accession, trading activity has significantly increased. Cereal production has increased since 2005 and is approaching the level of 1990. This has led to the net export of cereals and oilseeds in 2005-2008.

As the application of the CAP in the EU-12 and EU-15 is somewhat different and will remain so until 2013, it is evident that the transition and harmonisation of institutional settings in agriculture and the adaptation of EU-12 agricultural sectors with the EU common market will continue during the next EU budget period of 2014-2020. In the EU-12, one of the key questions is whether a new generation of farmers will emerge to take over the farms established in the beginning of 1990s, as the founders of these farms will reach retirement age in the coming decade.

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ORIGINAL PUBLICATIONS

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The Determinants of Farm Growth, Decline and Exit in Estonia

Die bestimmenden Faktoren für die Vergrößerung, den Rückgang der Größe und den Ausstieg der landwirtschaftlichen Betriebe

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Abstract

The process of structural changes in Estonian agriculture is influenced by both socioeconomic factors that are similar in other western countries and transition-related factors. This current paper aims to investigate the effects of such socioeconomic factors on the probabilities of farm growth, decline and exit relative to retaining the previous farm size. The survey and agricultural registers' data are used for multinomial logit estimation. The results indicate that the farm growth probability is highest in the 40-49 year age group. The availability of successors significantly reduced farm exit probability, and the level of education of the farm operator increased the farm growth probability. While off-farm work was more probable in smaller farms and in cases of more educated and younger farm managers, it was evident that the off-farm employment of the farm operator significantly increased the probability of farm exit. While the larger farms have a higher probability of remaining in business, and lower probability to exit or decline, they do not have higher growth probability. Participation in a semi-subsistence farming scheme reduces the exit probability. It has been shown that farms founded during the beginning of transition due to restitution have lower decline and growth probabilities, indicating that such farmers are emotionally more inclined to maintain the farms of their forefathers.

Key words

structural changes; farm exits; farm growth; economic transition; semi-subsistence farming; Estonian agriculture

Zusammenfassung

Der Prozess der strukturellen Veränderungen in der estnischen Landwirtschaft wird von sozioökonomischen Faktoren, die ähnlich in anderen westlichen Ländern sind, sowie von mit dem Übergang verbundenen landesspezifischen Faktoren beeinflusst. Im diesem Artikel werden die Auswirkungen solcher sozio-

ökonomischen Faktoren auf die Wahrscheinlichkeit des Wachstums, Rückgang der Größe und Ausstieg der landwirtschaftlichen Betriebe untersucht, im Vergleich zu der Lage, wenn die Größe sich nicht ändert. Für die Multinomialen Logit-Modelle werden Daten aus den Umfragedaten und Daten aus dem Landwirtschaftsregister verwendet. Die Ergebnisse zeigen, dass die Wahrscheinlichkeit des Wirtschaftswachstums eines Betriebes am höchsten ist, wenn der Betreiber zwischen 40 und 49 Jahre alt ist. Die Existenz von Nachfolgern hat eine negative Wirkung auf den Ausstieg. Das Ausbildungsniveau des Betreibers erhöht die Wahrscheinlichkeit des Wirtschaftswachstums des Betriebes. Es ist offensichtlich, dass die Beschäftigungsmöglichkeiten des Betreibers außerhalb des Landwirtschaftsbereichs die Wahrscheinlichkeit des Ausstiegs erhöhen. Während die größeren Betriebe deutlich seltener aussteigen oder ihre wirtschaftliche Größe zurückgeht, ist ihre Wachstumswahrscheinlichkeit auch nicht größer. Zur gleichen Zeit senkt die Teilnahme an einem Semi-Subsistenzbetriebe-Schema die Ausstiegswahrscheinlichkeit von Betrieben.

Schlüsselwörter

strukturelle Änderungen; Ausstieg der landwirtschaftlichen Betriebe; Wachstum der Betriebe; wirtschaftlicher Übergang; Semi-Subsistenzbetriebe Schema; estnische Landwirtschaft

1 Introduction

Expansion, contraction and exit are the farm development phases often associated to the farm family life cycle, which comprises of the entry, growth, maturity, decline, and exit stages. In the exit phase, the farm is handed over to the next generation or liquidated (BOEHLJE, 1973; POTTER and LOBLEY, 1992, 1996; LOBLEY et al., 2010). In Western countries, the number of farms is largely decreasing, implying that the remaining farms, on average, increase in size (GALE, 2003).

In the last 100 years, three structural breaks have occurred in Estonian agriculture, influencing both farm ownership and size structure. The first structural break occurred in 1918 when the Republic of Estonia was founded. At the time, 58% of the total land belonged to about 1,000 manors of the nobility, with the average holding being 2,114 ha. The rest of the land was operated by 51,600 farms with an average size of 34 ha. In 1920-30s, the manor lands were nationalised and new farmsteads were parcelled out. These reforms contributed to the creation of a new social order, in which the equitable distribution and individual control of property occupied a pivotal role. The stated aim of the spatial reconfiguration was to promote an egalitarian society and to encourage entrepreneurial individualism, as well as to bond citizens to the state and its cherished republican ideal, rather than to customary communal institutions. Therefore, the spatial reconfiguration of land rights was an important way of communicating egalitarian ideals and integrating the national territory (MAANDI, 2010). By 1939, the number of farms was 140,000 with an average size of 23 ha (PIHLAMÄGI, 2004).

The second structural break, collectivisation, began with the Soviet occupation in 1940. The main part of collectivisation occurred in 1949-1952, during which the land, assets and animals of the last private farms were collectivised. The restructuring of collective farms continued throughout the occupation: in 1949, there were about 9,000 collective farms; 326 collective and state farms with average area of 7,628 ha remained by 1989 (UNWIN, 1997).

The third structural break began at the end of the 1980s with establishment of private farms on the marginal land of collective farms. In 1989, aside from the collective farms, there were 828 private farms with average area of 25 ha. The first reforms and changes carried out during the years leading to the collapse of the Soviet Union culminated in the transition from socialist collectivised agriculture to market-based private farming after Estonia regained its independence. In 1991, the restitution of land to its pre-collectivisation owners and the privatisation of collective farms began (VIIRA et al., 2009a).

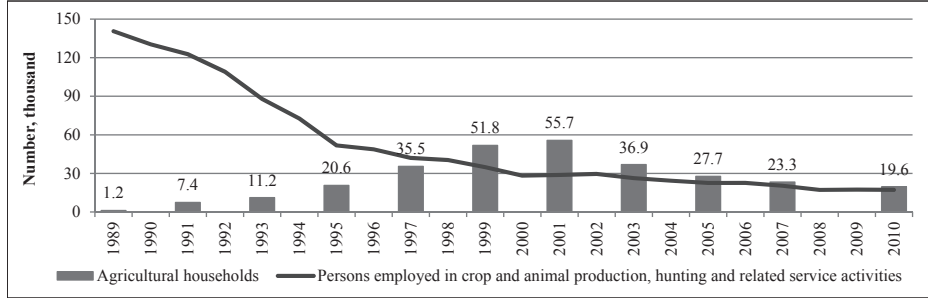
Since the continuity of the ownership was considered important, in part, the land, agricultural and ownership reforms of the 1990s followed the same ideological goals of the land reforms in the 1920s (CSAKI and LERMAN, 1994). In the political debate, the pre-Second World War family farms were presented as the ideal and natural way of agrarian structure in which the rightful owners of the land could use their

property as they saw fit, as opposed to forced the collectivisation and industrialisation of Soviet agriculture in which the workers of collective farms had little property and no real interest in the fruits of their labour. The prevailing notion was that Estonian families would return to their rural roots in large numbers, creating family farms that would provide sustenance to the majority of the rural population, create strong families and rural communities.

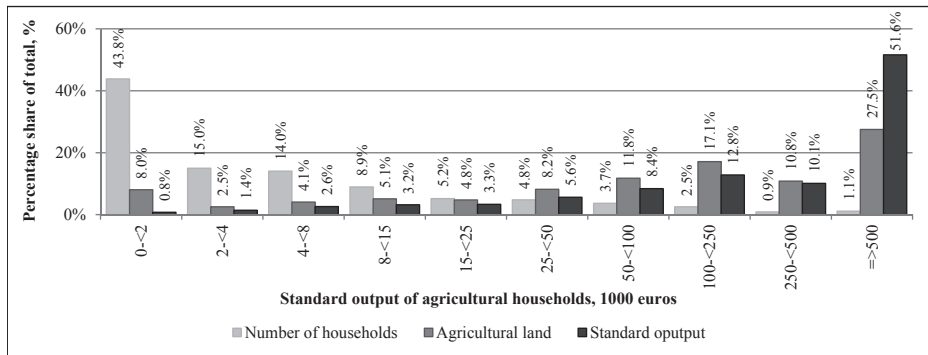
In the case of CEEC land reforms, distributional effects involved two separate and sometimes conflicting issues: 1) the legal ('historical justice') demands of pre-collectivisation landowners whose land was confiscated by communist regimes or who were forced to participate in the collectivisation, and 2) social equity concerns (SWINNEN, 1999). In Estonia, the latter was addressed by allowing the opportunity to privatise land by pre-emptive rights (for people whose buildings were located on land subject to privatisation) or on general grounds (for rural inhabitants in the vicinity of their homes) (EMA, 2002). During the agricultural reform, a local reform committee in each collective farm decided how the farm's assets would be distributed for compensation to pre-war owners, privatisation or sale. From the economic point of view, the idealisation of family farming could be cited as a hindrance that led to the separation of many of the functioning collective farms and the creation of many private farms that became unviable (IVASK, 1997).

In the euphoria of the moves towards independence, it was estimated that there would be 40,000-60,000 private farms in Estonia by 2000 (UNWIN, 1997). This proved true as the number of agricultural households¹ increased to 55.7 thousand by 2001, with

¹ Due to the fact that the definitions of agricultural holdings have changed several times in 1989-2010, we have used agricultural household as a synonym of farm. Here, household plots are not accounted as agricultural households. In 1989 collective farms and private farms are considered as agricultural households. From 1991-1999 agricultural enterprises and private farms were considered as agricultural households. Agricultural enterprise was defined as a legal person whose main activity according to the Estonian Business Register is agriculture. Private farm was defined as a holding with more than 1 ha of agricultural or forest land (STATISTICS ESTONIA, 2002). Since 2001 agricultural holdings were considered as agricultural households. Agricultural holding is defined as a single unit both technically and economically, which has single management and which produces agricultural products or maintains its land which is no longer used for production purposes in good agricultural and

Figure 1. Number of agricultural households and agricultural employment in Estonia in 1989-2010

Source: STATISTICS ESTONIA (2012)

Figure 2. Distribution of agricultural households, agricultural land and standard output in Estonia in 2010

Source: STATISTICS ESTONIA (2012)

an average of 16 ha of agricultural land per household (Figure 1). Agrarian restructuring and the creation of private farms led to a situation where, in 2001, the number of people employed in agriculture, hunting and related service activities was 28.8 thousand, while the number of agricultural households was two times higher. Evidently, many of the 55.7 thousand agricultural households were unable to provide full-time employment for at least one household member. By 2010, compared to 2001, the number of agricultural households had decreased by 64.8% to 19,600 with an average of 48 ha of agricultural land each, and agri-

cultural employment had decreased to 17.2 thousand persons.

However, the size distribution of agricultural households remains skewed: in 43.8% of the households, the standard output (SO) was less than 2,000 euros in 2010². These households managed 8.0% of agricultural land and produced 0.8% of the total SO (Figure 2). At the same time, in 1.1% of the house-

environmental condition, where there is at least 1 ha of utilised agricultural land, or there is less than 1 ha of utilised agricultural land but agricultural products are produced mainly for sale. Units where agricultural products are not produced but only land is maintained in good agricultural and environmental condition are included from 2007 (STATISTICS ESTONIA, 2012).

² In the agricultural census, economic size of agricultural households is estimated. From 2010 economic size of the holding is measured as standard output of the holding. Standard output is defined as the monetary value of gross agricultural production at farm-gate price corresponding to the average situation in a given region which is calculated on the basis of crop area, number of livestock and standard output coefficients. Standard output does not include VAT, other taxes on products and direct payments (STATISTICS ESTONIA, 2012; COMMISSION REGULATION (EC) No 1242/2008).

holds SO was at least 500,000 euros. This 1.1% of households managed 27.5% of agricultural land and produced 51.6% of the total SO. In 2011, 946 thousand ha of agricultural land was utilised in Estonia. In 1991, the utilised agricultural area was 1,375 thousand ha and the area of arable land was 1,116 ha, implying that approximately 200-400 thousand ha of agricultural land has been left idle in transition. In 2011, the share of the agricultural sector in value added was 3.6% and in employment 3.2%. The value of Estonian agricultural output was 810.6 million euros in 2011, of which arable products comprised 41.5% (cereals 15.5%, oilseeds 7.7%, fodder 7.9%) and animal products 47.8% (milk 26.0%, pork, 10.7%, cattle excl. milk 5.3%) (STATISTICS ESTONIA, 2012).

Therefore, due to the context of transition, the development of Estonian farm structures in the past 25 years differs from the traditional development of the family farm based structure in western countries, as described by e.g. TAYLOR et al. (1998), PESQUIN (1999), ERRINGTON (2002), CALUS et al. (2008). In the beginning of the period, the number of farms increased rapidly due to the processes of transition, restitution and privatisation, while the relative uncertainties about the stability of economic conditions coupled with the fast development of other economic sectors have contributed to the decline in the number of farms (VIIRA et al., 2009a). Since the newly established farms were not taken over from the preceding generation, this process cannot be characterised as smooth intra-family farm successions. Growing up on a farm and socialisation within a farm family are regarded as specific investments in human and social capital, which can be seen as a transaction specific investment and the accumulation of attitudes and skills that are adjusted to the specifics of decision making in individual family farm units (HUFFMANN, 1977; PESQUIN et al., 1999; GLAUBEN et al., 2004b). As a large proportion of farms were returned to the heirs of the pre-war owners, many new owners lacked the human and financial capital necessary for managing an individual farm. HEDIN (2005) found that non-monetary values like the desire to recover family property and the sense of duty towards ancestors were important factors for new landowners, and in many cases economic motives for the recovery of land were of minor importance.

The decrease in the number of farms and the increase in average farm size from 2001 to 2010 imply that farm growth, decline or exit could be observed in many cases. In Estonia, the rapid decline in the number of farms has raised questions if the chosen paths

of agricultural and ownership reforms were correct, and if the agricultural policy has been preferential for larger farms. Taking into account the context of changes since 1991-2010, we assume that in addition to economic and socioeconomic factors, farm growth, decline and exits have also been affected by transition-specific factors, such as in the way the farm was established (e.g. restitution of pre-war farm, privatisation of part of collective farm etc.) or participation in semi-subsistence farming schemes in new EU member states. Given the large decrease in the number of agricultural households, we expect that a large portion of the households that have exited the agricultural sector were restituted farms. However, in recent years, the decline in the number of farms has slowed down (Figure 1). Hence, one generation after the beginning of the transition, it is intriguing to study if the process of structural changes is driven by similar factors as in other western countries or still exhibits the characteristics of post-communist transition.

Therefore, the aim of this paper is to study the effects of various farmer- and farm-specific characteristics on the probability of farm growth, decline and exits relative to retaining the previous farm size. The factors under consideration are: the age of the farm operator, farm size measured by the value of the farm's standard output, off-farm employment status of the farm operator, farm operator's evaluation on the availability of successors, and his/her level of formal education. Also, the effects of the farm specialisation (grazing livestock), the way the farm was established (restitution), and participation in semi-subsistence farming scheme are analysed. We use multinomial logit regression and farm survey data from 2007 and 2011, which is combined with the 2006 and 2010 data from the national paying agency's registries about land use, animal stock and farm payments.

2 Factors that Affect Farm Growth, Decline and Exit

BOEHLJE (1990) categorises five models of structural change: the technology, human capital, financial, institutional, and sociological (family farm) model. In our analysis, we mainly draw on the sociological and human capital models, as these are closely related to the family farm life cycle and farm family characteristics.

Numerous studies suggest that the age of the farm operator is one of the main factors in farm

growth and survival (WEISS, 1999; VÄRE, 2006; PEERLINGS and OOMS, 2008; SCHNICKE et al., 2008). In the entry stage, the farm operator has to acquire a “critical mass” of managerial ability and the capital necessary for growth. In the exit stage, the farm operator is interested in reducing his/her commitment (BOEHLJE, 1990). This implies that farm growth is less likely in the younger and older age groups of farm operators. In addition, the effect of age is interrelated with the availability of successors. If the farm is transferred within the family, its viability is optimised prior to succession. In the case of farm exit, liquidation value is optimised. The succession effect plays a role from the age of 45 and the early designation of the successor motivates the farmer to invest and improve the management of the farm (GLAUBEN et al., 2002; CALUS and VAN HUYLENBROECK, 2008; CALUS et al., 2008; VÄRE, 2006).

Human capital, i.e. level of education, managerial ability, experience and skills, has been noted as an important factor in farm growth. Managerial input is also critical to the cost and production relationships of a farm. If managerial capacity is a fixed factor, then costs will eventually rise with increased farm size, since higher levels of output receive less and less managerial input (BOEHLJE, 1990).

RIZOV (2003) has suggested that the analytical background of JOVANOVIC’s (1982) model, in which individuals are unsure of their abilities when they enter business but uncover their true efficiencies over time, is appropriate to explain the farm-sector transformation in former communist countries as many individuals established private farms without knowing if they have what it took to become an entrepreneur. In the study of the role of human capital in the decisions of rural households regarding the selection of the farming mode (cooperative, full-time individual farm, part-time individual farm, hybrid, or absentee landowner) in Romania, RIZOV (2005) found that, while the farm type selection process was complicated by the factor of market imperfections characterising transition, households with a higher level of human capital (education, broader work experience) were more likely to opt for either full- or part-time individual farming, or selected absentee landowner type and rented out land, while deriving income from off-farm work. Therefore, higher human capital can be associated with the more effective management of individual farms and better opportunities in the off-farm labour market. Households with lower human capital were more likely to select a cooperative type of farming.

Also, it has been argued that human capital may increase the earning capacity of a farm operator in the non-farm economy, therefore reducing the probability of farm survival if the farm operator chooses to dedicate 100% of his/her labour input outside the farm (WEISS, 1999); or increasing the probability of farm survival if only part of the labour input is used off-farm, and the off-farm income complements earnings from agricultural production (BREUSTEDT and GLAUBEN, 2007; BOEHLJE, 1990). Off-farm employment has more of an impact on the farming sector in areas where there are more non-farm employment opportunities (BOEHLJE, 1990), and also in the younger age group of farmers who can benefit more from the change in their careers due to the longer time horizon (RIZOV and MATHIJS, 2003).

Gibrat’s Law implies that farm growth is independent of the initial farm size. However, WEISS (1999) shows that smaller farms grow relatively faster than larger farms. Several studies have reported a negative relationship between farm size and farm exits. More land makes it easier to overcome borrowing constraints and therefore reduces development restrictions and increases succession probability (GLAUBEN et al., 2004a; BREUSTEDT and GLAUBEN, 2007). According to the financial model of structural changes, agricultural land is one of the main production factors that determine farm income. Simultaneously, land constitutes a major part of farm capital. If capital gains from land are foreseen, the farmer is expected to obtain more agricultural land to increase the farm’s future value (BOEHLJE, 1990). In Estonia, the average level of direct payments per ha of agricultural land is one of the lowest in the EU; however, the payments have been increasing since 2004 and are expected to converge towards average EU levels in the future (EUROPEAN COMMISSION, 2011). Therefore, in Estonia, the expected future capital gains from agricultural land have been and will continue to be a strong motivator for farm expansions.

The technology model of structural changes mainly deals with the adaptation of technology and scale economies. Primarily, the interest lies in the long-run cost curve and factors that affect the curve, among which agricultural policy is often of interest (BOEHLJE, 1990). In this paper, we analyse the effects of the semi-subsistence farming scheme on farm growth, decline and exit probabilities. Subsistence farming is often associated with rural poverty, or lifestyle and consumption preferences. Semi-subsistence farms normally produce for their own needs but also

sell to local markets. The semi-subsistence farming measure was a transitional measure for supporting semi-subsistence farms in the new EU member states that were undergoing restructuring (DAVIDOVA et al., 2009). The semi-subsistence farming scheme was one of the payment schemes in the 2004-2006 Estonian Rural Development Plan. Participation in the scheme provided farmers with an annual flat rate payment of 1,000 euros for five years. The aim of the scheme was to maintain smaller agricultural holdings and enhance their survival. Farmers were obliged to continue with agricultural activities for five years and increase the revenues from agricultural production (EMA, 2005).

In addition to the semi-subsistence farming payment, semi-subsistence farms were eligible also for single area payment, other types of direct payments and rural development support measures. In 2006, 16.1% of all the recipients of farm subsidies in Estonia received semi-subsistence payments. Of the 3,217 semi-subsistence farms 16.3% received only semi-subsistence payment and 83.7% received also other farm payments. The average area of these semi-subsistence farms that received other farm payments was 36.9 ha, and average SO 15,173 euros, their average level of all farm payments was 205 euro/ha and farm payments comprised 56% of their total SO. In case of the farms that did not receive semi-subsistence payments, the average area was 47.8 ha, the average SO was 24,548, the average level of all farm payments was 95 euro/ha and farm payments comprised 37% of their total SO. Therefore, the semi-subsistence farms had considerably higher average level of subsidies. However, the uptake of the measure in Estonia was lower than in other new EU member states. One of the reasons for relatively low participation was the requirement to continue agricultural activities in the next 5 years. Given the rapid decline in the number of agricultural households in Estonia between 2003 and 2010 (Figure 1), it is likely that those agricultural households that were unsure about continuation of farming, did not sign the contract for the next 5 years.

Farm survival is also influenced by the type of activities undertaken. A high share of animal production indicates relatively high sunk costs in closing down the farm. BREUSTEDT and GLAUBEN (2007) found that in regions specialised in livestock production the loss in the number of farms was significantly smaller. In our sample, specialist grazing livestock (in the following we use 'grazing livestock' for abbreviation of this farm type) was the most frequent farm type (Table 2). In this farm type, the SO of grazing livestock (i.e. equidae, all types of cattle, sheep and

goats) and forage for grazing livestock constitute more than 2/3 of farm SO (COMMISSION REGULATION (EC) NO 1242/2008). Substantial structural changes have occurred in this farm type in recent years in Estonia. In 2004, there were 2,146 milk quota owners in Estonia; in 2012, 918 quota owners remained. Hence, in 8 years, 57.2% of the milk producers had quit milk production (ARIB, 2005). Also, in 2006-2010, the number of grazing livestock farms in the registries of the paying agency decreased by 5.3%, while the total number of farms in the registries declined 2.9%. Therefore, it was analysed whether specialising in grazing livestock had an effect on farm growth, decline and exit probabilities.

3 Data and Method

The data was obtained from two farm surveys conducted in December 2007 and March 2011. The survey of 2007 aimed to investigate the perspectives and intentions of Estonian agricultural producers in the upcoming three years (2008-2010) (VIIRA et al., 2009b). The questionnaire was posted to a random sample of 1,000 farmers from the population of 6,724 farms whose economic size exceeded 2 ESU in 2005. In total, 290 questionnaires were returned (response rate 29%). In 2011, the survey was repeated among the respondents of the previous survey. Of the 290 posted questionnaires, 228 were returned (response rate 78.6%). The structure of the questionnaire was similar to that used in 2007. In addition, farmers were asked if they had quit agricultural production in 2008-2010. Since all of the respondents did not answer all the questions, data from 196 respondents is used in the present analysis.

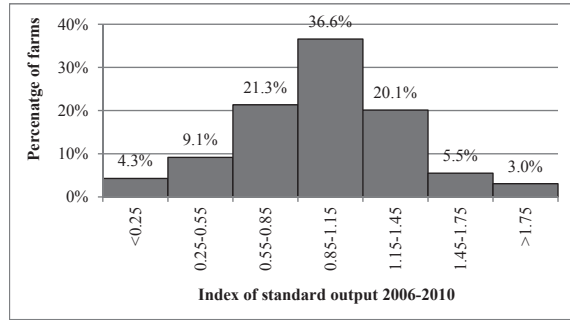
The survey data was complemented with data from the registries of the paying agency (ARIB – Estonian Agricultural Registers and Information Board) regarding land use, crops, agricultural animals, and participation in payment schemes. Based on the registry data of 2006 and 2010, SO as defined in the COMMISSION REGULATION (EC) NO 1242/2008 were calculated for each farm, based on Estonian SO coefficients used in 2011 (RURAL ECONOMY RESEARCH CENTRE, 2012). The derived SO of 2006 and 2010 were used in order to measure the economic size of the farms in 2006, and estimate changes in the farm's economic size between 2006 and 2010. Among those 164 farms that did not quit agricultural production between 2006 and 2010, the average SO in 2006 was 71,034 euros, and 80,305 euros in 2010. This indicates

that the average economic size of the remaining farms increased by 13.1%. In 2006, the average SO of those farms that quit agricultural production between 2006 and 2010 was 11,836 euros.

Previous studies have investigated the effects of various determinants on the probability of farm growth or decline based on stated intentions (BARTOLINI and VIAGGI, 2012), or on empirical growth rates (RIZOV and MATHIJS, 2003; PEERLINGS and OOMS, 2008; BAKUCS and FERTŐ, 2009). Based on empirical data from 2007 and 2011, we aim to study the effects of various factors on the probability of farm exit, decline and growth, relative to retaining farm size. Since the SO in farming may vary from year-to-year depending on crop rotations, calving or culling rates and timing, diseases, etc., it is reasonable to assume that the variation of SO within a specific range should be considered as relative stability rather than farm growth or exit. However, there is no empirically correct threshold for growth or decline rates.

Based on the percentiles of changes in the SO (Table 1) and an average of 13.1% growth in SO in 164 remaining farms (32 farms exited between 2006 and 2010), a 15% growth and decline threshold was con-

Figure 3. Distribution of farms that retained agricultural production according to the changes in the standard outputs in 2006-2010 (N=164)



Source: own calculations

sidered appropriate for the analysis. Hence, if a farm's SO in 2010 was less than 85% of its SO in 2006, the farm size was considered to be decreasing. Therefore, of the 164 farms that retained agricultural production, 34.8% (Figure 3), and in the whole sample of 196 farms 29.1%, were deemed to be decreasing. If the farm's SO in 2010 exceeded 115% of the respective value in 2006, the farm was considered to be increasing (28.7% of farms that retained agricultural production and 24.0% of the farms in the whole sample). If the SO in 2010 was in the range of 85-115% compared to the value in 2006, the farm size was considered to be stable (36.6% of farms that retained agricultural production and 30.6% of the farms in the whole sample). The farms for which the farm operator declared that the farm has ceased agricultural production, or which the SO was zero in 2010, were considered to be those that have exited from farming (16.3% of the whole sample).

The definitions and descriptive statistics of dependent and independent variables are given in Table 2. Multinomial logit regression was used to estimate the effects of the explanatory variables on the probability of farm exit, decline and growth relative to the base situation, which here is retaining the farm's economic size in the range of 85-115% of the respective figure in 2006. The multinomial logit regression model was specified as:

$$(1) \text{Logit}(\text{development}_{j(\text{stable})}) = \alpha_0 + \alpha_{1jk} \text{age} + \alpha_{2ji} \text{size} + \alpha_{3j} \text{off_farm} + \alpha_{4j} \text{semisubs} + \alpha_{5j} \text{education} + \alpha_{6j} \text{successors} + \alpha_{7j} \text{restituted} + \alpha_{8j} \text{gr_livestock} + \epsilon_j$$

Table 1. Percentiles of farms that retained agricultural production according to the changes in the standard outputs in 2006-2010 (N=164)

Per-centile	N	Range (index of standard output)	Average standard output in 2006, euros	Average area in 2006, ha
0.1	17	0.069-0.509	21,352	38.0
0.2	16	0.509-0.686	13,256	33.8
0.3	16	0.686-0.799	13,586	28.5
0.4	17	0.799-0.890	147,681	231.9
0.5	16	0.890-0.953	54,416	97.6
0.6	16	0.953-1.010	74,297	153.2
0.7	17	1.010-1.124	31,160	87.2
0.8	16	1.124-1.233	88,490	292.4
0.9	16	1.233-1.364	156,739	278.4
1.0	17	1.364-9.532	107,863	101.7

Source: own calculations

Table 2. Definition and descriptive statistics of variables

Variable	Definition	Scale/measurement	Obs	Mean	Std. dev.	Min	Max
Dependent variable							
<i>Development</i>	Exit or change in farm standard output (SO) in 2006-2010	0=stable (2010 SO 85-115% of 2006 SO)	60				
		1=exit from farming	32				
		2=decreasing (2010 SO <85% of 2006 SO)	57				
		3=increasing (2010 SO >115% of 2006 SO)	47				
Explanatory variables							
<i>Age</i>	Age of the farm operator in 2007	<40 years	16	35.0	4.2	25	39
		40-49 years	38	44.9	2.9	40	49
		50-59 years	66	54.3	2.9	50	59
		≥60 years	76	68.7	5.8	60	85
<i>Size</i>	Farm size measured in 2006 SO (thousand euros)	1 st quartile	49	4.4	1.8	0.4	7.7
		2 nd quartile	49	10.0	1.6	7.7	13.4
		3 rd quartile	49	21.0	5.8	13.4	31.6
		4 th quartile	49	210.1	329.9	31.6	1458.6
<i>Off_farm</i>	The farm operator has an off-farm job.	0=no, 1=yes	196	0.24	0.43	0	1
<i>Semisubs</i>	The farm is participating in the semi-subsistence farming scheme.	0=no, 1=yes	196	0.45	0.50	0	1
<i>Education</i>	Farm operator's level of education	1=basic education 2=secondary education 3=vocational education 4=higher education	196	2.79	1.00	1	4
<i>Successors</i>	Farm operator's evaluation on the availability of successors	1-very poor, 2-poor, 3-adequate, 4-good, 5-very good	196	2.37	1.08	1	5
<i>Restituted</i>	The farm was established on the basis of restituted land.	0=no, 1=yes	196	0.59	0.49	0	1
<i>Gr_livestock</i>	Farm is specialised in grazing livestock.	0=no, 1=yes	196	0.52	0.50	0	1

Source: own calculations based on survey data from 2007 and 2011, and paying agency data from 2006 and 2010.

From the model specification in equation (1), $development_j$ are the probabilities of farm exit, decline or growth relative to retaining the farm's economic size (stable) within the chosen boundaries (85-115%). The α_j are the parameters to be estimated simultaneously for the three regression equations represented by equation (1), and ϵ_j are the corresponding residual terms.

The variable *Age* measures the age of the farm operator. In 2006, the average age of the respondents was 56.5 years. In the empirical estimation, the variable is categorised into four (*k*) groups of <40, 40-49, 50-59 and ≥60 years and the group of ≥60 years is used as the basis for comparisons. The variable *Size* is classified into 4 (*l*) quartiles according to the SO of farms in 2006. The first three quartiles are used as dummy variables in the empirical estimation and the fourth quartile is a basis for comparisons. In the first

size quartile, the farm SO ranges from 360 to 7,652 euros, in the second quartile the SO range is 7,652-13,358 euros, and in the third quartile 13,358-31,634 euros. In the fourth quartile, the values of farm SO are between 31,634 and 1,458,626 euros.

Off_farm is a dummy variable that represents whether the farm operator has an off-farm job in addition to the work in the farm. 24% of the respondents declared having an off-farm job. The dummy variable *Semisubs* indicates whether the farm was participating in the semi-subsistence farming scheme in 2006. 45% of the respondents participated in the scheme. *Education* describes the level of formal education of the farm operator and is a proxy for human capital. The variable is scaled increasingly starting from the value 1 (basic education) to 4 (higher education). This variable is assumed to be roughly continuous. The variable

Successors describes the farm operator's subjective evaluation about the availability of successors for farm transfer in the Likert scale from 1 (very poor) to 5 (very good), and is assumed to be roughly continuous. The mean of the given evaluations was 2.37, indicating that most of the farmers do not consider farm transfer to a successor likely. 59.7% of the farm operators evaluated the availability of successors as 'very poor' or 'poor', and just 16.3% of the respondents evaluated the availability of successors as 'good' or 'very good'.

The dummy variable *Restituted* indicates whether the farm was established at the beginning of transition on the basis of restituted land or founded in some other way. In our sample, 14 farms (7.1%) were established as a result of the privatisation of a functioning previous collective farm or part of the collective farm, 56 farms (28.6%) were established as private farms on rented, privatised or bought land³, 11 farms (5.6%) were bought from other farmers, and 115 farms (58.7%) were established on the basis of restituted land or farmsteads.

Gr livestock is a dummy variable that indicates whether the farm was specialised in grazing livestock (milk, beef, sheep or goats) in 2006. In the sample, 52.0% of the respondents belonged to the *Gr livestock* farm type, 30.6% of the respondents were specialised in arable production, 16.8% were farms with mixed activities and 1 farm was specialised in horticulture.

4 Results and Discussion

The estimates of the specified model (1) are given in Table 3. Next, the estimated effects of explanatory variables are discussed.

³ There were several ways in which a private farm could have been established. In 1988 a regulation was adopted for the allocation of the marginal land of collective farms to private farms, as well as selling of agricultural machinery to private farms (EMA, 2002). The Farm Law of 1989 envisaged, in addition to hereditary (based on pre-collectivisation farms), establishment of new tenant farms. In order to address the social equity concern (SWINNEN, 1999), the Estonian Land Reform Act of 1991 enacted the privatisation of land by pre-emptive rights (for people whose buildings were located on land subject to privatisation) or on general grounds (for rural inhabitants in the vicinity of their homes) (EMA, 2002).

Table 3. The results of multinomial logit estimates

Variable	1=exit from farming	2=decrease of standard output>15%	3=growth of standard output>15%
<i>Intercept</i>	1.076 (1.865)	0.284 (1.129)	-2.273 (1.319)*
<i>Age<40</i>	-1.222 (1.406)	-1.001 (0.828)	0.464 (0.804)
<i>Age 40-49</i>	-1.521 (0.951)	-0.929 (0.635)	1.238 (0.644)*
<i>Age 50-59</i>	-1.274 (0.691)*	-0.759 (0.487)	0.441 (0.589)
<i>Successors</i>	-1.095 (0.350)***	-0.236 (0.199)	0.263 (0.207)
<i>Farm size 1st quartile</i>	2.936 (1.265)**	1.562 (0.697)**	1.039 (0.734)
<i>Farm size 2nd quartile</i>	1.881 (1.278)	1.119 (0.644)*	0.250 (0.664)
<i>Farm size 3rd quartile</i>	1.239 (1.382)	1.579 (0.630)**	0.903 (0.600)
<i>Off_farm</i>	1.568 (0.698)**	0.293 (0.523)	-0.287 (0.566)
<i>Semisubs</i>	-1.862 (0.658)***	-0.321 (0.431)	-0.562 (0.469)
<i>Education</i>	-0.056 (0.293)	-0.019 (0.215)	0.471 (0.263)*
<i>Restituted</i>	0.364 (0.625)	-0.700 (0.422)*	-1.052 (0.440)**
<i>Gr livestock</i>	-1.160 (0.642)*	0.364 (0.420)	-0.367 (0.448)
<i>McFadden pseudo R²</i>	0.223		
<i>Log likelihood</i>	-207.044		
<i>Number of observations</i>	196		

Figures in parentheses are standard errors.

*significant at 0.1 level; **significant at 0.05 level; ***significant at 0.01 level

Source: own calculations

4.1 Farm Life Cycle

In this paper, we use the age of the farm operator and the farm operator's evaluation on the availability of successors as the variables related to the farm life cycle. The estimates of the model confirm the relevance of the farm life cycle on farm growth, decline and exit. From Table 3, it appears that the probability of exiting from farming is lower in younger age groups compared to the farm operators in the age group ≥ 60 years. The difference is significant at the 0.1 level in the 50-59 year age group. The signs of regression coefficients indicate that the probability of farm size decline is also lower in younger age groups. However, these coefficients are not statistically significant. It appears that the probability of farm growth is significantly higher if the farm operator is 40-49 years old. In the age groups <40 years and 50-59 years, the farm growth probability did not differ significantly

compared to age group ≥ 60 years. This is in line with BOEHLJE's (1990) suggestion that the farm operator first needs to acquire a "critical mass" of capital and managerial ability before farm extension, and it supports the findings of GLAUBEN et al. (2002), CALUS and VAN HUYLENBROECK (2008), CALUS et al. (2008), VÄRE (2006) that the succession effect plays a role from the age of 45, and the early designation of the successor motivates the farmer to invest and improve the management of the farm.

Our results confirm the results of earlier studies (WEISS, 1999; CALUS and VAN HUYLENBROECK, 2008; POTTER and LOBLEY, 1992) about the significance of the availability of successors on farm survival prospects. From Table 3, it appears that if the availability of successors (in the farmer's opinion) is good, the probability of farm exit is significantly lower. However, the results do not indicate whether the farmer's subjective evaluation about the availability of successors have a significant influence on the probabilities of farm decline and growth.

4.2 Human Capital

Human capital is a crucial factor in economic development, both at micro and macro levels. As proxies of human capital, we use the farm operator's formal level of education and the farm operator's off-farm job status. RIZOV and MATHIJS (2003) suggest that farms with managers possessing greater stocks of human capital should be more efficient, and therefore should survive and grow relatively faster. Our results show that the farm operator's level of education has a moderately significant (at 0.1 level) positive effect on the probability of farm growth. With respect to the probability of farm decline and exit, the effect of education was insignificant (Table 3). The positive effect of level of education on farm growth probability implies that for new entrants and those young farmers who have taken over the family farm, supportive educational and advisory system would increase farm growth and survival probabilities.

In our sample, the farm operator's level of education had a significant effect on the probability of having an off-farm job, confirming the argument that human capital may increase the earning capacity of a farm operator in the non-farm economy.⁴ In addition, the probability of having an off-farm job was significantly higher in the case of younger farm operators

and smaller farms. The average of the *Education* variable of those farm operators that had an off farm job was 3.04, compared to 2.70 in the farms where the farmer did not have an off-farm job. The average age of farm operators that had an off-farm job was 52.6 years, compared to 57.7 years of those operators who did not have an off-farm job. The average area of the farms where the farm operator had an off-farm job was 93.4 ha, compared to 124.1 ha if the farm operator did not have an off-farm job. The estimates of model (1) indicate that in Estonia, having an off-farm job has a positive effect on the probability of farm exits. With regard to the probabilities of farm decline or growth, the effect of having an off-farm was insignificant. Therefore, our results indicate that in Estonia it is more likely that an off-farm job reduces rather than increases the probability of farm survival.

4.3 Size and Specialisation

In our analysis, farm SO was used as a measure of farm size. In Estonia, where the farm size structure is dualistic, it is often argued that larger farms have better preconditions for competition and growth. Our results indicate that farm size has a significant negative effect on farm exit probability in the 1st size quartile and on decline probabilities in the first three size quartiles. The small farms in the 1st quartile of SO had a significantly ($p < 0.05$) higher probability of exiting from farming compared to farms in the 4th quartile. In the case of farm decline, the first three size groups (quartiles) had a significantly higher probability to decline compared to large farms in the 4th quartile. At the same time, farm size did not have a significant effect on the probability of farm growth. This is in accordance with the findings of WEISS (1999), RIZOV and MATHIJS (2003) who suggested that larger farms tend to exhibit lower growth and decline rates. However, it also suggests that in the case of dualistic size structures the results of the analysis would benefit if the sample of very large farms were studied separately from the sample of smaller farms.

As a measure of farm specialisation, a dummy variable *Gr_livestock* was used, indicating if the farm was specialised in grazing livestock in 2006. The results in Table 3 demonstrate that the farms specialised in grazing livestock have a significantly ($p < 0.1$) lower probability to exit from farming. This result is in line with BREUSTEDT and GLAUBEN (2007), who found that in regions specialised in livestock production the loss in the number of farms was significantly smaller.

⁴ The results of the respective binary logit regression are not reported here.

4.4 Semi-subsistence Farming and Way of Establishment of the Farm

DAVIDOVA (2011) has suggested that the CAP has to help semi-subsistence farms to commercialise or exit. Our results indicate that participation in the semi-subsistence farming scheme in 2006 did not have a significant effect on the probabilities of farm growth (which could be considered as a proxy for commercialisation) and farm decline (Table 3). However, participation in the semi-subsistence farming scheme significantly decreased the probability of farm exit. Nevertheless, our results do not confirm its effect on farm growth (commercialisation), which was one of the aims of the scheme. The results may also be influenced by the fact that the ending point of the considered period was also the ending point of a large part of the five-year contracts of the scheme. Therefore, in the following years, the negative effect of the scheme on the exit probability of smaller farms may diminish. Our results confirm the suggestion of DAVIDOVA et al. (2009) that subsistence production could be favoured by households with non-farm income or retired households who wish to satisfy lifestyle and consumption preferences. In the survey, farmers were asked to position their farming related values in the Likert scale of 1 to 5 between two extremes: 'profit is more important than farming as a lifestyle' (1) and 'farming as a lifestyle is more important than profit' (5). The average of this variable was 4.0 in the case of semi-subsistence farmers and 3.5 in the case of farmers that did not participate in the scheme. In the cases where farm operators have lifestyle and consumption preferences, it is also probable that the farms will remain in business, but will decrease in size as the farm operator gets older. However, the results indicate that through decreasing the farm exit probability, such payment schemes are slowing down the process of structural changes.

In the Estonian land, agricultural and ownership reforms in the early 1990s, it was decided that the pre-war farms and farmland should be returned to the heirs of the dispossessed owners. GLAUBEN et al. (2004a) found that farms that have been run by the same family for several generations show a higher probability of being transferred within the same family. Our results indicate that the farms that were founded based on returned land or farmsteads are on average smaller (64.0 ha compared to 191.6 ha if the farm was established via privatisation or bought), and they have significantly lower growth and decline probabilities. At the same time, such farms do not have a high-

er probability to exit. Also, the operators of restituted farms value farming as a lifestyle more highly than other farmers. The average of this variable was 4.0 in the case of restituted farms and 3.4 in the case of other farms. This confirms the suggestion of HEDIN (2005) that the operators of such farms consider it important to maintain the farms of their forefathers.

5 Conclusions

In this paper, we analyse the effects of some socioeconomic and transition-specific factors on the probability of farm growth, decline and exit. Survey data from 2007 and 2011 is combined with data from the registries of the national paying agency. Farm growth and decline rates are calculated based on standard outputs. We consider 15% thresholds, both for farm growth and decline. Farm exits are determined based on the responses of farm operators in 2011 and SO in 2010. Multinomial Logit regression is used in order to estimate the model.

The results indicate that the farm growth probability is highest in the 40-49 year age group. Compared to the age group of ≥ 60 years, farm operators in younger age groups have a lower probability to exit or decline. The availability of successors has a significant negative effect on farm exit probability. This is in line with previous findings regarding the farm life cycle and succession effect (CALUS et al., 2008; WEISS, 1999). We also show that the level of education of the farm operator is positively affecting farm growth probability. The positive effect of education on farm growth probability implies that for young farmers a supportive educational and advisory system would increase farm growth and survival probabilities. In addition, our data confirmed the positive relationship between education and working off-farm as suggested by BOEHLJE (1990). Off-farm work is more probable in smaller farms and in cases of younger and better educated farm managers, and it is increasing the probability of exiting from farming. Grazing livestock farms were shown to have a significantly lower probability to exit from farming.

Our results indicate that the semi-subsistence farming scheme slowed down the process of structural changes in regard to smaller farms. The farms that participated in the semi-subsistence farming scheme had a lower probability to exit in the considered period (2006-2010). However, the semi-subsistence farming scheme did not have a significant effect on the probability of farm growth or decline. It is likely that

the effects of the semi-subsistence farming scheme will begin to diminish now that it has completed.

In most western countries, the prevailing farm ownership and management type is the family farm that is handed down from one generation to the next. In Estonia, such succession patterns are not well developed due to the structural breaks of the past 100 years. Nevertheless, our results suggest that farms that were established based on returned land or farmsteads do exhibit lower decline and growth probabilities, and they are more inclined to retain the farm size. This implies that the continuity of the ownership and respect for forefather's work is a factor that influences the process of structural changes.

While participation in the semi-subsistence farming scheme reduces the exit probability, and the fact that a farm has been founded on the basis of restituted land or farmstead reduces farm growth and decline probability, the effects of other factors imply that the process of structural changes in Estonian agriculture today is largely following the same pattern as in other western countries. Farm growth is more likely in the case of middle-aged (40–49 years) and better educated farm operators; farm decline is more likely in the case of smaller farms. Exit from farming is more likely if the farm operator's age is 60 years or more, if the farm is very small (1st quartile of SO), or if the farm operator has an off-farm job, and it is less likely if the farm is a grazing livestock farm.

Today, the structure of Estonian agricultural producers is polarised – there are a large number of small producers that cultivate a relatively small proportion of land, and a relatively small number of larger agricultural producers that cultivate most of the agricultural land. The tendency towards a dualistic farm structure was also suggested by UNWIN (1997): “If Estonia is indeed to move to a position of economic convergence by which it will be able to join the EU, its agrarian economy will have to undergo further substantial changes. Ironically, this may well lead to a landholding structure much more reminiscent of the 1,000 collective farms that existed in 1952 or the ca. 1,000 large landed estates liquidated by the 1919 Land Reform, than of the numerous small private farms existing in the 1930s or the estimates of perhaps 60,000 private farms by the end of the 1990s that were being suggested at the beginning of the decade.” Our results show that larger farms have a higher probability to remain in business, and they have a lower probability to exit or decline. At the same time, larger farms do not have higher probability to grow. In addi-

tion to the fact that the farm size structure is dualistic, the findings of PÖDER et al. (2011) suggest that the values of the operators of large and small farms also tend to be polarised. This implies that in regard to dualistic farm structures, the future analyses of farm growth, decline and exit would benefit if the effects were studied separately in farm size groups.

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ORIGINAL PUBLICATIONS

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Entrepreneurial Activity in Rural Municipalities of Three South-Eastern Estonian Counties in 2005- 2009: a Cluster Analysis of Rural Municipalities

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Abstract. The aim of the paper is to study entrepreneurial activity in rural municipalities in the South-Eastern Estonia. The 36 rural municipalities of Põlva, Võru and Valga County have suffered a fair share of socio-economic problems since the beginning of transition in the 1990s, among them the low entrepreneurial activity, population loss as the more active population migrated from the area, ageing of population, higher rate of inactivity, unemployment, and considerably lower wages than Estonian average. The paper compares different social and economic data of the three counties with the national average indicators. An overview is given on the entrepreneurial activity rate of rural municipalities in the three counties from 2005 to 2009. A hierarchical cluster analysis is conducted in order to study the differences between the rural municipalities. Based on the entrepreneurial activity rate per 1000 inhabitants, and different economic and social indicators, the 36 rural municipalities in three counties are divided into 4 clusters.

Key words: entrepreneurial activity, rural municipalities, cluster analysis, Estonian regional development.

Introduction

The South-Eastern region of Estonia, including Põlva, Võru, and Valga Counties, has suffered a fair share of socio-economic problems since the 1990s. The area has been characterised by lower entrepreneurial activity, population outmigration, ageing of population, higher rate of inactivity, unemployment, and considerably lower wages than Estonian average. The present paper studies the entrepreneurial activity in rural municipalities of these counties in 2005 – 2009.

The high regional inequalities appeared in the transition process during the 1990s (Terk E., Raagmaa G., 2004; Jauhiainen J. S., Ristkok P., 1998; Tamm M., 2002; Kuura A., 2006; Pöder A., 2008). The rural areas were considered mostly to be the “losers”. As M.Tamm (2002) points out, the success of the economic development of a rural municipality depended on its location, its Soviet legacy (e.g. the level of economic development of the former collective farm etc), also on the level of diversification of local economy (Terk E., Raagmaa G., 2004), and especially the availability of non-agricultural jobs (Lõo A., 2002, 2005). The location of municipalities studied in the present paper means that there are considerably less employment opportunities for locals, and thus it is highly relevant to study the establishment of local enterprises in the region.

Entrepreneurship. There is a huge body of literature offering different definitions of entrepreneurship and entrepreneur, starting with A.J. Schumpeter (1934) who described the entrepreneur as an innovator who implements change within markets through carrying out of new combinations. Many researchers (e.g. Vesper K.H., 1983; Low M.B., MacMillian I.C., 1998; Learned K.E., 1992 etc) emphasise entrepreneurship as the creation of new businesses. Entrepreneurship contributes to the economy through the creation of new businesses and jobs, economic growths, and innovation (Fayolle A., 2007). D.F. Kuratko (2008) defines an entrepreneur as “an innovator or developer who recognises and seizes opportunities; converts

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those opportunities into workable/manageable ideas; adds value through time, effort, money, or skills; assumes the risks of the competitive and marketplace to implement these ideas; and realises the rewards". A. Fayolle (2007) points out that in economic literature the definition of entrepreneur is presented with multiple facets and combines the roles of capitalist, innovator, opportunist, and even coordinator and organiser of resources. K.D. Glancey and R.W. McQuaid (2000) divide the perspectives on entrepreneurs in literature into the following five sets: first set focuses on the role or function of entrepreneurs in the economy; the second set - on entrepreneurs as those who exhibit particular forms of behaviour; the third set - on the characteristics of entrepreneurs; the fourth set - on the particular events such as creation of new firm or organisation; and the fifth set - on an entrepreneur as an owner and manager of a business.

The legal definition provided by the Estonian Commercial Code (1995) is that an enterprise is a natural entity who offers goods or services for charge in his or her own name where the sales of goods or provision of services is his or her permanent activity, or a company provided by law. As the official data on Estonian enterprises are based on this definition, in this paper, the term "enterprise" implies to natural entities and commercial companies in Estonia and entrepreneurial activity rate implies to the rate of enterprises per 1000 inhabitants.

Entrepreneurial intentions of Estonians. People's willingness to establish enterprises and to become entrepreneurs depends on many different aspects (entrepreneurial intentions, e.g., studied among other researchers by Kruger N.F., Carsrud A.L. 1993; Utsch A., Rauch A., 2000; Kruger N.F. et al, 2000; Gurel E. et al, 2010), like personality characteristics (e.g. Vesper K.H. 1990; Koh H. C. 1996 etc), culture (Mueller S.L., Thomas A.S., 2001; Pillis E., Reardon K.K., 2007 etc), and environment (Vesper K. H. 1990; Minguzzi A., Passaro R., 2000; Lu J., Tao Z., 2010 etc). D.R. Gnyawali and D.S. Fogel (1994) define entrepreneurial environment as a combination of factors: the overall economic, socio-cultural, and political factors that influence people's willingness and ability to undertake entrepreneurial activities; and the availability of assistance and support services that facilitate the start-up process. The results of Eurobarometer studies (Flash EB No. 160, 2004; Flash EB No 283, 2009) have indicated that in international comparison Estonian people are not very willing to become self-employed and prefer the employee status. The lack of entrepreneurial spirit (Eesti Konjunkturiinstituut, 2004; Kolbre E. et al, 2006) poses a problem to the development of Estonia, and so the topic of the present paper is highly relevant.

The aim of the paper is to study entrepreneurial activity, and its characteristics in rural municipalities in three South-Eastern counties of Estonia from 2005 to 2009. Totally 36 rural municipalities of Põlva County, Valga County, and Võru County were studied in the paper. The paper is organised as follows. After the introduction, the results part is divided into two subparts: an overview on the socio-economic situation of the three counties and the results of the cluster analysis. The results are followed by conclusions. The paper has the following **research tasks**: to give an overview on the socio-economic situation of the region; to study the entrepreneurial activity in the rural municipalities of three counties in 2005-2009; and to cluster the rural municipalities in order to study the differences between the municipalities. The **following methods** have been used in the present research: a hierarchical cluster analysis is conducted based on data on the entrepreneurial activity rate per 1000 inhabitants and different economic and social indicators of the 36 rural municipalities in three counties as well as monographic, analysis and synthesis; and time series analysis.

Results and discussion

1. An overview of the socio-economic situation of Põlva, Valga, and Võru Counties

Location and administrative division. Estonia is administratively divided into 15 counties (Figure 1). The counties are in turn divided into the local government units: towns and rural municipalities. Põlva County, Võru County, and Valga County are situated in the South-Eastern part of Estonia bordering with Russia and Latvia. In 2011, the three counties were divided into the following administrative units (Statistics Estonia, 2011): 4 towns and 36 rural municipalities. Three rural municipalities in those counties include also a town without

municipal status – it means that since the 1990s some former towns have been joined to the neighbouring rural municipalities into one local government unit.

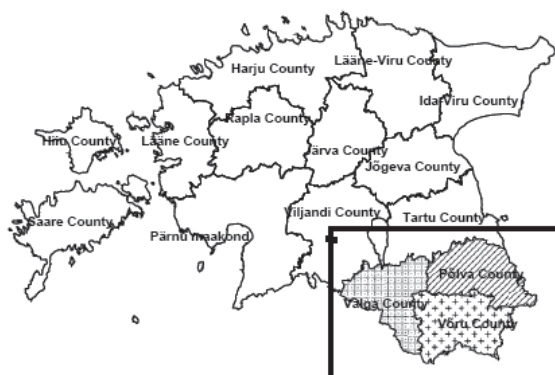


Fig. 1. Estonian Counties in 2011 and three counties studied in the present paper

Population. The location of the counties means they are farther away from economic centres and the larger towns of Estonia. The local towns that are the regional centres are small (table 1). The rural population of the counties was 65229 in 2009 (4.8% of Estonian population; Statistics Estonia, 2011).

Table 1
Population and labour force of Põlva, Valga, and Võru Counties between 2005 and 2009

	Estonia	Põlva			Valga			Võru		
	Total	County total	Towns	Rural municipalities	County total	Towns	Rural municipalities	County total	Towns	Rural municipalities
Area, km ²	43432	2165	5	2159	2044	21	2022	2305	13	2292
Local government units 2009, No.	226	14	1	13	13	2	11	13	1	12
Population 2009, No.	1340415	31002	6533	24469	34135	16839	17296	37888	14424	23464
Share of Estonian population 2009, %	100	2.3	0.5	1.8	2.5	1.2	1.3	2.8	1.1	1.7
Population 2005, No.	1347510	31752	6506	25246	34867	17104	17763	38677	14609	24068
Population gain/loss from 2005 to 2009, %	-0.5	-2.4	0.4	-3.1	-2.1	-1.5	-2.6	-2.0	-1.3	-2.5
Density 2009, inhabitants per square kilometre	30.9	14.3	1194.3	11.3	16.7	789.1	8.6	16.4	1089.4	10.2
Demographic labour pressure index 2009	0.81	0.83	0.98	0.8	0.92	0.92	0.92	0.88	0.96	0.83
Demographic labour pressure index 2005	0.96	1.1	1.35	1.04	1.03	1.0	1.06	1.08	1.17	1.03

Source: Statistics Estonia, 2011

It has decreased from 67077 people in 2005. In comparison with 2005 by 2009 the rural municipalities of Põlva County has lost 3.1% of their population, the rural municipalities of Valga County and Võru County have lost 2.6% and 2.5% respectively of their previous population. Demographic labour pressure index² has changed considerably over the 5-year period. As it exceeded 1 in 2005 indicating that the number of people entering the labour market was bigger than people retiring in the next 10 years, by 2009 it has fallen below 1 in all the counties. It is even smaller in rural municipalities.

Table 2

Labour force and average monthly wages in Põlva, Valga and Võru County 2005 and 2009

	Estonia				Põlva			Valga			Võru		
	Total	County total	Towns	Rural municipalities	County total	Towns	Rural municipalities	County total	Towns	Rural municipalities			
Labour force 2009, no.	690900	12100	5000	7100	15600	10300	5300	17400	8600	8800			
Share of Estonian labour force 2009, %	100.0	1.8	0.8	1.0	2.3	1.5	0.8	2.5	1.2	1.3			
Labour force 2005, no.	659600	12700	4200	8500	13900	9000	4900	153000	8300	7000			
Labour force participation rate 2009, %	66.5	51.4	60.5	46.6	60.4	65.2	53.0	60.8	70.8	53.4			
Labour force participation rate 2005, %	62.9	53.2	56.1	52	53.5	57.6	47.3	53.4	62.6	45.5			
Employment rate 2009, %	57.4	45.2	56.4	39.3	49.7	52.8	44.8	51.0	59.0	45.2			
Employment rate 2005, %	57.9	46.6	50.8	44.7	51.5	54.6	46.8	51.1	61.4	42.3			
Unemployment rate 2009, %	14.4	12.6	n/a	n/a	18.2	n/a	n/a	16.1	n/a	n/a			
Unemployment rate 2005, %	8.3	13.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Average monthly gross wages 2009, euros	783.8	640.7	n/a	n/a	573.7	n/a	n/a	646.7	n/a	n/a			
Share of Estonian average wage 2009, %	100	81.7	n/a	n/a	73.2	n/a	n/a	82.5	n/a	n/a			
Average monthly gross wages 2005, euros	516	396.9	n/a	n/a	388.7	n/a	n/a	401.6	n/a	n/a			

Source: Statistics Estonia, 2011

Labour force. Estonian labour force numbers have increased from 2005 to 2009 and one reason behind this is that large birth cohorts of the beginning of the 1990s started entering the labour force. However, the economic inactivity has been higher and the labour force participation rate³ lower in the studied rural areas (Table 2). In rural municipalities of Põlva County, the labour force participation rate dropped from 52% in 2005 to 46.6% in 2009 even though the average participation in Estonia and in Võru and Valga Counties increased during this period. The complicated socio-economic situation in the rural areas of the region is illustrated by the employment rate⁴ that has been under 50% for the rural municipalities of the counties and has even decreased to 39.3% in 2009 in rural municipalities of Põlva County.

Wages in Põlva, Valga and Võru Counties have been amongst the lowest of Estonian counties since the 1990s. As the data are not available on the local government level, they are presented on the county level (Table 2). In 2009 the average monthly gross wage in Võru County was 82.5%, in Põlva County was 81.7% and in Valga County just 73.2% of Estonian average.

² Demographic labour pressure index — ratio of the persons (aged 5-14) who will enter the labour market to the persons (aged 55-64) who will exit the labour market during the next ten years because of ageing. If the index is bigger than one, the number of persons entering the labour market is larger than the number of persons potentially leaving it because of ageing. (Statistics Estonia, 2011)

³ The share of the labour force in the working-age population

⁴ Share of the employed in the working-age population

Enterprises and entrepreneurial activity rate. In 2005 there were 65362 enterprises in the statistical profile in Estonia and the number increased to 81909 in 2009 (Table 3). In 2009, thus 5.4% of Estonian enterprises were located in Põlva, Valga, and Võru Counties and 3.6% of Estonian enterprises were located in the rural areas of those three counties.

Table 3

Enterprise in statistical profile in Põlva, Valga and Võru Counties from 2005 to 2009

	Estonia	Põlva			Valga			Võru		
	Total	County total	Towns	Rural municipalities	County total	Towns	Rural municipalities	County total	Towns	Rural municipalities
Number of enterprises										
2009	81909	1333	311	1022	1385	526	859	1732	617	1115
2008	77948	1251	279	972	1301	480	821	1671	587	1084
2007	76159	1235	295	940	1297	474	823	1631	570	1061
2006	71012	1200	286	914	1292	446	846	1506	514	992
2005	65362	1147	264	883	1232	419	813	1428	476	952
Share in Estonian enterprises 2009, %	100	1.6	0.4	1.2	1.7	0.6	1.0	2.1	0.8	1.4
Entrepreneurial activity rate per 1000 inhabitants										
2009	61.1	43.0	47.6	41.8	40.6	31.2	49.7	45.7	42.8	47.5
2008	58.1	40.1	42.8	39.4	38.0	28.4	47.3	43.9	40.6	45.9
2007	56.7	39.3	45.3	37.8	37.6	27.9	47.1	42.6	39.3	44.7
2006	52.8	38.0	43.9	36.5	37.3	26.2	48.0	39.1	35.3	41.5
2005	48.5	36.1	40.6	35.0	35.3	24.5	45.8	36.9	32.6	39.6
Enterprise birth rate										
2008	10.8	7.9	5.1	9.5	12.0	13.1	10.8	10.2	9.2	11.6
2005	13.8	13.1	11.3	14.2	13.6	11.8	15.7	15.1	12.0	19.3
Enterprise death rate										
2008	10.0	6.7	6.0	7.2	10.8	10.8	10.8	8.7	8.1	9.3
2005	6.7	6.3	5.2	7.0	6.8	5.4	8.4	5.3	4.1	6.9

Source: Statistics Estonia, 2011

The entrepreneurial activity rate (enterprises per 1000 inhabitants) has been calculated for the studied region. On the country level, an interesting fact is that the entrepreneurial activity rate in rural municipalities of Võru County and Valga County is higher than that in the towns. In Põlva County the rate is lower for rural municipalities. This indicated to large regional discrepancies that a more specifically studied with cluster analysis. There is also another explanation if one looks at the average size of the enterprises. For example, in 2009 the share of microenterprises (0-9 employees) was 86.6% for towns in Põlva, 87.8% in Valga, and 86.5% in Võru County, while for the rural municipalities the indicator was 94.5%, 93.7%, and 95.5% respectively. Statistical data on enterprise birth rate⁵ and enterprise death rate⁶ are available only for the years 2005- 2008. In 2008, the enterprise birth rate was lower in the counties studied compared with 2005. One exception was the rate for towns in Valga County. The enterprise death rate was higher on the county level in 2008 than in 2005. In 2008 in the rural municipalities of Põlva County and Võru County it was higher than in towns.

2. The results of the cluster analysis of rural municipalities of Põlva, Valga and Võru Counties

In order to study similarities and differences between the rural municipalities of three counties, a hierarchical cluster analysis was conducted using SPSS. The following economic and social variables were used: entrepreneurial activity rate for 2009, entrepreneurial activity rate for 2005, population in 2009, demographic labour pressure index for 2009 and demographic labour pressure index for 2005, share of primary sector enterprises in 2009,

⁵ Enterprise birth rate — the share of newly born enterprises in the number of active enterprises

⁶ Enterprise death rate — the share of dead enterprises in the number of active enterprise

The 14 municipalities (Tables 4 and 5) in Cluster 1 have the lowest entrepreneurial activity rate. The average population in the cluster is close to that of Cluster 4 and is higher than in Cluster 2, but lower than in Cluster 3. The demographic labour pressure index indicates that the demographic situation has worsened over the period as the share of young people entering the labour market has decreased, but its mean value is close to the average of all clusters. The annual enterprise birth rate and death rate are higher in this group. From the population point of view, the municipalities in this cluster share similarities with those in Cluster 4, but with lower entrepreneurial activity rate, it could be described as medium size (population wise) municipalities with lower entrepreneurial activity.

The nine municipalities in Cluster 2 have the highest average entrepreneurial activity rate, yet the smallest population, lowest population density, and lowest demographic pressure index. The share of primary sector enterprises was close to the average, and annual enterprise birth rate and death rate a little lower than the average. This cluster could be characterised as small, but highly entrepreneurial. One interpretation is that the high entrepreneurial activity is born out of necessity. With lack of other employment opportunities in small municipalities, people are forced to become self-employed.

Cluster 3 consists of group of 5 municipalities and the rural municipalities with the largest population in this region are in this group and for this reason, the average population and population density is so much higher in this group. All the municipalities either include a city without municipal status or are adjacent to local towns. This can also explain the lowest share of primary sector enterprises. The nearness of local towns can be considered as one factor that causes lower entrepreneurial activity as the towns provide employment opportunities for rural residents. This group could be characterised as the largest rural municipalities in good location, but with lower entrepreneurial activity rate.

Table 4

Mean values for the four groups of municipalities

	Clusters				Total
	1	2	3	4	
Entrepreneurial activity rate, 2009	38.9	56.1	45.0	51.1	46.7
Entrepreneurial activity rate, 2005	33.9	48.0	37.1	49.5	41.3
Population in 2009	1463.4	1175.3	4482.0	1469.3	1811.9
Demographic labour pressure index, 2009	0.8	0.7	0.8	1.1	0.8
Demographic labour pressure index, 2005	1.0	0.9	1.0	1.3	1.1
Share of primary sector enterprises in 2009	54.2	55.0	39.8	61.4	54.0
Population density in 2009	9.3	7.1	19.1	8.3	9.9
Annual enterprise birth-rate from 2005 to 2008	15.2	13.3	14.3	12.8	14.1
Annual enterprise death rate from 2005 to 2008	9.4	5.3	6.5	7.3	7.5

Eight municipalities in Cluster 4 are in some respect similar to those in Cluster 1, but the economic activity rate is higher for Cluster 4 and the population density somewhat lower. One distinctive trait is highest share of primary sector enterprises.

Table 5

Local rural municipalities of Põlva, Valga, and Võru Counties by the cluster

Clusters			
1	2	3	4
Ahja	Kõlleste	Põlva	Värskla
Kanepi	Mikitamäe	Räpina	Helme
Laheda	Orava	Otepää	Hummuli
Mooste	Valgjärve	Antsla	Palupera
Vastse-Kuuste	Karula	Võru	Sangaste
Veriora	Haanja		Taheva
Puka	Meremäe		Sõmerpalu
Põdrala	Misso		Urvaste
Tõlliste	Rõuge		
Õru			
Lasva			
Mõniste			
Varstu vald			
Vastseliina			

The demographic labour pressure index has decreased between 2005 and 2009, but in comparison with other clusters, this group is in better situation as the share of 0- 14 year olds is larger than that of 55- 64 year olds. This group could be characterised as medium sized municipalities with higher entrepreneurial activity.

Conclusions

The aim of the paper was to study entrepreneurial activity in 36 rural municipalities in three South-Eastern Estonian counties. Different socio-economic data were studied and a cluster analysis to group municipalities based on their entrepreneurial activity rate and other economic and demographic data was conducted in the study. As the availability of data on the local municipality level are limited, the overview on different socio-economic indicators concentrated on the more general county level.

The hierarchical cluster analysis offered a more specific opportunity to study the differences between the 36 rural municipalities in the area. In the analysis, the rural municipalities were divided into 4 groups. The largest group of 14 municipalities (Cluster 1) could be described as medium size municipalities with lower entrepreneurial activity. Cluster 2 consisting of 9 municipalities could be called small, but highly entrepreneurial. Five municipalities in Cluster 3 could be characterised as largest municipalities that include city without municipal status or neighbouring local towns, in good location, but with lower entrepreneurial activity rate. The eight municipalities (Cluster 4) are medium sized municipalities with higher entrepreneurial activity.

The results show that the entrepreneurial activity within a region and even in neighbouring municipalities can be very different. Low population density, the distance from larger centres and their employment opportunities can be regarded as one factor that forces the local people to become self-employed. The nearness of larger centres can cause lower entrepreneurial activity in the neighbouring areas as the bigger enterprises in the centres provide sufficient employment opportunities.

Entrepreneurial activity rate provides one possibility to compare economic conditions in regions as it provides information on the variety of economic, social, and cultural factors that influence the development of entrepreneurship. The differences in the entrepreneurial activity rate between regions in the same society and cultural background, and in the same kind of general economic conditions indicate to the more specific local factors that cause the regional discrepancies.

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ENTREPRENEURIAL ACTIVITY IN THE WESTERN ESTONIAN RURAL MUNICIPALITIES IN 2006 AND 2010: A CLUSTER ANALYSIS

Anne Poder¹

The region of Western Estonia consists of four counties, two of which are Estonian biggest islands in the Baltic Sea. The area is often regarded as one region; however, there are many differences between the counties and their rural municipalities, especially those that are separate islands connected with the mainland of Estonia only by ferry or air transport. Since the widening regional disparities appeared in the 1990s, the rural areas have suffered from many socio-economic problems like the loss of population, lower incomes, lower economic diversity, lower labour force participation and employment rate etc. The analysis of entrepreneurial activity is one way to study the socio-economic issues of a region and its enterprises. The aim of the research is to study the entrepreneurial activity in rural municipalities of the four Western Estonian counties in connection with the selected economic indicators. A hierarchical cluster analysis is conducted to group the rural municipalities on the basis of their entrepreneurial activity rate per 1000 inhabitants, share of sole proprietors, share of different sector enterprises and income per employee etc. The forty-eight rural municipalities of those counties are divided into three clusters.

Key words: *entrepreneurial activity, Estonia, hierarchical cluster analysis, regional development, rural enterprises.*

JEL classification: R1

Introduction

Estonia is divided into 15 counties that are in turn divided into local governments: towns and rural municipalities. In 2010, there were 33 towns and 193 rural municipalities in Estonia (Statistics Estonia, 2011). On the regional level, corresponding to the Nomenclature of Territorial Units of Statistics (NUTS) Level 3, the 15 counties are divided into 5 regions: Northern Estonia, Western Estonia, Central Estonia, North-eastern Estonia, and Southern Estonia. The present research studies the rural municipalities of the four counties that form the Western Estonia (Hiiumaa, Saaremaa, Saare, and Pärnu Counties) (Figure 1). Two of the counties: Hiiumaa County and Saaremaa County are two Estonian largest islands. Three counties: Saare, Laane, and Pärnu contain also smaller islands in the Baltic Sea that are separate rural municipalities. The main focus is laid on the characteristics of enterprises in those municipalities in the years 2006 and 2010.

The legal definition on an enterprise in the Estonian Commercial Code (1995) states that it is a natural person who offers goods or services for charge in his or her own name where the sales of goods or provision of services is his or her permanent activity, or a company provided by law. Any natural person may be a registered sole proprietor. As the statistical data on Estonian enterprises used in this analysis are based on the definition of the Commercial Code, the term "enterprise" is referred to sole proprietors and companies for the purpose of this research.

In the economic literature, the term "entrepreneur" is generally associated with a person and not with organisations.

So a sole proprietor may be regarded as an entrepreneur. A.J. Schumpeter (1934) has emphasised that the entrepreneur is an innovator who implements change within markets through the carrying out of new combinations. Often the creation of new businesses is emphasised in connection with the definition of entrepreneurship (e.g. Vesper, 1983; Low, MacMillan, 1998; Learned, 1992 etc.). D.F. Kuratko (2008, p. 530) sees the entrepreneur as "an innovator or developer who recognizes and seizes opportunities; converts those opportunities into workable/manageable ideas; adds value through time, effort, money, or skills; assumes the risks of the competitive marketplace to implement these ideas; and realises the rewards". Fayolle (2007) emphasises that the definition of an entrepreneur is presented with multiple facets as it combines the roles of capitalist, innovator, opportunist, coordinator, and organiser of resources.

The entrepreneurial intentions of people are influenced by many factors. For example, the personal characteristics of individuals such as propensity to risk, innovativeness, tolerance of ambiguity, locus of control (Koh, 1996); the culture (Mueller, Thomas, 2001; Pillis, Reardon, 2007 etc.); the economic and institutional environment (Minguzzi, Passaro, 2001; Lu, Tao, 2010 etc.), have influence on the development of entrepreneurship. Gnyawali and Fogel (1994) describe the entrepreneurial environment as a combination of factors: the overall economic, socio-cultural, and political factors that influence people's willingness and ability to undertake entrepreneurial activities; and the availability of assistance and support services that facilitate the start-up process.

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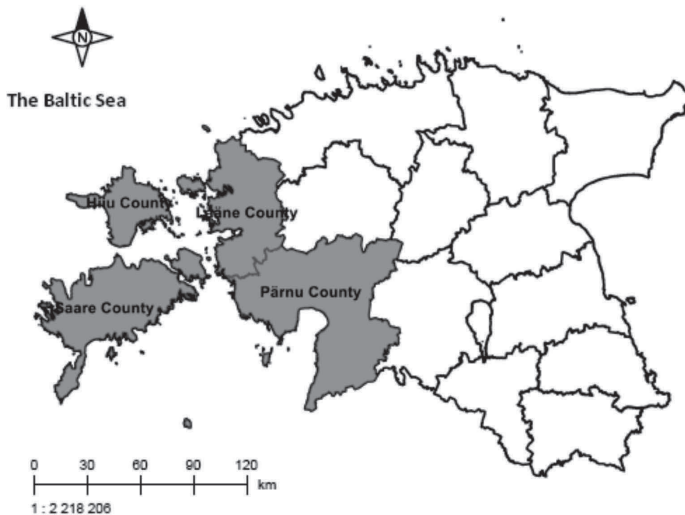


Figure 1. The studied Western Estonian counties

Since several studies have referred to the lack of entrepreneurial spirit of Estonians (Kolbre et al., 2006, Estonian Institute ..., 2004), especially in international comparison (Flash EB No 160, 2004; Flash EB No 283, 2009), the topics of entrepreneurial activity and its regional issues are highly relevant.

The topic of regional entrepreneurial activity has gained relevance because of the developments in the past 20 years. The transition of Estonia in the 1990s from planned economy to market economy brought along the uneven regional development (for example studied by Terk, Raagmaa, 2004; Jauhainen, Ristkok, 1998; Tamm, 2002 etc.). It has manifested itself in high persistent regional economic and social disparities. The Regional Development Strategy of Estonia (2005) describes that the regional differences are significant for the small territory of the country, especially the differences between the main urban centres and other regions in the standard of living and competitive ability. The regional economic development has been strongly polarised to the territory around the Estonian capital Tallinn and other larger towns (Venesaar, 2006). The government has set the goal to curb the concentration of population as well as economic activity in the capital region (Servinski, 2010).

In the transition process, the success of the economic development of a rural municipality was influenced by many factors, like its location and its Soviet legacy (e.g. level of development of the former collective farm) (Tamm, 2002); local economy's level of diversification (Terk, Raagmaa, 2004) and especially the availability of non-agricultural jobs (Loo, 2005); the administrative capability of local municipality, infrastructure and availability of labour (Tamm, 2002) etc. In

the majority of peripheral areas, the diversity of enterprises is low, and in most cases, local economy is based on traditional resource consuming sectors like agriculture, forestry etc (Kiili, Mager, 2006). The issue of local economic diversity, especially the development of non-agricultural enterprises and jobs, gathered relevance because of the decline in agriculture. In the economic transition process, there was a considerable drop in agricultural production and arable land (e.g. studied by Unwin, 1998; Alanen, 1999; Alanen et al, 2001; Virma, 2004; Viira et al, 2009). The majority of newly established private farms were not viable in the long term. This also meant that agriculture was unable to provide sufficient income for the majority of rural population (Loo, 2005). This can also be demonstrated by the drop of agricultural employment in rural population – in 1989, totally 56.9% of rural population was employed by the primary sector, by 2000 it was 22%, and by 2010 it was 11.8% (Statistics Estonia, 2011). By the 2000s, the share of agricultural enterprises among the total number of rural enterprises, had decreased approximately by 50%, but the jobs created in the secondary and tertiary sectors compensated for less than one third of the jobs that had disappeared (Ministry of Agriculture, 2008). This in turn resulted in higher economic inactivity in rural regions. Therefore, the comparison of differences between regions and municipalities in entrepreneurial activity, share of different sector enterprises, share of sole proprietors, and other socio-economic data, is that of interest not only to researchers but also to local stakeholders in order to study how different regions have fared in ongoing social and economic developments.

The aim of the research is to study the entrepreneurial activity in rural municipalities of the four Western Estonian

counties in connection with selected economic indicators like share of sole proprietors, share of different sector enterprises and income per employee etc. Therefore, a hierarchical cluster analysis is conducted and the 48 rural municipalities of those counties are grouped into three clusters. The main focus is laid on the indicators from the year 2010; however, the data of the year 2006 are also given for the comparison purposes.

The paper is organised as follows. The introduction is followed by a short overview on the methodology. The results section is divided into two subsections: a general description of the counties studied is given on the basis of selected socio-economic indicators. It is followed by the results of the hierarchical cluster analysis. The results are discussed in the concluding section.

The following research tasks have been set: to give an overview on the socio-economic situation of the region on the basis of selected economic and social data; to compare the urban/rural indicators and Estonian average indicators; to study the entrepreneurial activity in the Western Estonian rural municipalities in 2006 and 2010; and to cluster the rural municipalities in order to study the differences between the municipalities.

Materials and methods

The following methods have been used for the research purpose: a hierarchical cluster analysis is conducted on the basis of data on the entrepreneurial activity rate per 1000 inhabitants, and different economic and population indicators of the 48 rural municipalities in four counties as well as monograph, and analysis and synthesis methods.

In the present research, the entrepreneurial activity rate is defined as the number of enterprises per 1000 inhabitants. The enterprises mean both companies and sole proprietors, and their data are derived from the database on economically active units of the Statistics Estonia (2011).

Cluster analysis is a multivariate statistical procedure that aims to group the studied entities into a smaller number of clusters. It starts with a data set containing information about a sample of entities and attempts to reorganise these entities so that the entities within each cluster would be relatively homogeneous and distinct as possible from entities in other clusters (Aldenderfer, Blashfield, 1984). The hierarchical cluster analysis was selected for the analysis. Hierarchical clustering aims to group the studied entities into a hierarchical set of clusters. In the present analysis, the entities studied are 48 rural municipalities of four Western Estonian counties.

The following economic and social indicators were used in the grouping of the municipalities: population of the municipality in 2010; change of population from 2006 to 2010 (%); entrepreneurial activity rate per 1000 inhabitants in 2006 and 2010; share of primary sector, secondary sector

and tertiary sector enterprises in 2010 (%); average monthly gross income by employee in 2006 and 2010 (euros); and share of sole proprietors in 2006 and 2010 (%). The data are derived from the statistical database of Statistics Estonia (2011).

The selection of socio-economic variables for the analysis was affected by the availability of the statistical data on the municipal level that sets limits to the analysis. For example, the labour data on labour force participation and employment rate are not available on the municipal level, while they are available on the county level by the type of settlement: urban/rural. The statistical data on the average wages are published on the county level, but not on the municipal level; and therefore another indicator – average gross monthly income per employee was used in the analysis. This indicator is not calculated by Estonian Statistical Office but it is computed on the basis of the data from Estonian Tax and Customs Board using different methodology. The Board publishes no average wages but the remuneration paid to an employee in relation to the employment relationship (Statistics Estonia, 2010).

Another methodological delimitation that has to be taken into account is that of the quality of population registration data, especially in case of the small islands. In a 10-years period starting from the 1990s it was not obligatory to register the actual residence (Sjoberg, Tammaru, 1999). This resulted in under registration of migration data and some other distortions. In case of many rural municipalities, especially in case of the small islands, the population data tend to be elevated as the number of registered population may be higher than the actual permanent residents, because summer residents have registered themselves by the local municipality, but during the most of the year, they work and live in some other area. There are also people who have moved away, but have not changed their registration, although they already live elsewhere for the most of the year. This has to be taken into account analysing individual rural municipalities and one way is to analyse the groups of municipalities to minimise the effect of this kind of distortions in case of individual municipalities.

In the hierarchical analysis, the variables were standardised for the analysis and squared Euclidean distances were used for the computing the distances. The squared Euclidean distance between the objects and is calculated as follows:

$$distance(x, y) = \sum_i (x_i + y_i)^2 \quad (1)$$

Ward's method was chosen for clustering. Aldenderfer and Blashfield (1984) explain that the Ward's method aims to optimise the minimum variance within the cluster; the objective function is known as the error sum of squares (ESS), where x_i is the score of the y_i case.

$$ESS = x_i^2 - 1/n (\sum x_i)^2 \quad (2)$$

The method works by joining the groups that result in the minimum increase of the ESS (Aldenderfer, Blashfield, 1984, p. 43).

In the cluster analysis, different solution with different number of clusters was studied and it was decided to proceed with the three-cluster solution.

Table 1. Rural and urban population in the Western Estonian Counties

Region	Type of settlement	Local government units in 2010, number	Population in 2010, number	Share of Estonian population in 2010, %	Population in 2006, number	Population gain/loss from 2006 to 2010, %
Estonia	Total	226	1 340 127	100	1 344 684	-0.34
	Towns	33	866 842	64.7	866 907	-0.01
	Rural municipalities	193	473 285	35.3	477 777	-0.94
Hiiumaa	County total	5	10 032	0.75	10 222	-1.85
	Towns	1	3 634	0.27	3 724	-2.41
	Rural municipalities	4	6 398	0.47	6 498	-1.54
Lääne	County total	12	27 366	2.04	27 853	-1.75
	Towns	1	11 618	0.87	11 774	-1.32
	Rural municipalities	11	15 748	1.17	16 079	-2.05
Pärnu	County total	20	88 428	6.59	89 017	-0.66
	Towns	2	48 062	3.58	48 247	-0.38
	Rural municipalities	18	40 366	3.12	40 770	-0.99
Saaremaa	County total	16	34 644	2.58	35 076	-1.23
	Towns	1	14 977	1.11	14 919	0.38
	Rural municipalities	15	19 667	1.46	20 157	-2.43

Source: Statistics Estonia, 2011

Table 2. Labour force participation and employment rate in 2006 and 2010 in the Western Estonian counties

Region	Type of settlement	Labour force participation rate, %		Employment rate, %	
		2010	2006	2010	2006
Estonia	Total	66.4	65.5	55.2	61.6
	Towns	68.3	67.2	56.4	63.3
	Rural municipalities	62.0	61.5	52.4	57.7
Hiiumaa	Total	55.6	70.1	49.2	67.6
	Towns	57.7	69.6	51.6	69.6
	Rural municipalities	53.5	70.4	46.7	66.3
Lääne	Total	66.0	57.4	51.3	53.5
	Towns	70.5	64.7	56.6	60.0
	Rural municipalities	62.1	51.6	46.7	48.4
Pärnu	Total	62.2	58.6	53.4	56.5
	Towns	63.6	59.9	56.6	57.5
	Rural municipalities	59.8	56.4	47.7	54.8
Saaremaa	Total	60.7	56.4	55.1	54.6
	Towns	70.5	66.4	66.6	66.0
	Rural municipalities	53.3	50.8	46.3	48.2

Source: Statistics Estonia, 2011

Results

An overview of the Western Estonian counties

Before the results of the cluster analysis are presented, a short economic and social overview is given in order to compare the counties and their rural and urban municipalities.

In 2010, there were 5 towns and 48 rural municipalities in the four counties (Table 1). These four Western Estonian counties form 25.6% of Estonian area and as of 2010, have 11.96% of total Estonian population. The population of rural

municipalities of Western Estonia account for 6.22% of total Estonian population and 17.4% of Estonian rural population (Statistics Estonia, 2011). The population density of the Western Estonia has been lower than Estonian average rural population density. One reason for that are the geographical characteristics of the counties situated on the islands and isolated from the mainland of Estonia.

In the period of 2006-2010, the population in the area studied has continued its slight decrease and the decline has been somewhat higher than the Estonian average and in most cases has concentrated more into rural municipalities.

Table 3. Unemployment rate and average monthly gross wages in the Western Estonian counties

Region	Unemployment rate, %	Average monthly gross wages, euros		Share of Estonian average wage, %	
	2010	2010	2006	2010	2006
Estonia	16.9	792.3	601.2	100	100
Hiiu county	11.5	629.1	475.1	79.4	79.0
Laane county	22.3	655.4	460.2	82.7	76.5
Parnu county	14.2	693.8	508.0	87.6	84.5
Saare county	9.3	646.8	505.9	81.6	84.2

Source: Statistics Estonia, 2011

Table 4. Number of enterprises and entrepreneurial activity rate per 1000 inhabitants in the Western Estonian counties

Region	Type of settlement	Enterprises, number		Share of Estonia enterprises, %		Entrepreneurial activity rate per 1000 inhabitants	
		2010	2006	2010	2006	2010	2006
Estonia	Total	100216	71012	100	100	74.8	52.8
	Towns	66517	48589	66.4	68.4	76.7	56.0
	Rural municipalities	33699	22423	33.6	31.6	71.2	46.9
Hiiu	Total	834	603	0.8	0.8	83.1	59.0
	Towns	294	206	0.3	0.3	80.9	55.3
	Rural municipalities	540	397	0.5	0.6	84.4	61.1
Laane	Total	1886	1302	1.9	1.8	68.9	46.7
	Towns	686	454	0.7	0.6	59.0	38.6
	Rural municipalities	1200	848	1.2	1.2	76.2	52.7
Parnu	Total	6530	4733	6.5	6.7	73.8	53.2
	Towns	3508	2558	3.5	3.6	73.0	53.0
	Rural municipalities	3022	2175	3.0	3.1	74.9	53.3
Saare	Total	2776	1950	2.8	2.7	80.1	55.6
	Towns	1151	818	1.1	1.2	76.9	54.8
	Rural municipalities	1625	1132	1.6	1.6	82.6	56.2

Source: Statistics Estonia, 2011

Table 5. Share of microenterprises and sole proprietors in the enterprises of the Western Estonian counties

Region	Type of settlement	Share of microenterprises, %		Share of sole proprietors, %	
		2010	2006	2010	2006
Estonia	Total	93.2	88.2	31.3	20.3
	Towns	92.4	86.8	24.0	9.9
	Rural municipalities	94.9	91.1	45.8	42.9
Hiiumaa	Total	95.6	93.0	54.1	47.3
	Towns	92.9	89.8	40.1	21.8
	Rural municipalities	97.0	94.7	61.7	60.5
Lääne	Total	94.6	89.7	50.7	42.7
	Towns	93.3	86.8	39.2	18.1
	Rural municipalities	95.4	91.3	57.3	55.9
Pärnu	Total	94.4	89.5	43.2	34.0
	Towns	93.3	86.7	33.8	18.8
	Rural municipalities	95.7	92.7	54.1	51.8
Saaremaa	Total	94.4	90.8	52.8	44.1
	Towns	91.7	86.7	36.0	19.8
	Rural municipalities	96.3	93.8	64.7	61.6

Source: Statistics Estonia, 2011

The persisting lower labour force participation rate (share of labour force in the working age population) and employment rate (share of employed in the working age population) of the rural areas are among the socio-economic challenges of Estonian regional development. As the data in Table 2 illustrates, the labour force participation and employment rate in the rural municipalities of the four counties have remained lower than the national average in most cases. Especially problematic is the issue of employment rate that by 2010 has dropped under 50% in all the rural municipalities of the counties studied.

In 2006, Estonia was experiencing the economic growth and the overall unemployment rate in Estonia was 5.9% (Statistics Estonia, 2011). However, as the statistical data on the unemployment are not available on the county level for 2006, Table 3 presents the unemployment rate only for the year 2010. As in 2008 the economic recession started in Estonia bringing along fast increase in unemployment, by 2010 the national unemployment rate was 16.9%, having hit Lääne and Pärnu counties considerably harder (Table 3). However, the average wage level in those areas was higher indicating that the onset of recession has wiped the lower paid jobs first.

The statistical data on the average wages are not available for the local government level; Table 3 presents them on the county level. The wages in the counties studied consistently have been considerably lower than the Estonian average, especially it is a problem on the islands of Saare County and

Hiiumaa County, where in 2010, the average monthly gross wage was 81.6% and 79.4% of the Estonian average; besides the increase in average wage has been stagnant or non-existent in the period studied. The nearness of the larger town of Pärnu has provided better paid job opportunities for the residents of Pärnu County.

In the recent years, the number of enterprises in Estonia has been on increase, since the number of economically active enterprises (companies and sole proprietors) has grown from 71012 in 2006 to 100216 in 2010 (Statistics Estonia, 2011). In 2010, totally 12% of all Estonian enterprises and 18.9% of Estonian rural enterprises were located in the Western Estonian counties (Table 4).

One characteristic feature of the area studied is that the entrepreneurial activity rate in rural municipalities of the four counties has been higher than in the towns and in case of the two counties on the islands – Hiiumaa and Saare County, it has been higher than the national average. This has been explained by the high share of sole proprietors, since due to the lack of other employment opportunities on the islands, the people are more likely to be forced to become sole proprietors. The share of microenterprises with less than 10 employees has been higher than average in the rural municipalities studied (Table 5).

In Estonia, the share of tertiary sector enterprises has been on the increase, reaching 70.2% of all enterprises in 2010 (Table 6). The share of primary sector enterprises has continued its decrease. The same kind of decrease has taken

Table 6. Enterprises according to the economic sector in the Western Estonian counties, %

Region	Type of settlement	Share of enterprises, %					
		2010			2006		
		Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Estonia	Total	12.5	17.3	70.2	14.2	19.5	66.3
	Towns	2.3	17.1	80.6	2.0	20.4	77.6
	Rural municipalities	32.8	17.7	49.6	40.9	17.5	41.6
Hiiumaa	Total	33.9	17.3	48.8	40.6	16.6	42.8
	Towns	17.3	20.1	62.6	18.4	23.8	57.8
	Rural municipalities	43.0	15.7	41.3	52.1	12.8	35.0
Läänemaa	Total	30.6	17.2	52.2	37.2	17.4	45.4
	Towns	8.2	20.0	71.9	8.6	24.9	66.5
	Rural municipalities	43.4	15.7	40.9	52.5	13.4	34.1
Pärnumaa	Total	22.3	18.5	59.3	25.5	18.8	55.7
	Towns	5.3	19.3	75.4	6.4	21.8	71.9
	Rural municipalities	42.0	17.5	40.6	48.0	15.4	36.6
Saaremaa	Total	32.2	18.0	49.8	38.1	16.4	45.5
	Towns	6.2	20.7	73.2	9.2	19.9	70.9
	Rural municipalities	50.6	16.1	33.3	58.9	13.9	27.2

Source: Statistics Estonia, 2011

place in the four counties studied; however, the share of primary sector enterprises has still remained higher than in Estonian rural municipalities on average. The share of tertiary sector enterprises in the towns of the four counties is higher than Estonian overall average, but somewhat lower than the average of Estonia towns in 2010. It may be associated with the tourism industry, because the western coast of Estonia and the islands are major tourism destination.

Results of the cluster analysis

A cluster analysis of the rural municipalities of the four counties was conducted to study the possibilities for grouping the municipalities based on their entrepreneurial activity rate and other economic data. Hierarchical cluster analysis was selected for the grouping of municipalities. Solutions with the different numbers of clusters were studied and the three cluster solution for the grouping of rural municipalities was chosen in the research. In this solution, forty-eight municipalities in the analysis were divided as follows: Cluster 1 consisted of 23 municipalities; Cluster 2 had 10, and Cluster 3 included 15 municipalities (Figure 2, Table 7). One way to characterise these three clusters is to provide their characteristics based on the entrepreneurial activity rate: higher than the average, average entrepreneurial activity, and lower than the average activity.

Cluster 1 consists mostly of the rural municipalities on the islands and of the Northern part of Läänemaa County in the mainland. It contains the municipalities that are smaller

population wise. Both smallest rural municipalities in this group are those on separate islands: Ruhnu Island with 72 inhabitants and Vormsi Island with 245 inhabitants in 2010. The entrepreneurial activity rate per 1000 inhabitants is higher than the average. The share of primary sector enterprises, and secondary sector enterprises and sole proprietors is close to the overall average and lower than in case of Cluster 2. In 2006 and 2010, the average monthly gross income was higher than in other clusters.

Cluster 2 consists of municipalities that mostly have between 1000 and 2000 inhabitants. In comparison with other groups, however, their population loss has been higher in the 5-years period (Table 8). Cluster 2 is characterised by considerably higher share of sole proprietors and higher share of primary sector enterprises than other clusters or overall in Estonian rural municipalities. The share of secondary sector and tertiary sector enterprises is lower than the average and the average monthly gross income per employee is also considerably lower.

Cluster 3 contains the rural municipalities with the highest population on average. The overall population loss has been smaller than in the other clusters. This can be explained also by the fact that most of the municipalities in this cluster are surrounding or located near the towns in the three counties studied. In case of Pärnumaa County, some of them also include a town without a municipal status. This administrative division has been a result of the ongoing attempt for administrative reform in Estonia, since in 2005, many of smaller rural municipalities and small towns were merged together to form

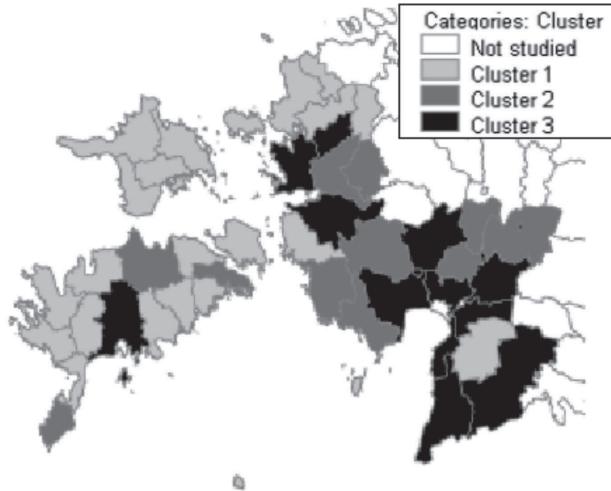


Figure 2. Rural municipalities by the clusters

Table 7. Local rural municipalities in the counties studied by the cluster

Clusters		
1	2	3
Emmaste	Are	Audru
Hanila	Koonga	Halinga
Kihelkonna	Kullamaa	Haademeeste
Kihnu	Leisi	Kaarma
Korgessaare	Martna	Lavassaare
Kaina	Poide	Lihula
Karla	Torgu	Paikuse
Laimjala	Tostamaa	Ridala
Lumanda	Varbla	Saarde
Muhu	Vandra	Sauga
Mustjala		Taebla
Noarootsi		Tahkuranna
Nova		Tootsi
Orissaare		Tori
Oru		Vandra town
Pihla		
Puhalepa		
Risti		
Ruhnu		
Salme		
Surju		
Valjala		
Vormsi		

Table 8. Average values for the four groups of municipalities

	Clusters			
	1	2	3	Total
Number of rural municipalities	23	10	15	48
Population in 2010	1092.7	1390.9	2875.9	1712.1
Change in population from 2006 to 2010; %	-2.3	-2.9	-1.0	-2.0
Entrepreneurial activity rate per 1000 inhabitants in 2006	64.7	63.8	47.3	59.1
Entrepreneurial activity rate per 1000 inhabitants in 2010	96.1	81.9	66.3	83.8
Share of primary enterprises in 2010; %	49.0	65.3	31.9	47.0
Share of secondary sector enterprises in 2010; %	14.3	9.0	19.4	14.8
Share of tertiary sector enterprises in 2010; %	36.8	25.8	48.7	38.2
Average monthly gross income per employee in 2006; euros	542.2	479.6	524.3	523.6
Average monthly gross income per employee in 2010; euros	719.1	653.9	681.9	693.9
Share of sole proprietors in 2006; %	61.9	75.7	40.1	58.0
Share of sole proprietors in 2010; %	64.7	71.7	46.0	60.3

larger rural municipalities and those small rural towns lost their municipal status as separate administrative units and local governments. The overall entrepreneurial activity rate is lower than in other clusters. The secondary sector and tertiary sector enterprises play a key role in the economy and the share of sole proprietors among the enterprises is considerably lower. The infrastructure and nearness of larger centres and labour provide better access to market and more favourable conditions for the development of tertiary and secondary sector enterprises.

Conclusions

The research aim was to study the entrepreneurial activity of local rural municipalities in the Western Estonian counties. A cluster analysis was chosen to group the municipalities based on the selected entrepreneurial and socio-economic indicators. The availability of data on municipal level and the acknowledged issues with the reliability of some of the population data in Estonia, especially in case of the small islands, sets limits to the comparison of individual rural municipalities. Besides those delimitations, the approach adopted in the present research is relatively simplistic — the grouping of municipalities based on their entrepreneurial activity and selected socio-economic indicators. However, the grouping of municipalities and the study of characteristics of those groups do provide useful information on the development and regional discrepancies of the area studied. The topic is relevant as there is a heavy discussion going on in Estonian society on the necessity of exhaustive regional administrative reform that would considerably reduce the number of rural municipalities. Another topic has been the overall entrepreneurial activity in Estonia that gained relevance especially since the onset of economic recession, since the establishment of new enterprises has been seen as one way out of the recession and unemployment.

The three clusters retrieved in the analysis can be distinguished by their entrepreneurial activity, entrepreneurial diversity (share of enterprises of different sectors), socio-economic indicators and population statistics. The municipalities on the islands have more in common, however, those in the counties of the mainland of Estonia may be located in relative proximity, but there are some considerable differences between them.

The average gross income and entrepreneurial activity rate were higher in case of the municipalities in the islands. In case of the municipalities on the islands, however, there is the aforementioned issue with the elevated population numbers. But still the isolation of the islands can be regarded as one of the “push” factors that forces people to establish their own company or to become sole proprietor.

The municipalities with larger population and in more favourable distance from local towns are characterised by lower entrepreneurial activity rate, but it does not manifest itself in lower incomes or in a larger than the average population loss as their economy is more diverse. The key is the higher diversity of enterprises. The group of municipalities with highest share of sole proprietors and primary sector enterprises had the lowest gross average income per employee. The wage level in agriculture in Estonia has been constantly one of the lowest of all the economic activities in the past 20 years, so it can be expected that the high share of agricultural enterprises comes with low level of gross income of employees. So the non-agricultural jobs and economic diversity has to remain one the main goals for the development of rural municipalities. The results of this analysis confirm that of several other studies, the rural municipalities with the more viable tertiary and secondary sector enterprises and with access to infrastructure and nearness of larger centre, have been better off as their population loss has been smaller and incomes of locals higher.

The high entrepreneurial activity rate by itself does not necessarily translate to higher incomes as the choice to become

an entrepreneur may often be a forced one, because of the lack of other alternatives in an isolated region as an island. So the high number of enterprises in itself should not be an economic developmental goal.

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ORIGINAL PUBLICATIONS

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**ESTONIAN RURAL AND URBAN ENTERPRISES' INVESTMENTS IN FIXED
ASSETS AND CHANGES IN SALES REVENUE FROM 2005 TO 2010**

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Abstract. The aim of research is to study the investments and sales revenue of Estonian rural and urban enterprises in the period of 2005- 2010 during which Estonia went through high economic growth followed by a deep decline and first signs of economic recovery in 2010. The analysis is based on financial data of economically active enterprises collected by the Statistical Office of Estonia. The average investment in fixed assets and average sales revenue per urban and rural enterprise is compared in the analysis. The results show that while the number of economically active enterprises increased in more rapid pace in Estonian rural areas, it is highly problematic that their average annual investment and sales revenue remains considerably lower than that in their urban counterparts. For Estonian rural enterprises, both those indicators grew slower during the economic boom years of 2005 to 2007 and decreased more rapidly in the decline years of 2008 and 2009; thus, widening the gap with the urban enterprises. The weak recovery of enterprise investments remains a considerable problem for further growth.

Key words: Estonia, rural enterprises, urban enterprises, investments, sales revenue.

JEL code: R10

Introduction

The economic climate of the recent years has been a considerable challenge for all Baltic States. Estonia is one of the countries that went through an extreme cycle of high growth up to 2007 (OECD, 2011) characterised by overheating together with high inflation (OECD, 2012); followed by precipitous decline in 2008 and 2009 that was accompanied by high structural unemployment and substantial decline in domestic demand (OECD, 2011). The recession ended in the first half of 2010, when the economy started to grow more rapidly; however, the Estonian economic recovery in the recent years has been highly volatile (OECD, 2012) and challenging to both urban and rural enterprises in Estonia. The rural areas have been affected by ongoing economic restructuring as the weight of agriculture as provider of rural jobs and driver of rural economy is low and continues to decline (OECD, 2006). In Estonia, the tertiary sector has become the main provider of rural jobs and new enterprise growth (Sakk O. et al., 2013) as the number of tertiary sector rural enterprises passed the number of primary sector enterprises in 2007 (SOE, 2013). One of the consequences of those changes has been high vulnerability of rural enterprises to the sharp decline in domestic demand starting in 2007, as with the onset of the recession and high unemployment, the customers were first to cut back on the consumption of services.

In the present economic climate in Europe, the high emphasis is being placed on the development of measures that should lead to the economic recovery and revival (Carballo-Cruz F., 2011; Stamatovica M., Zakic N., 2010; World Bank, 2011). Besides the overall impact of economic climate, the rural and urban

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enterprises face their own distinctive set of challenges arising from their location, population and enterprise density, and regional development characteristics. The typical problems of rural enterprises include their distance from markets and suppliers (Smallbone D. et al., 2003; Besser T.L., Miller N.J., 2013), small and specialised economies (Rizov M., 2006), and lack of economies of scale and agglomeration effect (Besser T.L., Miller N.J., 2013) etc. Due to both differences in industry composition and productivity, rural industries often lag behind their urban counterparts (Rizov M., Walsh P.P., 2011). The urban enterprises are often bigger, have better access to educated labour, and are more likely operating in high growth sectors (Yu L. et al, 2011). While many factors work in favour of urban enterprises, several studies indicate that rural enterprises may have better survival chances, as the company survival rates decline with the increased population density (Fritsch M. et al, 2006); start-up companies are likely to grow more rapidly in the most rural labour markets (Acs Z., Malecki E., 2003). The smallness of rural enterprises can also work in their favour, e.g. as in economic downturn small rural businesses that had more difficulties with finding external financing, were also less dependent on external financing (Andersen A.R. et al., 2010).

In Estonia, the high regional disparities that appeared during the transition process in the 1990s have persisted and the regional economic development continued to be strongly polarised to the territory around the Estonian capital Tallinn (Venesaar U., 2006). As the Estonian government has set the goal to curb the concentration of population as well as economic activity in the capital region (Servinski M., 2010), the regional aspect of enterprise development is a considerably important topic.

The present paper focuses on the research question of what type of impact the onset of economic recession had on the investments of Estonian urban and rural enterprises, and on their sales revenue. After the EU accession boosted the Estonian economic growth, the borrowing in euro became cheap (OECD, 2012). However, after the onset of crisis, the availability of external financing became more restricted. As the investments of enterprises are important drivers of economy and regional development, the impact of recession on the investment behaviour of urban and rural enterprises is a highly relevant topic. Also, as the onset of recession in Estonia was characterised by sharp collapse of domestic demand, its impact on the sales revenue of urban and rural enterprises requires attention.

The aim of the present research is to study the investments and sales revenue of Estonian rural and urban enterprises. The financial data of Estonian enterprises studied in the present research is from 2005 to 2010, during which Estonia went through high economic growth following the EU accession, then a steep economic decline in 2008 and 2009, and a slow recovery starting in 2010.

In the present research, rural enterprise is defined as an enterprise registered in Estonian rural municipality or in a town with less than 4000 inhabitants. Urban enterprises are registered in urban municipalities with more than 4000 inhabitants. The urban-rural definition corresponds to that of the Estonian Rural Development Programme 2007- 2013 (EMA, 2008). The data used in the analysis were collected for the survey "The Rural Enterprises' Situation, Development Trends and Need for Support" (Institute of Economics ..., 2012) that was financed by the Estonian Ministry of Agriculture from the resources of Estonian Rural Development Programme. In the survey, an outtake of financial data of rural enterprises was ordered from the Estonian Statistical Office's database of enterprises' financial indicators. The database is based on the financial indicators collected from the public and private limited companies, general or limited partnerships, commercial associations, and branches of foreign companies that are economically active (i.e. had expenditures, net sales etc.) in the reference period (SOE, 2013). The data

do not include the financial data of sole proprietors and enterprises in the field of financial intermediation (banks, insurance etc.). The research focuses on two main indicators: enterprises investments in fixed assets and annual sales revenue. The data on sales revenue includes income from sale of all products, goods and services; it excludes VAT and excises, subsidies. The total investments into fixed assets (the cost of buildings, land, equipment, machinery, vehicles, installations, construction, reconstruction, intangible fixed assets, investment properties etc.) are analysed (SOE, 2013) for the study of investment behaviour. On the basis of the financial data, the average indicators are calculated for the urban and rural enterprises. The following methods have been used: descriptive method, analysis and synthesis, and graphical analysis.

The paper has set the following research tasks: to study the changes in the number of economically active enterprises from 2005 to 2010; to calculate the average investment in fixed assets in urban and rural enterprises; and to compare the changes in average sales revenue in Estonian urban and rural enterprises from 2005 to 2010.

One of the delimitations of the present analysis is the availability of data. At the time of the analysis in 2013, the last full year for which regional data were available was 2010. As Estonian enterprises prepare their annual reports 6 months after the end of fiscal year, there is a two year time delay in the availability of more specific financial data. The analysis does not take into account either the regional diversity of enterprises as there are also considerable regional differences between rural regions themselves. Another limitation is that while in Estonian rural areas the share of sole proprietors is higher among the enterprises, the present data do not include data from sole proprietors as they have different financial statement forms. The financial data of enterprises provided in the Estonian Statistical Office's database are available on Estonian county level (15 counties) without division to more specific urban and rural dimension. Part of the novelty of the present research is that there have not been urban and rural comparisons of Estonian enterprise' performance, and thus, in the survey a more specific special outtake of urban and rural enterprises was ordered from Estonian Statistical Office.

Research results

In 2005, there were 9489 economically active enterprises registered in Estonian rural municipalities and towns with less than 4000 inhabitants (SOE, 2013). They accounted for 22.5% of all economically active enterprises in Estonia. The three years following EU accession in 2004 were characterised by high economic growth during which the number of active enterprises also increased rapidly (Table 1). In urban areas, the number of active enterprises increased by 10% annually from 2005 to 2007, while in rural areas the rate was even higher. The total number of economically active rural enterprises increased by 19.3% from 2005 to 2006. The increase in the number of rural enterprises was 16% from 2006 to 2007. In 2007, with the first signs of economic slowdown, the number of enterprises continued to increase more slowly. The number of active urban enterprises actually decreased by 0.3% from 2008 to 2009 with the onset of recession; however, the number increased by 3.9% in rural areas. By 2010, the number of active enterprises in Estonia was 58 347 (Table 1). As the number of economically active enterprises grew more rapidly in rural areas, the share of rural enterprises had increased to 28.7% by 2010, while enterprises registered in urban areas accounted for 71.3% of all economically active enterprises.

Table 1

Economically active enterprises in Estonia 2005- 2010

	2005	2006	2007	2008	2009	2010
Urban	32 736	36 190	39 882	40 853	40 717	41 612
Rural	9 489	11 317	13 130	14 800	15 378	16 735
Total	42 225	47 507	53 012	55 653	56 095	58 347

Source: authors' calculations based on the SOE, 2012

The years 2005 to 2007 were characterised by rapid growth in both investments in fixed assets and the sales revenue of enterprises (Table 2). The investments peaked in 2007 with 4.29 billion – a 57.1% increase in comparison with the year 2005. However, in 2008, the volume of investments started a sharp decline. Despite the first signs of economic recovery in 2010, the economically active enterprises' annual investments in fixed assets in 2010 were still considerably lower than the level of investments of 2005. The decline in the total sales revenue reported by the enterprises was not so steep in 2008 and 2009, and in 2010 it exceeded the level of 2006.

Table 2

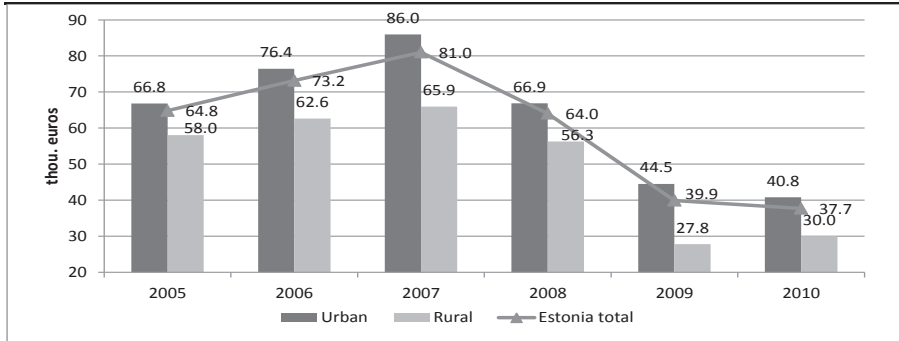
Annual investments in fixed assets and sales revenue of Estonian economically active enterprises from 2005 to 2010 (billion of EUR)

	2005	2006	2007	2008	2009	2010
Investments in fixed assets	2.73	3.47	4.29	3.56	2.24	2.20
Sales revenue	31.36	37.50	44.52	44.46	33.71	37.98

Source: SOE, 2013

The average annual investment in fixed assets per economically active Estonian enterprise (Figure 1) has been consistently lower in rural areas. In 2005, the average investment made by a rural enterprise was EUR 58 000 – around 13% lower than in an urban enterprise in case of which the annual average investment in fixed assets was EUR 66 800. From 2005 to 2007, the investments made by urban enterprises grew more rapidly, and in 2007, the average investment in fixed assets by a rural enterprise was 25% lower than in an urban enterprise. Investments of rural enterprises decreased also more than in urban enterprises. In 2009, rural enterprises invested less than half of what they had invested in the previous year as the average annual investment per rural enterprise was just EUR 27 800 in comparison with EUR 56 300 per enterprise the year before. In urban enterprises, the investments dropped by third as the average investment per enterprise was EUR 44 500 in 2009 (Figure 1). However, in 2010, the average investment per rural enterprise started to increase, while the indicator continued to decrease in case of urban enterprises. Still the annual average investment in a rural enterprise was 26.5% lower than the average investment in an urban enterprise in 2010. The overall decrease in the investments in the period was higher in case of rural enterprises as the average investment in rural enterprises in 2010 was 48% lower than it had been in 2005. In case of urban enterprises, the average investment per enterprise was by 39% lower than in 2005.

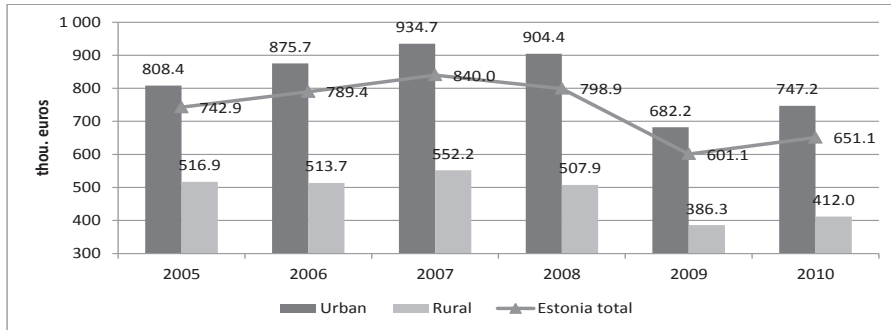
ESTONIAN RURAL AND URBAN ENTERPRISES' INVESTMENTS IN FIXED ASSETS AND CHANGES IN SALES REVENUE FROM 2005 TO 2010



Source: authors' calculations based on the SOE, 2012

Fig. 1. Average investment in fixed assets per economically active enterprise

In 2005, the sales revenue of a rural enterprise was lower than in urban enterprises by a third – the average indicator per economically active enterprises was EUR 516 900 in rural areas and EUR 808 400 per urban enterprise (Figure 2). In the economic growth years of 2006 and 2007, the sales revenue increased more rapidly, and in 2008 and 2009, it decreased less in urban enterprises.



Source: authors' calculations based on the SOE, 2012

Fig. 2. Average sales revenue per economically active enterprise

In 2010, the average sales revenue per rural enterprise was 55% of the average on an urban enterprise. The sales revenue of enterprises recovered from recession more quickly than the investments. The period studied coincided with high inflation in Estonia (Eesti Pank, 2012). The comparison of the average indicators for the years 2005 and 2010 shows that in 2010, the average sales revenue per urban enterprise was 92% of the 2005 level and in case of rural enterprises the indicator was 80% of the level of 2005.

Conclusions

The paper studied the impact of economic recession on the investments and sales revenue of Estonian rural and urban enterprises in the period of 2005-2010.

1. In Estonia, the rural areas were characterised by higher enterprise growth numbers both in the economic boom years following the EU accession and in the years 2008 and 2009 during which Estonian economy went through a steep decline. As the number of economically active enterprises grew more rapidly in rural areas, the share of rural enterprises in the total number of economically active enterprises continued to increase rapidly reaching 29% by 2010 from 22.5% in 2005. However, a limitation of the present analysis is that the regional allocation of the enterprise growth has not been taken into account.
2. The total sales revenue of Estonian enterprises showed signs of recovery in 2010. It can be attributed to recovery in domestic demand but also high inflation. The overall decline in 2008- 2009 was lower in comparison with investment figures.
3. In the situation of high economic volatility, the lack of investments poses a serious problem. Estonia officially exited recession in 2010; however, the total volume of enterprises' investments in fixed assets remained lower than in the previous years. The investments in 2010 were still lower the 2005 level, and almost just half of the volume of investments carried out in 2007.
4. Despite the higher increase in the number of enterprises, another problem for Estonian rural areas is the gap in their ability to invest in comparison with urban enterprises. The average annual investment per rural enterprise was 26.5% lower in 2010 than in urban enterprises. In the economic growth years, the average investments made by urban enterprises grew more rapidly and in the economic decline years, they decreased slower than in rural enterprises increasing the urban-rural gap.
5. The drop in the sales revenue per enterprise was slower and recovered more quickly in 2010. Rural enterprises typically face the challenge of longer distances from markets, customers (Smallbone D. et al, 2003; Besser T.L., Miller N.J., 2013). In Estonian case, the characteristic of rural enterprises was also the considerably lower average sales revenue, and the gap between the urban and rural enterprises continued to increase in the period studied.
6. One of the limitations of the present analysis was the time period for which the specific data were available. In the future research, it would be important to continue with the study of how the economic climate of 2011 and 2012 continued to affect the investments of urban and rural enterprises and their sales revenue. In 2010, in the last year in the analysis, Estonian economy showed signs of recovery; however, with the volume of investments made by enterprises still lower than the pre-recession level, it would be important to analyse if this indicator showed signs of recovery and if the gap between urban and rural enterprises continued to decrease or increase.

Acknowledgement

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ORIGINAL PUBLICATIONS

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Firm entries and exits in Estonian urban municipalities: urban hinterlands and rural peripheries, 2005–2012

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ABSTRACT

This paper studies firm entries and exits in Estonian urban areas, urban hinterlands, and rural peripheries following EU accession, and it analyzes the effects of changes in population density, employee income level, unemployment, and economic climate on firm entries and exits. It concludes that the firm entry rate exceeded the exit rate in all of the years between 2005 and 2012. The urban hinterland is characterized by the highest level of both entries and exits. The fixed-effect regression models show that income and recession, which are the most significant factors to impact on local entrepreneurship, have a similar effect on different municipality types.

KEYWORDS Entrepreneurship; Estonia; firm entries; firm exits; fixed-effect model; panel data

Introduction

Entrepreneurship is often discussed as one of the key engines for economic growth (Audretsch and Keilbach 2004; Bosma and Schutjens 2007; Tominc and Rebernik 2007; Minniti 2008). One of the main reasons for research and political interest in entrepreneurship and its connection to regional development is that entrepreneurship is regarded as the main provider of jobs and a source of prosperity, competitiveness, and innovation. Hence, entrepreneurship is seen as a way to address lagging development, regional disparities, and persistent unemployment. Therefore, the promotion of entrepreneurship has become a priority policy across the international system (Barreneche-Garcia 2014; Westlund, Larsson, and Rader Olsson 2014).

Smallbone, North, and Kalantaridis (1999) emphasize that the survival and development of any enterprise depends both on its internal characteristics and its ability to adapt to external environmental conditions, which can be analyzed at different spatial scales (global, national, regional, local, etc.). Sternberg (2009) suggests that entrepreneurship is primarily a regional or local phenomenon as it can be argued that regional or local conditions are more relevant for the development of entrepreneurship. Because of the regional and local conditionality of entrepreneurship, analyses of subnational spatial units (regions, localities) seem to provide a more effective understanding of the external factors that affect entrepreneurship. Considerable and persistent differences in entrepreneurial activities across regions have been well recorded in research literature (Storey 1984; Mason 1991; Reynolds, Storey, and Westhead 1994;

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Sternberg 2009; Bosma and Sternberg 2014; Brixy 2014; etc.), thereby prompting interest in the regional context of entrepreneurship.

While the Central and Eastern European Countries (CEECs) have been exposed to the same globalization and technological changes as western Europe in recent decades, the CEECs have had to deal with the lingering effects of the transition from command to market economies. The turbulent external environment and uncertain and rapidly changing institutional frameworks posed additional challenges to the development of entrepreneurship (Smallbone and Welter 2001, 2006; Welter and Smallbone 2011). However, this turbulent and uncertain environment also opened up new opportunities as limited competition and little governmental regulation at the beginning of the transition to a market economy encouraged entrepreneurship (Aidis 2003). Estonia is considered an example of a successful transition that was characterized by the implementation of a very liberal market philosophy, ambitious privatization, and encouragement of foreign investments in the 1990s (Smallbone and Welter 2009; Elenurm, et al. 2014). However, this success was only felt in some regions of Estonia. As in a number of other transition countries, rural areas and the rural population were generally considered the losers in the transition process (Buchenrieder, Hanf, and Pieniadz 2009). While the role of agriculture in the rural economy has been in steady decline (Daalhuizen, Van Dam, and Goetgeluk 2003; OECD 2006) in transition countries – in comparison with western Europe, where the importance of agriculture has been decreasing more gradually over the last several decades – agriculture still had a more substantial position in the rural economy at the beginning of the transition (Csaki 2008; Buchenrieder and Möllers 2011). Therefore, agricultural restructuring and the quick decline in agricultural jobs left rural areas struggling with considerable rural poverty and income inequality (Alanen 2004; Buchenrieder and Möllers 2011; Viira, Pöder, and Värnik 2009). In most of the rural areas, very few nonagricultural jobs appeared that could absorb the labor lost in agriculture (Blešić, et al. 2014). During the Soviet period, a significant part of rural infrastructure and rural services was provided by collective farms (Herslund and Sørensen 2004; Alanen 2004; Nikula 2004; Viira, Pöder, and Värnik 2009). Many of these jobs connected with rural services and infrastructure disappeared altogether during the liquidation of collective farms. While it was recognized that the development of rural entrepreneurship was critical to ameliorate the situation, the disappearance of local jobs, low rural incomes, high rural poverty, and decreased local consumer demand for goods and services did not provide a particularly favorable environment for rural entrepreneurship. Although the transition to a market economy has been completed, all the Baltic states have continued to struggle with unsolved economic, political, and social problems (Lauristin and Vihalemm 2009). Therefore, the fact that regions are continuing to develop at a different pace and how different factors affect their development remain relevant issues.

Labrianidis (2004) points out that the distinction between urban and rural has become increasingly blurred. A number of different approaches and criteria are used to define what it means to be 'rural' due to the changing and increasingly complex economic patterns and highly varied and heterogeneous rural areas. Smallbone (2009) discusses certain shared characteristics that are commonly used as a base for definitions, such as dependence on natural resources, low population density, and more. However, the thresholds for distinguishing between urban and rural, accessible or peripheral areas differ widely. Conventional models mainly use distance costs and a

lack of agglomeration advantages for defining peripherality (Copus 2001). With the variety of definitions used, both rural and peripheral have very different meanings in different countries. All the Baltic states are small and with low population density in comparison with western European countries. The majority of municipalities classified as urban by Estonia's administrative division are very small. For example, only five cities in Estonia had a population higher than 20,000 in 2015 (Statistics Estonia 2015). The distance to regional urban centers from some areas that could be classified as Estonian rural peripheries can be very short in comparison with peripheries in a number of Nordic or western European countries.

The primary aim of the article is to study if the differing effects of local factors cause different entrepreneurship development patterns in this kind of urban and rural context. Second, the study also seeks to examine whether or not entrepreneurship development patterns vary significantly between urban and rural areas. Third, the study examines how factors that affect entrepreneurship development in different urban and rural contexts compare with results from different studies conducted in western European countries, in which the rural and regional context has different meaning. This article compares firm entries and exits in Estonian urban areas, urban hinterlands, and rural peripheries in the period since EU accession, and it analyzes the effects of local development indicators and recession on firm entries and exits. Panel data from 226 Estonian municipalities for 2005–2012 are used in six fixed-effect regression models. The local indicators used are population density, income, and unemployment rate.

In Estonia, the effect of local development indicators on entrepreneurship in urban and rural areas has not been measured previously. The indicators for the analysis were selected from previous literature, while also taking into account socioeconomic developments that have had significant impact on regional development in Estonia. In the period of the study, all the Baltic states experienced significant economic growth followed by considerable decline as the relative impact of the economic crisis on GDP and employment was highest in the Baltic states (European Commission 2013). During the time period of the study, population continued to decline in Estonia; the impact of this decline in population on development is a very critical issue for Estonia.

This paper uses an approach similar to Nyström (2005), Westlund, Larsson, and Rader Olsson (2014), and Delfmann, et al. (2014) and conducts analysis on a local municipality level. Analysis on the lowest level of aggregation has problems; however, moving to a higher level of aggregation inevitably brings a loss of information. Using local municipalities also presents an opportunity to understand specific local characteristics (Delfmann, et al. 2014) and understand the effects of various national and regional programs for entrepreneurship that are produced in cooperation between several local governments (Westlund, Larsson, and Rader Olsson 2014). Estonian local governments also participate in designing regional strategies and programs to improve entrepreneurship and regional competitiveness, though these local governments have limited means to influence entrepreneurship directly. While a single local government unit usually has little direct influence on national policies, they still have 'an ear to the ground' and give feedback to regional and national institutions, which in turn set the goals of entrepreneurial policies. The local economic, social, and demographic developments, and their interaction with wider institutional and policy factors, as well as macroeconomic developments also set the stage for local entrepreneurship.

This paper is structured as follows. First, a literature overview on entrepreneurship and its regional context is provided. Next, the data and method are introduced, followed by sections containing the results, a discussion of the results, and concluding thoughts.

Entrepreneurship and its regional context

Entrepreneurship itself is a multidimensional concept (Westlund 2011). As different researchers use different definitions of entrepreneurship across different disciplines, there is no single, widely accepted definition of entrepreneurship (Hebert and Link 1989; Van Praag 1999; Reynolds, et al. 2005; Sternberg 2011). Shane and Venkataraman (2000) emphasize that the field of entrepreneurship is concerned with why, when, by whom, and how profitable opportunities to create goods and services are discovered, evaluated, and exploited. In defining entrepreneurship, the common emphasis is on 'newness' – entrepreneurs are innovators and founders of new businesses (Wennekers and Thurik 1999). However, entrepreneurship is not solely limited to the creation of new organizations as opportunities can also be pursued within existing through corporate entrepreneurship (Stevenson, Roberts, and Grousbeck 1989; Stevenson and Jarillo 1990; Wennekers and Thurik 1999; Shane and Venkataraman 2000).

A considerable body of research draws on Schumpeter's (1934, 1942) idea of creative destruction in which the economic structure is incessantly transformed by new enterprises introducing new combinations in the form of new goods and services, new markets, new production and transportation methods, and new forms of industrial organization, while destroying the old ones. Incumbent enterprises have to adapt to the new efficiency standard introduced by new entrants or exit the industry (Bosma, Stam, and Schutjens 2006). Entrants in the same sector and in the same region are most likely to present the highest competitive threat to incumbent enterprises (Bosma, Stam, and Schutjens 2011).

Empirically measuring entrepreneurship can be complicated as it is often difficult to translate theoretical concepts into empirically testable equivalents (Van Praag 1999). The majority of empirical studies use new business start-ups or self-employed persons to measure entrepreneurship (Westlund 2011). Often, firm exits are disregarded in analysis, even by studies that base their approach on Schumpeter's idea of creative destruction (Bosma, Stam, and Schutjens 2011). The exits of uncompetitive firms can be viewed as a part of the competitive process and as a crucial driver of competitiveness and economic growth (Bosma, Stam, and Schutjens 2006). The birth and death of firms facilitates the reallocation of resources to their most efficient use (Brown, Lambert, and Florax 2013).

Entrepreneurship obviously does not occur in a vacuum (Shane 2003). The opportunities offered and constraints set by the surrounding environment vary geographically and temporally (Bryant 1989). Regional attributes like institutions, infrastructure, capital, labor, location factors, and other enterprises influence the perception of the regional environment. At first, these attributes impact the decision to establish an enterprise and later affect the success of the enterprise (Sternberg 2011). While numerous factors affect entrepreneurship in a variety of ways, the focus of this study is limited to the effects of certain external factors – economic recession, population density, local incomes, and unemployment – on entrepreneurship in rural and urban areas.

Entrepreneurship in rural areas is typically associated with distinctive challenges, such as small and specialized economies (Rizov 2006), the distance from markets and suppliers, and difficulties with access to skilled labor and business infrastructure (Smallbone, et al. 2002; Smallbone, Baldock, and North 2003; Smallbone 2009; Siemens 2010; Anderson, Osseichuk, and Illingworth 2010; Besser and Miller 2013). In comparison, urban areas can build on positive agglomeration effects. The agglomeration of population and economic activities have a positive effect on enterprise entries because of better access to consumer markets; capital, labor, service, and input markets; cooperation opportunities, and knowledge spillovers from research institutions and other enterprises (Reynolds, Miller, and Maki 1995; Agrawal 2002; Werker and Athreye 2004; Fritsch and Mueller 2007). A more diverse population in dense areas also creates demand for a higher variety of products and services, thereby creating new and niche markets (Bosma, Van Stel, and Suddle 2008). Previous research (Dunne, Roberts, and Samuelson 1988; Bosma, Stam, and Schutjens 2011; Brown, Lambert, and Florax 2013) shows that the firm entry rate and exit rate are often positively correlated. This can be explained by both the positive and negative agglomeration effects being present at the same time. Negative agglomeration effects, for example, consist of a higher level of competition, including competition for labor, land, and inputs that push up costs for enterprises, environmental pollution, traffic congestion, etc. (Richardson 1995; Nyström 2005; Bosma, Van Stel, and Suddle 2008). Some of the previous research (Smallbone, North, and Kalantaridis 1999; Smallbone, Baldock, and North 2003; Yu, Orazem, and Jolly 2011) shows that rural areas can have higher business survival rates. With less competition in rural areas, rural firms can have better chances for long-term survival.

While the advantages of large, heterogeneous, and diversified economies usually outweigh the disadvantages (Bosma and Sternberg 2014), rural enterprises can find opportunities and survive in environments that lack those advantages. In his study of firm entries in the UK, Mason (1991) noted that many areas belonging to urban agglomerations had lower enterprise formation rates than semirural or rural counties, while some rural areas demonstrated particularly high formation rates of manufacturing firms. In studying rural enterprises in the UK in the 1980s, Vaessen and Keeble (1995) showed a relatively higher share of growth-orientated small- and medium-sized enterprises in peripheral areas in comparison with core regions, while North and Smallbone (1996) demonstrated that rural firms outperformed urban firms in terms of job creation. However, subsequent research by Smallbone, Baldock, and North (2003) revealed that the overall situation changed in England in the 1990s, with rural enterprises losing the dynamism of the previous decade and lagging behind in employment creation and innovation. Nevertheless, other studies (e.g. Vaessen and Keeble 1995; Smallbone, North, and Kalantaridis 1999; Bryden and Munro 2000) have demonstrated examples of enterprises that have found and implemented successful strategies to overcome the unfavorable environment of peripheral locations. Examples on how enterprises in peripheral areas adapt to their environment include the utilization of local unique resources and drawing upon the local community and family members to address the challenges associated with labor, infrastructure, and finance (Siemens 2010); proactive responses in the development of products and expansion to nonlocal markets; specialization in niche markets; and more labor-intensive practices to make use of lower labor costs (North and Smallbone 1996; Smallbone, North, and Kalantaridis 1999).

Numerous studies (e.g. Audretsch and Acs 1994; Mata 1996; Fritsch 2008; Audretsch and Pena-Legazkue 2012; Acs, et al. 2012; etc.) have linked economic growth with the new firm formation rates. The favorable state of the economy would improve the expected profitability of entries to the market, and thereby result in an increased number of entries seeking to capitalize on those opportunities (Ilmakunnas and Topi 1999). The unfavorable conditions of economic recession usually contribute to the high level of exits as recessions trigger and accelerate failures (Sauka and Welter 2014). However, new opportunities can also be created during a recession. Verheul, et al. (2001) point out that the impact of economic growth on entrepreneurship can be ambiguous. Furthermore, a number of other intermediate factors are affected by economic growth and influence entrepreneurship.

The growth of population and incomes expands the consumer market and creates a demand for new, diverse products and services, thereby promoting entries to the market (Armington and Acs 2002; Verheul, et al. 2002; Wennekers, et al. 2005). Incumbent enterprises, along with new entries, seek to capitalize on such opportunities. Start-ups are usually established where the entrepreneur lives or works because the new entrepreneur's personal networks are in the area, they have knowledge of the local market, and their access to financial capital is usually too limited to setup an enterprise outside of their local area (Stam 2007). Population increase also increases number of potential entrepreneurs; growing populations can put downward pressure on wages and thereby lower the opportunity costs for entrepreneurship (Verheul, et al. 2002), and making entrepreneurship a more attractive option than employment in a situation of stagnant wages. So, while increased income levels result in better access to capital and to a customer base with increasing purchasing power, they can also increase the opportunity costs for entrepreneurship (Verheul, et al. 2001; Bosma, Van Stel, and Suddle 2008). Entrepreneurs will exit business and become employees if they see that it is easier and less risky to earn higher income as employees. Therefore, on the one hand, population and income growth, indicating increased local consumer demand and a favorable business environment, should both increase firm entries and decrease firm exits; on the other hand, however, this also creates strong competition between firms and increasing opportunity costs for entrepreneurship, which can in turn result in a low level of entries and a higher number of exits.

Population decrease is commonly associated with rural areas and declining industrial regions, and it is usually expected to have a negative impact on firm formation. Entrepreneurship can be viewed as embedded in social structure (Bygrave and Minniti 2000). Over time, people develop local networks of professional contacts, friends, and acquaintances (Sorenson and Audia 2000). Local population decline not only erodes the local customer base, but also the size of the labor force, the local infrastructure, and public services and local networks. This is costly for enterprises as it takes both time and money to find a way to bridge the distance to former contacts or to find new contacts and create new networks. However, there are minimum-level goods and services required in regions, and opportunities for new activities may also emerge in regions with population decline (Delfmann, et al. 2014). Enterprises can also engage in different strategies (several are described by North and Smallbone 1996; Smallbone, North, and Kalantaridis 1999; Siemens 2010) to counter the problem of low local consumer demand and a small labor force.

The role of entrepreneurship as the creator of jobs has received considerable attention in research and politics. Empirical research on the effects of unemployment

shows an ambiguous impact on the entrepreneurship. Unemployment pushes people to entrepreneurship because of the lack of alternative opportunities and the relatively low opportunity costs (Storey 1991; Evans and Leighton 1990; Johnson and Parker 1996; Verheul, et al. 2001). However, unemployed people tend to possess lower endowments of human capital, entrepreneurial skills (Thurik, et al. 2008), and lower personal wealth (Johansson 2000). Janda, Rausser, and Strielkowski (2013) emphasize that persons lacking other employment alternatives often cannot become successful entrepreneurs. The lack of human capital combined with the challenging local environment in economically less developed regions means that the enterprises established by those persons are often doomed. High unemployment also indicates weak economic growth that, in turn, has a negative impact on new firm entries (Reynolds, Storey, and Westhead 1994; Carree 2002; Verheul, et al. 2002; Bosma, Van Stel, and Suddle 2008). The decrease of local demand forces firms to exit and, in turn, exiting firms contribute to the increase in unemployment.

Data and methods

In this study, firm entries and exits are used to measure entrepreneurship. The terms firm or enterprise entry, birth and start-up, and firm death and exit are respectively used interchangeably. The data used in this analysis are derived from the online statistical database of Statistics Estonia (2015). Based on the Eurostat methodology, the data of business demography on active enterprises, entries, and exits do not include enterprises engaged in agriculture. Firm entry refers to the creation of a combination of production factors with the restriction that no other enterprises are involved in the event. Only enterprises that become active after their registration (they have turnover and/or employees in the given year) are counted as births. Firm exit is defined as the dissolution of a combination of production factors with the restriction that no other enterprises are involved in the event; therefore, mergers, takeovers, and restructurings are excluded from the data (Statistics Estonia 2015).

The unit of analysis is the local municipality. Estonia is administratively divided into 15 counties, which in turn are divided into urban and rural municipalities. Between 2005 and 2012, there were 226 municipalities in Estonia, of which 33 were urban and 193 were rural. In order to study differences within rural regions, rural municipalities are divided into two types: urban hinterland and rural periphery. Over the years of this study, Statistics Estonia (2009) used the share of workforce commuting to the urban center to divide rural municipalities into urban hinterland and rural periphery in its publications on regional development. The urban hinterland is defined as areas with at least 30% of the commuting workforce. On the basis of this criterion, Estonian rural municipalities are divided into 48 urban hinterland municipalities and 145 rural periphery municipalities (Figure 1). The urban municipalities include 15 county centers and 18 smaller towns. The smaller towns, however, had little impact on their surrounding rural areas. Therefore, only areas around larger county centers meet the criteria for urban hinterland.

Approaches to calculating the start-up rate can be divided between the ecological approach and the labor market approach (Audretsch and Fritsch 1994; Armington and Acs 2002). In the ecological approach, firm entry or exit is based on the number of enterprises in an industry. The labor market approach studies the number of firms in relation to the labor force. The entry rate is conceptualized as the propensity of a

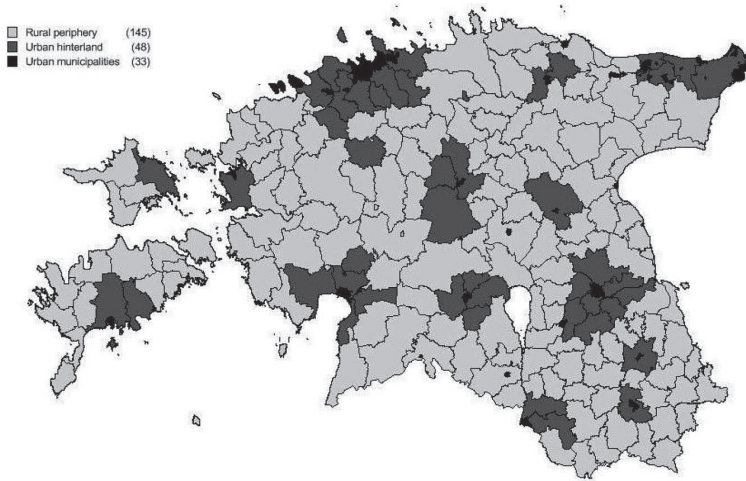


Figure 1. Map of municipality types.

member of the labor force to establish an enterprise (Fritsch 2008). This study uses the labor market approach. Enterprise entry and exits are therefore defined as newly born or dead enterprises per 1000 persons in the labor force of the municipality (Table 1).

The time period studied was selected in order to research the effects of the economic climate on firm entries and exits. Therefore, the years studied are divided into three time periods. In the years 2005–2007, the Estonian economy was booming, from 2008 to 2010 it was in recession, and in 2011 and 2012 it was slowly recovering.

In order to compare urban areas, urban hinterland, and rural periphery, a one-way analysis of variance is first conducted to compare the mean entry and exits rates for the whole period. As the sample sizes are unequal and the homogeneity of variance assumption is not met, the nonparametric Kruskal–Wallis test is used to study whether the differences were significant. Mann–Whitney tests are also used for the pairwise comparison of municipality types.

Table 1. Description of variables.

Variable	Definition	All municipalities (<i>N</i> = 226)	
		Mean	SD
<i>Entry rate</i>	Number of newly born enterprises per 1000 persons in the labor force	4.59	2.54
	<i>Entry rate in 2005–2007</i>	4.23	2.57
	<i>Entry rate in 2008–2010</i>	4.30	2.58
	<i>Entry rate in 2011–2012</i>	5.58	3.27
<i>Exit rate</i>	Number of dead enterprises per 1000 persons in the labor force	2.74	1.48
	<i>Exit rate in 2005–2007</i>	1.78	1.08
	<i>Exit rate in 2008–2010</i>	3.32	2.02
	<i>Exit rate in 2011–2012</i>	3.33	2.14
<i>Population density</i>	Population density (inhabitants per km ²)	158.3	395.3
<i>Income</i>	Average gross monthly income of an employee in the municipality (€)	652	83
<i>Unemployment</i>	Registered unemployment rate in the municipality (%)	4.47	1.60

In entrepreneurship research, endogeneity issues with omitted variables and simultaneity are common concerns. Omitted variables can often explain why only a fraction of regional variation of entrepreneurship is explained in empirical models (Parker 2009). Some issues with time-constant omitted variables can be addressed by using panel data and methods like fixed-effects estimation or first differencing (Wooldridge 2009). Another set of issues arises from the simultaneity and causality of relationships. For example, economic growth opens opportunities for entrepreneurship and affects other factors that impact entrepreneurship; at the same time, entrepreneurship creates economic growth. In this study, the determinants of entrepreneurship were selected on the basis of previously published research (e.g. Reynolds, Storey, and Westhead 1994; Kangasharju 2000); however, the availability of data limited the selection of variables.

Panel data is used in this study. The models for entry and exit rates were generally specified as

$$\begin{aligned} \text{Entry_rate}_{kit} = & b_{k1}\text{Pop.density}_{it} + b_{k2}\text{Income}_{it} + b_{k3}\text{Unemployment}_{it} + b_{k4}\text{Time_2008_2010}_t \\ & + b_{k5}\text{Time_2011_2012}_t + a_i + u_{it} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Exit_rate}_{kit} = & b_{k1}\text{Pop.density}_{it} + b_{k2}\text{Income}_{it} + b_{k3}\text{Unemployment}_{it} + b_{k4}\text{Time_2008_2010}_t \\ & + b_{k5}\text{Time_2011_2012}_t + a_i + u_{it} \end{aligned} \quad (2)$$

In the models, i refers to municipality, t refers to year, a_i represents the unobserved effect for each municipality, u_{it} is the error term; b are coefficients for the independent variables, and k denotes the municipality type (1 = urban; 2 = urban hinterland; 3 = rural periphery). Time_2008_2010 and Time_2011_2012 are dummy variables to study the effect of the time period on entries or exit, using the 2005–2007 period as the base period.

The effects of the independent variables on entries and exits are studied in six models. In each model, the data is available for each municipality and for each year and is analyzed using the plm package in R. Fixed- and random-effects models were compared for each municipality type. Hausman tests ($p < 0.001$) confirmed that fixed-effects models were the better choice for all models. The results presented in Tables 3 and 4 are obtained using fixed-effects estimation.

Previous research (e.g. Delfmann, et al. 2014) suggests that a change in population density would have a different effect in urban and rural municipalities. As firm entries and exits patterns are often correlated (Dunne, Roberts, and Samuelson 1988; Bosma, Stam, and Schutjens 2011; Brown, Lambert, and Florax 2013), it was expected that the population density and income level would have the same kind of effect on entries and exits. As previous research (Reynolds, Storey, and Westhead 1994; Fritsch and Storey 2014) has indicated the mixed effects of unemployment on entrepreneurship, we had no clear expectations if the unemployment would have a significant effect on entrepreneurship. It was hypothesized that the recession from 2008 to 2010 and the weak economic recovery years of 2011 and 2012 would decrease entries and increase exits across all municipality types in comparison with the economic boom years of 2005–2007.

Results

Entry and exit rates in municipalities

Enterprise entry and exit in Estonia follows the same pattern in Latvia, described by Sauka and Welter (2014). The total number of entries grew from 2005 to 2007 and decreased in 2008 and 2009, followed by a sharp increase in 2010 that continued in the subsequent years. The number of exits was lower than entries. Following EU accession in 2004, the Estonian economy grew steadily and the mean enterprise entry rate was around two times higher than the exit rate. While the exits increased sharply in 2008 and 2009, the number of entries still exceeded the number of exits. Entries picked up pace between 2011 and 2012 and onwards, with the mean annual entry rate considerably higher than it was before the recession (Table 1). Therefore, the entry rate continued to increase in both periods of fast economic growth and weak economic recovery.

A legislative change to Estonian Commercial Code in 2011 may have contributed to this increase in number of entries in 2011 and 2012 in all types of municipalities in spite of the weak economy. An element of the Estonian government's policy to create a favorable entrepreneurial environment has been the push to make establishing an enterprise as easy and as quick as possible. Under certain conditions from 2011 onwards, individuals were allowed to register a private limited company in Estonia without contributing the required minimal share capital (Estonian State Portal 2015). In the following years, this opportunity was actively used as more than half of newly registered private limited companies were established without minimal share capital. The statistical data on entries used in this analysis do not specify the legal form of the new firm or if the new firms were established with or without minimal share capital. So the data are not sufficient to evaluate exactly how much of the increase in entry rates in 2011 and 2012 was caused by the easing of minimal share capital requirements or if this legislative change had different impacts in different regions.

The mean rates of entries and exits are presented in Figures 2 and 3. Upon visual inspection, the map of entry and exit rates shows a pattern of concentration of entries and exits into three main urban areas and their hinterland – the northern part of the country around the capital and in the areas around the two larger cities in the southern and southwestern part of the country.

The economic influence of the capital stretches along the northern coast. Across the years of the study, the Estonian capital of Tallinn accounted for 50% of all firm births and 55% of all exits (Statistics Estonia 2015). While the capital and some of the largest cities are among the municipalities with the highest entry rates, it is mostly the municipalities in their hinterlands and some in western Estonian periphery that make up the top 10% with the highest entry rate. With a few exceptions, the same municipalities also have the highest number of exits, with the capital city having the highest exit rate of all municipalities.

Rural municipalities in the northeastern corner of the country have low entry levels despite the proximity of relatively large cities (in Estonian terms), including Estonia's third largest city. This area is a declining industrial area and follows a similar trend described by Mason (1991) in western Europe, where former industrial locations exhibited low firm formation rates. Central Estonia is an area where agriculture still has a relatively high importance in the local economy, and it is characterized by a low number of nonagricultural firm entries. The differences between the three types of

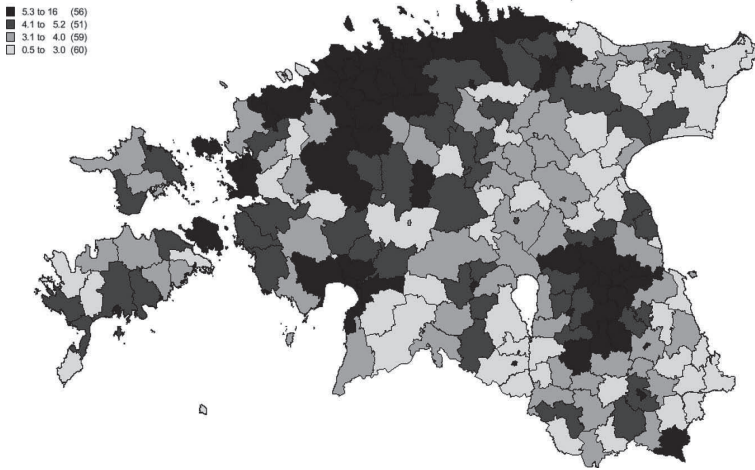


Figure 2. Mean entry rates.

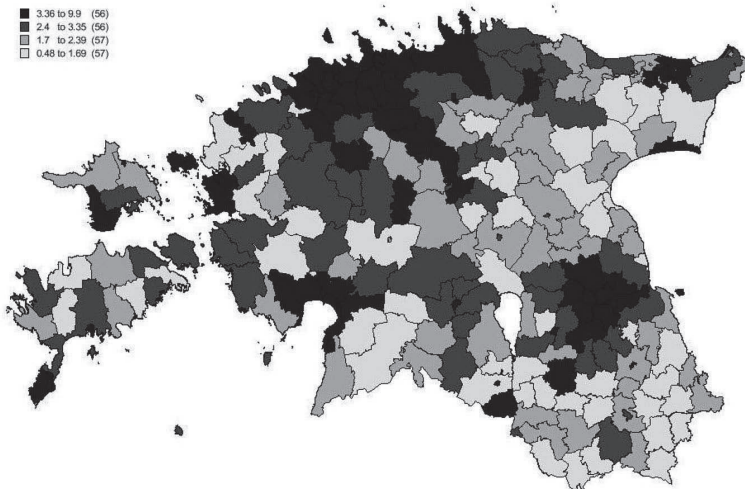


Figure 3. Mean exit rates.

municipalities in the entry and exit rates and in the local development indicators chosen for analysis were statistically significant (Table 2). Reynolds, Storey, and Westhead's (1994) review on firm formation rates in six countries showed that regional variations in firm birth rates were relatively similar across countries. Annual new firm formation was 2–4 times higher in regions with highest new firm birth rates in

Table 2. Statistically significant differences between municipality types.

Variable	Mean		Kruskal–Wallis test		Mann–Whitney U test		
	Urban municipalities (N = 33)	Urban hinterland (N = 48)	Rural periphery (N = 145)	Significance	Urban vs. urban hinterland significance	Urban vs. rural periphery significance	Urban hinterland vs. rural periphery significance
Entry rate 2005–2012	5.0	6.8	3.8	0.000***	0.022*	0.005**	0.000***
Entry rate 2005–2007	4.9	6.6	3.3	0.000***	0.042*	0.000***	0.000***
Entry rate 2008–2010	4.7	6.4	3.5	0.000***	0.032*	0.013*	0.000***
Entry rate 2011–2012	5.7	7.7	4.8	0.000***	0.009**	0.109	0.000***
Exit rate 2005–2012	3.4	3.9	2.2	0.000***	0.100	0.000***	0.000***
Exit rate 2005–2007	2.3	2.4	1.4	0.000***	0.372	0.001**	0.000***
Exit rate 2008–2010	4.2	4.8	2.6	0.000***	0.112	0.000***	0.000***
Exit rate 2011–2012	3.9	4.7	2.7	0.000***	0.099	0.001**	0.000***
Population density	947.7	33.4	20.0	0.000***	0.001**	0.000***	0.000***
Income	653	713	631	0.000***	0.033*	0.164	0.000***
Unemployment	5.1	4.0	4.5	0.005**	0.004**	0.033*	0.028*

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

comparison with regions with lowest firm births rates. In Estonian data, the differences between types were somewhat less. During the years of high economic growth, the entry rate in municipalities of the urban hinterland was twice as high as in rural peripheries and over a third higher than in urban municipalities. The exit rates were also highest in the urban hinterland and lowest in the rural periphery. However, the difference between urban municipalities and the hinterland was not statistically significant in the case of exit rates.

The entry rate slightly decreased in the recession years of 2008–2010 in urban areas and the urban hinterland. In the following years of 2011 and 2012, the entry rate climbed even higher than in the economic boom years of 2005–2007, reaching the highest rate of 7.7 new entries per 1000 labor aged persons in the urban hinterland and 5.7 new entries urban areas. In the same time period, the mean exit rates did not drop considerably in 2011 and 2012, suggesting a volatile economic environment. In the urban hinterland and rural periphery, the mean exit rates in 2011 and 2012 were almost twice as high as in the growth years of 2005–2007.

The rural periphery was the only type in which the entry rates did not decrease in the recession years of 2008–2010. The relative increase in the mean entry rate from 2005 to 2012 was highest in rural periphery municipalities; especially in 2011–2012. Therefore, it is possible that rural periphery municipalities benefitted most from the legislative change in 2011 easing capital requirements for private limited companies. For example, lower incomes in those areas hindered people's ability to raise the minimal starting capital for a company and, after the change in the legislation, the opportunity was quickly used to register a new firm without contributing the share capital.

The differences in population density, unemployment, and employee income level were also significant. During this time period, the overall population density in urban areas and rural peripheries decreased by 9% and 13%, respectively, with the capital city and a few peripheral rural municipalities the few exceptions experiencing a population increase. Smaller cities and most of the periphery saw a decline in population. At the same time, the population density grew in the urban hinterland by 15% (Statistics Estonia 2015). The income levels were highest and unemployment lowest in urban hinterland (Table 2).

Results of panel data analysis

Fixed-effects models are tested for both entries and exits for each type of municipality.

The three models that tested entries in the three types of municipalities are all statistically significant; however, the local development indicators used in the models only account for a small part of the variance of the entry rates (Table 3). In the model for urban hinterland (model 2), the independent variables explained 13% of variation in entry rates; in rural periphery, the model explained just 8% of variation in entry rates (model 3). In urban municipalities and the urban hinterland, only two of the variables are statistically significant. An increase in the income of an employee has a positive effect on the start-up rate in the municipality. The period of 2008–2010 shows a negative effect on the entry rates in comparison with the 2005–2007 base period.

In the rural periphery, the time period is not significant; this indicates that the impact of economic growth and contraction varied across the different types of municipalities. The entry rates are also significantly lower in the rural periphery in

Table 3. Estimates of fixed-effect models with entry rate as dependent variable: within estimation.

	Model 1	Model 2	Model 3
	Urban municipalities	Urban hinterland	Rural periphery
	Coefficient	Coefficient	Coefficient
Independent variables			
<i>Population density</i>	-0.001 (1.65)	-0.012 (-0.64)	0.015 (0.96)
<i>Income</i>	0.003 (1.99)*	0.007 (4.39)***	0.004 (2.98)**
<i>Unemployment</i>	0.003 (0.08)	0.060 (1.03)	0.052 (1.34)
<i>Time_2008_2010</i>	-0.902 (-2.01)*	-1.815 (-3.61)***	-0.623 (-1.80)
<i>Time_2011_2012</i>	0.015 (-0.03)	-0.741 (-1.36)	0.543 (1.35)
<i>F-statistic</i>	5.11***	10.21***	17.79***
<i>R²</i>	0.10	0.13	0.08
<i>Adjusted R²</i>	0.08	0.11	0.07

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; t -values in parentheses.

Table 4. Estimates of fixed effect models with exit rate as dependent variable: within estimation.

	Model 4	Model 5	Model 6
	Urban municipalities	Urban hinterland	Rural periphery
	Coefficient	Coefficient	Coefficient
Independent variables			
<i>Population density</i>	0.002 (1.13)	0.045 (3.18)**	0.014 (1.09)
<i>Income</i>	0.002 (1.85)	0.006 (4.87)***	0.003 (2.58)**
<i>Unemployment</i>	0.010 (0.34)	-0.011 (-0.25)	0.015 (0.50)
<i>Time_2008_2010</i>	1.494 (4.33)***	1.163 (3.05)**	0.645 (2.32)*
<i>Time_2011_2012</i>	1.290 (3.39)**	0.637 (1.54)	0.658 (2.04)*
<i>F-statistic</i>	34.0***	56.77***	23.10***
<i>R²</i>	0.43	0.46	0.10
<i>Adjusted R²</i>	0.36	0.40	0.09

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; t -values in parentheses.

the years of fast economic growth, suggesting the positive aspects of the macroeconomic growth were not felt in the rural periphery or they had a limited impact on entrepreneurship in those local municipalities. In the rural periphery, the only significant variable is the income of employees, indicating that the areas with the most increase in the income level of employees were most favorable for enterprise entries. During the time period of this study, population change varied by type of municipality, but the change in population density of the municipality did not affect entry rates.

The selected local development indicators are more suitable for explaining the variation in the exit models, especially in the case of urban municipalities and the urban hinterland. The independent variables explain 43% of the variation in the exit of firms in urban municipalities and 46% of the variation in the exit of firms in the urban hinterland (Table 4). In urban areas, the only significant factor on the exit of firms is the economic climate (model 4). In the urban hinterland and rural periphery, a change in the income level was significant. The exit rates increased with the rise in incomes in the case of the urban hinterland (model 5) and rural periphery (model 6). Changes in the level of unemployment did not have any effect on either exits or entries in the different models. The change in population density of the municipality did affect the exit rate, but only in municipalities of the urban hinterland (Table 4, model 5) as the increase in population density was linked to a higher exit rate.

As in entry models, the economic climate has a significant effect. As expected, the coefficients for the dummy variables for the time period of 2008–2010 and 2011–2012 are positive, indicating higher exit rates when compared with the economic boom years of 2005 to 2007 (Table 4).

Discussion

Estonian urban municipalities, urban hinterlands, and rural peripheries display significantly different firm formation and exits rates as well as disparities in income, unemployment, and population levels. The pattern of concentration of entrepreneurship around the capital city and its surrounding area in Estonia is similar to developments in other Baltic countries (e.g. Sauka and Welter 2014) and western Europe (Mason 1991). The literature shows that development pace within urban and rural areas can also differ considerably, with some rural areas even outperforming urban areas (Vaessen and Keeble 1995; Smallbone, North, and Kalantaridis 1999; Bryden and Munro 2000; OECD 2009). Typically, the accessible rural areas provide a more favorable environment for entrepreneurship. In this respect, developments in Estonia follow a similar pattern to a number of western European countries and the other Baltic countries. With higher incomes for employees and a lower unemployment rate, as well as a higher level of enterprise entries, the Estonian rural municipalities located in the urban hinterland are faring relatively better than their counterparts in urban centers and the rural periphery. In some aspects, the rural periphery has more in common with the urban centers than with the urban hinterland. In Estonia, easy access to credit fueled a real estate boom following accession to the EU (Purju 2013). This resulted in a significant number of real estate developments in the urban hinterland, with those municipalities experiencing an increase in population. Besides the population, entrepreneurship has also developed in those areas. The urban hinterland seems to capture more positive agglomeration effects (high entries, higher incomes, and lower unemployment) than their urban centers despite the population density being considerably lower in the hinterland than in urban areas.

The results suggest that local income levels and economic recession are the most crucial factors to affect entrepreneurship. If the local development indicator has a significant impact on entries or exits, however, the direction of the relationship is the same in different types of municipalities; the income variable is significant in five models out of six, it has a similarly positive regression coefficient in all models. The increase in incomes suggests a higher level of entries and exits in all municipality types. Likewise, the recession resulted in a decrease in entries and increase in exits across both urban areas and the urban hinterland.

As previous researchers (Reynolds, Storey, and Westhead 1994; Verheul, et al. 2001) have highlighted, growing income levels generally indicate an affluent economy, which has a positive impact on entries. However, competition will also be higher as a local customer base will attract enterprise to the area, but higher labor costs and fiercer competition for inputs in an area will result in a higher level of exits for those who cannot compete. This follows in the Estonian context as both entries and exits become concentrated in areas with an increasing local income level.

The high turbulence of entries and exits occurring at the same time is often referred to as characteristic of a normal market process in a healthy economy. In this study, the entry and exit patterns are strongly connected, indicating the same

patterns demonstrated by a number of other studies (Bosma, Stam, and Schutjens 2011; Brown, Lambert, and Florax 2013). Urban hinterland areas are characterized by a high level of entries as well as a high level of relative to their labor force. Low exits in the rural periphery may indicate better survival chances; however, the consistently low number of entries and exits still indicates very limited development. Therefore, following the rapid changes during the transition to a market economy, entrepreneurship in the rural periphery has stabilized to a low level of entrepreneurial activity. Even the favorable conditions of the high economic growth years failed to change this pattern. Local income levels were the most important factor for entries in the rural periphery, though incomes in those areas have been lagging behind those found in other municipalities since the economic restructuring during the transition years. This lag in incomes indicates continuing poor local demand and difficulties in raising capital. The legislative change in 2011 was undertaken to make the registration of enterprises as easy and cheap as possible, and this has been one measure that may have substantially contributed to the increase in entries, especially in areas with lower levels of income. However, it remains to be seen how the enterprises established with very little capital survive in the long term.

This study supports the results of Kangasharju (2000), wherein changes in population density do not have a significant impact on the entry rate. One possible explanation is that even in the urban areas in Estonia the population density is relatively low in comparison with western Europe and the urban areas themselves are small. The differences in densities between the urban and rural periphery are considerably lower, so that the same kinds of effects do not appear as in countries with more drastic differences between urban agglomerations and the periphery. While the population declined in Estonian urban areas and the rural periphery, firm formation increased. The entry patterns also show that there are a number of small municipalities in peripheral areas along the northern coast and on the islands of western Estonia where the entry rate was high. The majority of these municipalities on coast have low population density and have continued to suffer considerable depopulation in recent decades. On the one side, the population decline in the region means that the remaining population may be forced into entrepreneurship as other opportunities for paid employment disappear. However, at the same time, the features of the local area can also offer unique opportunities that local entrepreneurs can embrace, such as tourism activities along the coast, explaining the relatively high number of entries. For survival, the new enterprises in regions with decreasing population density must either be orientated to nonlocal markets or to products and services for which there are still sufficient demands despite local decline.

A high unemployment rate, while dependent on the regional and economic context, can both encourage and discourage entrepreneurship. The promotion of entrepreneurship has been one of the main solutions suggested for dealing with unemployment (Johansson 2000). This also holds true for Estonia as a considerable share of unemployment insurance funds is directed into entrepreneurship training and small amounts of seed capital for the unemployed. Unemployment in Estonia rose sharply with the onset of the recession, especially in 2009 and 2010, and it remained high throughout 2011 and 2012, despite the slow economic recovery. As a number of previous studies have suggested, unemployment can have different effects on entrepreneurship (Reynolds, Storey, and Westhead 1994; Fritsch and Storey 2014), and so it was not unexpected that the unemployment rate in local municipalities does not have

an effect on the entry and exits rates in Estonia. Unemployment in this paper measured at local municipality level; the spatial scale for unemployment may be too low and does not manage to capture increasing labor mobility. Also, the data on entries and exits was compared with unemployment data from the same year. So the analysis does not take into account possible longer time lags between people becoming unemployed and starting a business.

The economic recession and changes in the income levels of employees were more effective in explaining firm exits, indicating that a number of other factors affect firm formation other than those in the present models. Methodological issues in entrepreneurship research can cause low explanatory power of models, especially by omitting variables (cf. Parker 2009). At the same time, numerous individual and environmental factors together with their different interactions can affect potential entrepreneurs in the same area and time period in different ways, making it difficult to capture all possible factors and their effects with suitable proxies from available statistical data and models.

In the research, rural municipalities are divided into urban hinterland and rural periphery by a relatively crude measure. As the indicators of local development have the same kind of effect within the municipality types, using different indicators and more complex typologies to distinguish between different types of municipalities could provide more insight into the local determinants of entrepreneurship and whether the nature of their effect on entrepreneurship differs between different types of municipalities, as demonstrated in some previous research (e.g. Delfmann, et al. 2014).

Another limitation of the analysis is that the period studied is relatively short and the number of indicators selected for the models was small. The impact of local developments on entrepreneurship and the effects of entrepreneurship on local development manifest over a longer period of time. This also complicates the policy responses set to address regional development issues. Feldman (2001) points out that government development policies aim to replicate the characteristics of successful locations; however, the conditions associated with entrepreneurship develop over time and they result from functioning entrepreneurship and its interaction with the environment. It takes time before the direct and indirect local economic effects from entrepreneurship development appear, and the idiosyncratic nature of the local economy makes it complicated to replicate the conditions that work in some other region (Audretsch and Pena-Legazkue 2012).

In this study, the particular industry or sector of the enterprises is not examined. Previous research (e.g. Van Stel and Suddle 2008) indicates that the economic activity sector of the start-up impacts their effect on regional development. The focus of the analysis is on local municipality level. New entries and exits of uncompetitive firms are obviously a vital part of the market process, and the number of start-ups is a common metric used for comparing the performance of local municipalities. However, with low spatial units, there can be very high fluctuations in the rate from year to year, making it hard to capture the effects of wider regional developments. The analysis at the higher regional level has its advantages; but it obviously has disadvantages also as it does not take into account the considerable variances within the region. Furthermore, as the creation and survival of enterprises depend on the interaction between the personal characteristics and motivations of the entrepreneur as well as the local environment, there are inevitably limits on how much of the process the local conditions can explain.

Conclusion

In this study, we focus on entrepreneurship and local development indicators in Estonia between 2005 and 2012, during which Estonia went through a cycle of high economic growth, deep recession, and slow recovery. Fixed-effects regression models are used to compare the effects of population density, employee income levels, unemployment and the time period on firm entries and exits in urban areas, urban hinterlands, and rural peripheries. From 2005 to 2012, both the firm entry and exit rates steadily increased in Estonia with the number of new entries higher than exits. As anticipated, the increase in exits was rapid during the recession years of 2008–2010, but the overall trend of the rapid increase in entries and exits continued in the volatile economic recovery years of 2011–2012.

As with other western European and Baltic countries, Estonia is characterized by a concentration of economic activity around the capital city and a different development pace within rural regions. The rural municipalities within the urban hinterland have significantly higher-level enterprise entries, incomes, and lower unemployment than urban centers and the rural periphery. A high level of exits, indicating strong connections in entry and exit patterns, also characterizes the urban hinterland. Unlike the results of a number of studies, the change in the population density of a municipality does not have a significant effect on enterprise entry and exit rates in Estonia, with the exception of exits in the urban hinterland. Changes in unemployment levels do not have a significant impact on entries and exits within municipalities.

In the panel data models, the income of employees in the municipalities and the recession years of 2008–2010 had the largest impact on the entry and exit rates in three municipality types. While the mean firm entry and exit rates significantly differed in the three types of municipalities in the present analysis, the comparison of the six panel data models suggests that where the local development indicator had a significant impact on entries or exits the factor had the same kind of impact in urban and rural municipalities. In Estonia, the period of rapid restructuring of the rural economy has passed and it is the nature of the ongoing socioeconomic developments and specific characteristics of the local municipality that seem to have more impact than whether the municipality is rural or urban. Lower local income levels may explain the significantly lower entry levels in urban areas and rural peripheries. An increase in local incomes would result in a similarly higher level of firm entries as those seen in urban hinterlands. Another explanation could be that the differences in Estonia between urban and rural are not that pronounced, so changes in population or income levels, among other factors, would have different effects within urban and rural contexts. However, as the rural periphery is characterized by the lowest incomes, the disparity is likely to persist.

Estonia has a very small and open economy. This makes it difficult to determine effective local policy responses for encouraging entrepreneurship as it is very exposed to global economic headwinds. Estonian policy measures that facilitate the establishment of an enterprise without minimal share capital in order to alleviate the capital constraints of potential entrepreneurs can be justified when the overall objective of policy is to increase firm entries. However, the high number of firms established with very few resources might not lead to the jobs and economic growth that the policymakers are hoping for.

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Research interest:

Rural entrepreneurship, regional
development, farm exits, diversification of
economic activities in rural areas

Additional training:

- 2011 European Association of Agricultural Economists PhD Workshop „Economics and Social Research in Food, Agriculture, Environment and Development“; Nitra, Slovakia
- 2011 International Co-operative Alliance PhD seminar “Acquiring the licence for co-operative research”, Mikkeli, Finland
- 2012 European Society for Rural Sociology & Ruralia Institute PhD Summer School “Rural-urban relationship revisited” Ristiina, Finland”
- 2012 Institute for Agricultural and Fisheries Research (Belgium) & University of Ghent PhD Winter School “Rural development in peri - urban areas” Valbeek, Belgium
- 2012 Aleksandras Stulginskis University, course "Role of agriculture and natural resources in sustainable rural development (AGSURUDE)" Kaunas, Lithuania

Awards:

- 2013 Rein Otsason Fund's award for finance and economics students
- 2013 „Farmer as a top manager“ award from the organisers of the conference "Farmer as a top manager" and Joosep Toots Fund in Estonian University of Life-Sciences

Research projects:

- 2016- 2020 Edu Tegu- Development of entrepreneurial education throughout all educational levels
- 2013- 2016 Efficiency of utilization of the main production resources in Estonian agriculture (8-2/T13044MSDS)

2015- 2016	Background report for OECD “Estonian innovation policy and Agricultural innovation system” (8-2/T15140MSDS)
2015- 2016	Agricultural producers' demand for alternative financial services (8-2/T15135MSAT)
2014	Assessment of conditions for regional competitiveness and development of Põlva County (8-2/T14087MSDS)
2011- 2012	Rural Enterprises' Situation, Development Trends and Need for Support (8-2/T11068MSDS)
2008- 2012	Sustainability of rural life and rural economy in Estonia: current situation, main drivers and development scenarios (8-2/T8002MSMS)
2012	Pilot study of developmental requirements and obstacles of rural enterprises (8-2/T12162MSDS)
2012	Needs and obstacles for entrepreneurship development in Järva County (8-12/T12193MSDS)
2011	Elaboration of rural development index and review of economic, environmental and social problems and trends in rural areas (8-2/T11042MSD)
2008- 2011	E-RURALNET - Network promoting e-learning for rural development“, Lifelong Learning Programme (2007-2013) (8-2/T10160MSMS)
2009- 2011	The analysis of measures for systemic development of Estonian agriculture, forestry and nature conservation, and the analysis of trends of respective EU policies (8-2/T9049MSMS)

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- 2011 Rahvusvahelise Ühistegevuse Liidu (ICA) doktorantide seminar “Acquiring the licence for co-operative research”, Mikkeli, Soome
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- 2012 ILVO (Belgia) & Ghendi Ülikooli doktorantide talvekool “Rural development in peri - urban areas” Valbeek, Belgia
- 2012 Aleksandras Stulginskise Ülikool, intensiivkursus "Role of agriculture and natural resources in sustainable rural development (AGSURUDE)" Kaunas, Leedu

Tunnustused

- 2013 Rein Otsason Fondi stipendium rahanduse või majanduse üliõpilasele
- 2013 "Põllumees kui tippjuht" stipendium konverentsi "Põllumees kui tippjuht" põllumajandussektori tippjuhi valimise komisjoni ja EMÜ Joosep Tootsi Fondi konkursil

Projektid

- 2016- 2020 Edu Tegu- Ettevõtlikkuse ja ettevõtlusõppe süsteemne arendamine kõigil haridustasemetel
- 2013- 2016 Peamiste tootmisressursside kasutamise efektiivsus Eesti põllumajanduses (8-2/T13044MSDS)
- 2015- 2016 Taustaraporti koostamine OECD poolt koostatavale ülevaatele "Eesti innovatsioonipoliitika ja

	põllumajandusvaldkonna innovatsioonisüsteem" (8-2/T15140MSDS)
2015- 2016	Nõudlusuuringu tegemine ja äriplaani koostamine alternatiivsete finantsteenuste pakkumiseks (8-2/T15135MSAT)
2014	Põlvamaa piirkondliku konkurentsivõime võimaluste väljaselgitamine ja arengueelduse (8-2/T14087MSDS)
2011- 2012	Maapiirkonna ettevõtjate olukord, arengutrendid ning toetusvajadus (8-2/T11068MSDS)
2008- 2012	Maaelu ja maamajanduse jätkusuutlikkus Eestis: senine olukord, peamised mõjutegurid ning arengutsenaariumid (8-2/T8002MSMS)
2012	Pilootuuringu "Maapiirkonna ettevõtluse arenguvajadused ja -takistused" läbiviimine (8-2/T12162MSDS)
2012	Maapiirkonna ettevõtluse arenguvajadused ja -takistused Järvemaal (8-12/T12193MSDS)
2011	Maaelu arengu indeksi väljatöötamine ja ülevaate koostamine maapiirkondadele iseloomulikest majandus-, keskkonna- ja sotsiaalprobleemidest ning arengusuundumustest (8-2/T11042MSD)
2008- 2011	E-RURALNET – Maaelu arenguks e-õppe arendamise võrgustik (8-2/T10160MSMS)
2009- 2011	Eesti põllumajanduse, metsanduse ja loodushoiu süsteemse arendamise abinõude ja EL vastavate poliitikate tulevikusuundade analüüs (8-2/T9049MSMS)

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Põder, A., Viira, A.-H., Värnik, R. 2017. Firm entries and exits in Estonian urban municipalities, urban hinterlands and rural peripheries 2005-2012. *Journal of Baltic Studies*, 48 (3): 285–307. DOI 10.1080/01629778.2016.1210661.

Viira, A- H., **Põder, A.**, Värnik, R. 2013. The determinants of farm growth, decline and exit in Estonia. *German Journal of Agricultural Economics* 62(1): 52 - 64.

Viira, A- H., **Põder, A.**, Värnik, R. 2014. Discrepancies between the intentions and behaviour of farm operators in the contexts of farm growth, decline, continuation and exit – evidence from Estonia. *German Journal of Agricultural Economic*, 63 (1): 46–62.

1.2 – Peer-reviewed articles in other international research journals

Põder, A. 2012. Entrepreneurial activity in Western Estonian rural municipalities in 2006 and 2010: a cluster analysis. *Economics and Rural Development Research Papers*, 8(1): 32 - 42.

Nurmet, M.; Lemsalu, K.; **Põder, A.** 2012. Financial Performance in Micro and Medium Sized Rural Companies. *Management Theory and Studies for Rural Business and Infrastructure Development* 34 (5), 139–147.

Viira, A- H., **Põder, A.**, Värnik, R. 2009. 20 years of transition-institutional reforms and the adaptation of production in Estonian agriculture. *German Journal of Agricultural Economics* 58(7): 286 - 295.

Viira, A-H., **Põder, A.**, Värnik, R. 2009. The factors affecting the motivation to exit farming – evidence from Estonia. *Food Economics - Acta Agriculturae Scandinavica C*, 6: 156–172

1.3 – Scholarly articles in Estonian and other peer-reviewed research journals with a local editorial board

Värnik, R.; Moor, A., Sepp, V., **Põder, A.**, Prits, M., Leetsar, J. 2011. Maa, maalisus ja maapiirkonnad. Värnik, R. (toim.). Maaelu arengu aruanne 2011. Tartu: EMÜ Majandus- ja sotsiaalinstituut: 11–38.

Omel, R., Värnik, R., **Põder, A.** 2011. Maaelu arengu hindamine. Värnik, R. (toim.). Maaelu arengu aruanne 2011. Tartu: EMÜ Majandus- ja sotsiaalinstituut: 39–66.

3.1 – Articles in collections indexed by the Thomson Reuters ISI proceedings

Põder, A., Nurmet, M. 2014. Estonian Rural and Urban Enterprises' Investments in Fixed Assets and Changes in Sales Revenue From 2005 to 2010. Proceedings of the International Scientific Conference Economic Science for Rural Development. Jelgava: Latvia University of Agriculture 35: 182 - 188.

Sakk, O.; Nurmet, M., **Põder, A.** 2013. Financing Trends in Estonian Rural Enterprises during the Period of 2005-2010. Proceedings of The Sixth International Scientific Conference “Rural Development 2013. Kaunas: Aleksandras Stulginskis University 1: 317–321.

Põder, A., Moor, A., Luks, L. 2012. Estonian farmers’ opinions on their environmentally friendly behaviour and knowledge. Proceedings of the International Scientific Conference Economic Science for Rural Development. Jelgava: Latvia University of Agriculture: 184–189.

Põder, A.; Nurmet, M.; Värnik, R. 2011. Entrepreneurial activity in rural municipalities of three South-Eastern Estonian counties in 2005-2009: a cluster analysis. Proceedings of the International Scientific Conference Economic Science for Rural Development 26: 182–191.

Põder, A., Viira, A-H., Putk, K. 2011. Farmers’ opinions on the outlook of agriculture in Estonia: a multiple regression analysis. Proceedings

of the Fifth International Scientific Conference “Rural Development 2011”. Kaunas: Lithuanian University of agriculture: 185–189.

3.2 – Articles in books or proceedings published by Estonian or other publishers not listed by Thomson Reuters Conference Proceedings Citation Index

Leetsar, J., **Põder, A.**, Krusealle, J., Värnik, R. 2012. The development of Estonian agricultural co-operatives and agricultural policy proposals for developing rural economic co-operation. Heiskanen, J., Henry, H., Hytinkoski, P., Köppä, T. (eds.). New opportunities for co-operatives: new opportunities for people. Mikkeli: University of Helsinki Publications; 27: 72- 85.

3.5 – Articles published in the proceedings of Estonian conferences

Põder, A., Nurmet, M., Lemsalu, K. 2013. Financial Performance of Estonian Rural Companies in Three Economic Sectors from 2005 to 2010. Ettevõtlus Eesti maapiirkondades: tegevusvaldkondade areng ja probleemid: Eesti Majandusteaduse Seltsi aastakonverents. 25-26.01.2013 Põlvas. Tartu: Eesti Maaülikool.

Viira, A.-H., **Põder, A.**, Värnik, R., Ruutas-Küttim, R. 2011. Eesti maaelu arengustenaariumid. Maaelufoorum 2011, Tartu, 08.11.2011. Eesti Põllumajandus-Kaubanduskoda, 16–17.

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Põder, A., Nurmet, M. 2014. Investment plans of Estonian rural enterprises for the next 7 years: a comparison of primary, secondary and tertiary sector. NJF Seminar 467, Economic framework conditions, productivity and competitiveness of Nordic and Baltic agriculture and food industries, 12-13 February 2014, Tartu, Estonia: 30–31.

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Economic framework conditions, productivity and competitiveness of Nordic and Baltic agriculture and food industries, 12-13 February 2014, Tartu, Estonia: 28–28.

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AND SOIL FUNGAL COMMUNITIES ASSOCIATED WITH STRAWBERRY FIELDS
MULLA PATOGEENI VERTICILLIUM DAHLIAE KLEB.
JA MULLA SEENEKOOSLUSTE ISELOOMUSTAMINE MAASIKAPÕLDUDEL

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LAND PLOT FRAGMENTATION

MAAREFORMI ELLUVIIMINE EESTIS: INSTITUTIONAALNE KORRALDUS,
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