COMMUTING AS A FACTOR IN LOCAL PUBLIC FINANCE IN ESTONIA[1]

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Abstract

Regions are increasingly competing indirectly because of the increasing mobility of populations. According to OECD (2005) figures, interregional commuting rates are high. Intraregional commuting rates are even higher and steadily increasing. Commuting has a significant influence on the income of municipal populations and so also tax revenues of local governments in Estonia, but this phenomenon has not yet been deeply studied. This paper aims to study the scope of commuting and the resulting effects relating to personal income tax on municipal budget revenues in Estonia, on the basis of data from the Estonian Tax and Custom Board. Based on the findings, it can be said that commuting is a very important factor in municipal development, as net income from commuting accounts for up to 80% of local government revenues from personal income tax.

Keywords: commuting, regional development, revenues of municipalities, Estonia
JEL: R23, R51

Introduction

Regions are increasingly competing indirectly with each other because of the increasing mobility of populations. Population mobility can be categorized into migration and commuting. In this study, we focus on commuting. As stated by Presman and Arnon (2006), some regions of a country turn into employment centers by increasing their population through immigration, but also by attracting commuters from other areas, while other regions become sources of emigration, or residential ("sleeping") areas in which a high percentage of residents are employed outside the region. Presman and Arnon (2006) claim that, in addition to accelerating the development of infrastructure, commuting can decrease regional disparities in

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wages and unemployment rates. Commuting flows facilitate an increasing labor supply in the center while decreasing the unemployment rate in the periphery.

Based on previous surveys, it can be said that commuting has been investigated mainly from the socioeconomic perspective (see e.g. Heinz & Ward-Warmedinger 2006). In this study, we focus on wages and the accompanying tax flows between regions resulting from commuting. Commuting is an important factor in narrowing regional wage gaps, as wages decrease in the central cities and increase in peripheral regions. Hazans (2003) documents that, as a result of commuting, average wage gaps between capital cities and rural areas decreased by 4% in Lithuania and 15% in Estonia, and wage gaps between capital cities and other cities decreased by 2% in Lithuania and 8% in Estonia and Latvia.

Based on Hazans (2003) and Sandow (2011), in-state commuting is defined as the movement of labor forces crossing the borders of municipalities. The wage flow of commuters (based on income tax paid), as an important component of local government revenues, is the focus of interest in this study.

The current research aims to identify the significance of commuting and its impact on local government budget revenues in Estonia. The research question of this study is: what is the scope of commuting and what are its effects on local government budget revenues in relation to personal income tax? The results of the study provide a comprehensive assessment of the effects of divergence in people's place of work and place of residence on differences in levels of municipal development based on local government budget revenues.

The paper consists of four parts: the first is a review of the literature about the nature of commuting within the context of municipal development. The second part introduces the methodology of the empirical analysis, and discusses issues of data gathering and analysis, and the reliability of the data. Thirdly, there is a discussion of the findings of the empirical analysis of commuting as a source of resource redistribution between municipalities. The last part concludes the paper.

Theoretical background and research overview

The adjustment of populations with regional living and working conditions has been studied quite widely in the scientific literature (Garmendia *et al.* 2011; Scheiner 2006; Termote 1980; van Ham 2001 etc). Those studies form the basis for a systematic analysis of in-state commuting. Most commuting patterns have been linked primarily to the availability and nature of work. Schindegger and Krajasits (1997) observe that long-distance commuting among rural residents is linked to the fact that rural areas often lack sufficient job opportunities to utilize fully their resident workforces.

The terms "short-distance commuting" and "long-distance commuting" are coming into the literature, but how far the workplace has to be from the place of residence in order to call it long-distance commuting varies. For example, in Scotland long-distance commuting is considered to be 15+ kilometers (Scottish Household Survey 2006) but in Sweden it is 100+ kilometers (Swedish Institute for Transport and Communication Analysis 2007). These distances depend on the quality of the roads and the efficiency of transportation systems, which determine travel times for commuters. Getis (1969) suggests that individuals are indifferent to commuting distance as long as it does not exceed some maximum level. According to the evaluation made by Boeri *et al.* (1996), acceptable commuting distances in transitional countries in Central and Eastern Europe do not exceed 30 kilometers. Kertesi and Köllö (1997) reach the same conclusion for Hungary, where they find that the "indifference point" is just 27 kilometers.

Based on time, commuting has been looked at from two different angles. In some studies, commuting is defined directly as the time spent traveling from home to work. Depending on the destination (within a city, between a rural area and a city, between rural areas) and the type of transportation, the time spent for commuting varies considerably for the same distance traveled. Several studies conclude that for most people 45 minutes is the maximum acceptable time for going to work (van Ham 2001; van Ommeren 1996; Wachs *et al.* 1993). The main weakness of this kind of definition is that the development of roads and transportation is increasing the distance that can be covered within the same time.

In 2000–2002, the average commuting time in the former EU15 countries was 37.5 minutes per day, ranging from 29.2 minutes a day in Portugal to 51.2 minutes in Hungary (Economic Comission for Europe 2001). According to the U.S. Census Bureau, American employees averaged 48.8 minutes on daily trips to and from their workplaces.

An additional dimension to the distance and time consumption of commuting is the regularity of travel. The nature and socioeconomic outcomes of commuting depend significantly on the frequency of travel – is it daily, weekly or with other kind of regularity? It is obvious that the more often the commuting takes place, the shorter the distance and time consumed for traveling need to be.

For defining in-state commuting, states' administrative-territorial divisions into regional units can be taken as the basis. Sandow (2011) has written that in Sweden and Finland commuting is defined as "going to work by crossing the administrative border (for example, border of municipality)". Hazans (2003) in his study of Baltic States has also used a definition of commuting based on municipal borders.

Most definitions of commuting, especially distance-based definitions of commuting, do not apply well within Estonia, because of the small territory of the country.

Hazans (2003) has assessed that the average distance between workplace and the place of residence in Estonia is 24 kilometers. But only 8–9% of people work more than 20 kilometers from their place of residence. The usual commuting distance is just 9 kilometers, but Hazans (2003) emphasizes that distances within small Baltic States are not comparable with those of large countries, because "in the Baltic States 10–15 km away from the borders of capital cities bring you into a different world" (Hazans 2003: 5).

The commuting phenomenon is a kind of individual spatial behavior induced by the geographic separation of living and working places. It is obvious that people have to commute to and from work if there exists a spatial distance between housing and working locations. According to urban location theory, it is assumed that rational individuals compare the benefits with the pecuniary and non-pecuniary costs of commuting and make utility-maximizing location decisions about residential and working places as well as modes of transportation for commuting between those places.

The benefits arising from commuting are that more attractive working and living conditions can be chosen than those available in close proximity. People will only accept higher costs of commuting if they are compensated by additional financial benefits gained from higher wages and/or lower rents or by additional non-pecuniary benefits arising from more favorable working and/or living environments (Boje *et al.* 2009).

Based on Breiholz *et al.* (2005), qualified labor is more mobile than unskilled workers. Additionally, the willingness to increase commuting distance or time increases, the higher the qualification, income and working position. Haas and Hamann (2008) find that the highest percentage of commuters is highly qualified people; low-skilled people commute less frequently. Therefore it can be expected that highly educated and high-income earners are overrepresented among commuters. At the same time, based on Presman and Arnon (2006), the relationship between commuting and income must be a reciprocal one; since commuting incentives rise with higher income levels in other regions, commuters' average earnings are higher than those of non-commuters.

According to Hazans (2004), in the Baltic countries commuters' earnings are higher than those of identical non-commuters by 16, 11 and 20 percent in Latvia, Lithuania and Estonia, respectively. Cameron and Muellbauer (1998) find in British Labor Surveys that commuters' earnings are higher by 62%, on average, relative to those of non-commuters. In Germany, Frey and Stutzer (2004) conclude that commuters with commuting times of 23 minutes in one direction (average time in their survey) have to receive monthly average premiums of 19% to fully compensate them for their time loss. Zenou (2003) has developed an urban monocentric efficiency wage model, in which wage rate rises with commuting distance. The fact that wages rise

with commuting time and length has been documented in several empirical studies (e.g. Madden 1985 for the U.S. and Manning 2003 for Great Britain).

Based on Boje *et al.* (2009), commuting behavior depends on several individual characteristics such as job and income opportunities, gender, age, and working position. Costs of commuting are compensated by benefits from lower rents and/or higher wages. Private costs of commuting are not only pecuniary, such as money spent on commuting, but also involve non-pecuniary costs of time spent commuting and environmental conditions, causing negative mental and physical reactions. Commuting costs depend on city size, metropolitan density, and development of infrastructure, as well as mode of transportation chosen; these costs increase, the greater the distance, time and money spent on commuting (Boje *et al.* 2009).

Benefits from commuting are accompanied by commuting costs that individuals have to take into account when making a decision to commute between their living and working places. Commuting costs are influenced by age, the number of children in a household, gender, and non-labor income. The probability of employment outside the residential locality falls with age (Hazans 2004; Ory *et al.* 1998, So *et al.* 2001). Younger individuals prefer bigger houses for larger families and so accept longer commuting distances. Older employees are less eager to commute, and can often afford to change workplace or place of residence in order to shorten commuting distance. Commuting is more complicated for families with children when parents need to combine work with childcare (So *et al.* 2001). Non-labor income increases the demand for leisure and reduces the incentive to commute long distances. Thus commuters have less non-labor income, while people with higher non-labor income tend to reside in metropolitan areas (So *et al.* 2001). Commonly, suburban residents commute more than city residents (Ory *et al.* 1998). Commuting is frequent in developing regions where the problems of matching the demand with the supply of skills necessitate commuting more than in established, economically developed regions (Presman & Arnon 2006; Van der Laan 1998).

A consistent finding of commuting studies is that commuting duration and length are shorter for females than for males. Early evidence for this is found in papers by White (1977) and Madden (1981). Several studies report that commuting distances are longer for married men relative to single men, and that women's commuting distances are shorter than those of their husbands (e.g. Gordon *et al.* 1989; Presman & Arnon 2006).

People's individual decisions to commute have an important influence on socioeconomic development. Those in Estonia who have found workplaces in cities while living in rural municipalities also support the development of these rural municipalities through local government budget revenues from personal income tax. At the same time, the outflow of money is not beneficial to the local governments of the centers, who have to maintain the infrastructure to service the people who are

coming from outside to work in the center. Local public services are also provided mostly in the municipality of residence (nursery school, general education, cultural services, administrative services etc). So these discrepancies between working and places of residence generate increasing political controversy between local governments. There have even been suggestions to divide personal income tax between the municipality of employment and the municipality of residence.

The welfare of the population is determined at the municipal level in particular by the income level of the population and also by the amount and quality of public service provision, which is financed in Estonia by local governments. Nearly 50% of local government budget revenues come from personal income tax, which in Estonia is fixed at the rate of 21% of personal income. 11.4% of municipal residents' gross salary is distributed through the Tax and Custom Board into the budget of their particular municipality.

Studies of labor mobility have focused mainly on central macroeconomic issues such as unemployment and economic growth (e.g. Briffault 1996; Heinz & Ward-Warmedinger 2006), and also aspects like changes in regional populations and a wide range of socioeconomic issues stemming from those changes (e.g. Eliasson *et al.* 2003; Renkow & Hoover 2000). But no studies about the economic effects of in-state commuting on municipal development or budget revenues are to be found.

In Estonia, general mobility has been widely studied from the 1930s (Kant 1933, 1957). The next major study was performed in the 1980s by Marksoo *et al.* (1983). In modern Estonian independence times, there have been four studies of general in-state commuting in Estonia, by Hazans (2003), Tammaru (2001), and Ahas *et al.* (2010) and Ahas and Silm (2013). All these studies have concentrated on the numbers of people commuting and the social effects, not the fiscal impact of commuting on local government revenues. So it can be said that the economic effects of commuting have not yet been studied thoroughly in Estonia.

The above-mentioned studies have shown a rapid increase in in-state commuting in Estonia – in the 1980s it was 68,000 people (4.6% of the Estonian population) (Marksoo *et al.* 1983), while in 2001 it was 115,000 people (8.4% of the Estonian population) (Tammaru 2001). The general mobility of people was also considered in the last two studies, which were the first to use mobile-phone positioning techniques – on this basis, around 600,000 people (Ahas *et al.* 2010), which is around 50% of the Estonian population, is moving regularly between municipalities. But the results of this study are not directly comparable with those of previous investigations because there exist many reasons for moving between municipalities in addition to work.

Data and method

As commuting is not a direct demographic phenomenon, because it does not affect significantly the level and structure of the population, it has not been studied thoroughly from the economic point of view. The daily regularity of commuting involves only the "daytime population" of the municipality, whereas the "night-time population" that the demographic analyses are dealing with stays the same. Also, data about migration is easily gathered while data about commuting is more difficult to obtain, because commuting is hard to specify qualitatively and to measure quantitatively. This may also be the reason that empirical studies of the economic aspects of in-state commuting are hard to find.

In Estonia, we can use the data from the Tax and Custom Board (TCB), which directs 11.4% of a taxpayer's gross salary, as municipalities' share of personal income tax (PIT), into the budget of whichever local government or municipality a taxpayer is registered in. The PIT is first transferred to the TCB by people's employers. So the TCB has full data about commuting to work – the municipality where the employer is located and the municipality where the individual is registered. Unfortunately, this data is generally not processed because this is very time-consuming. For now, TCB has been able to process only the data of the municipalities of one region – Pärnu county (in the west of Estonia; see the administrative map of Estonia in Figure 1) and only for the first half of the year in 2011 and 2012.

PIT is the main source of local government budget revenues – in average approximately 47% (see Annex 1). So PIT contributes to a considerable part of the socioeconomic development of municipalities and the supply of local public services by local governments. The significance of commuting for local development will be characterized in this paper through the scope and percentage of PIT flows caused by commuting.

This study will analyze the scope of commuting and the resulting effects on local government budget revenues from three aspects:

- the share of inhabitants going to work outside the residence municipality in the same county and the share of PIT they have brought to the budget of the residence municipality;
- the share of inhabitants going to work in the county center and the share of PIT they have brought to the budget of the residence municipality;
- the share of inhabitants going to work outside the residence county and the share of PIT they have brought to the budget of the residence municipality.

From another angle, the share of commuters coming to work in the investigated municipality from outside this municipality (the percentage of commuters in the labor force exploited in the municipality) and the ratio of PIT flowing out of the

investigated municipality to the local government budget revenues of the residence municipality are also analyzed.

The municipalities of Pärnu county (see Figure 1) are taken as the basis for this paper. Pärnu county can be considered a representative county for describing the general situation of Estonian municipalities and aspects of commuting for the following reasons:

- the size (km^2 and number of inhabitants) of the municipalities in Pärnu county matching those of average Estonian municipalities (except for Pärnu city, which is the third largest municipality in Estonia) (see Appendix 2);
- the distance from the capital city of Estonia – Tallinn;
- the share of the labor force among the municipal inhabitants (Estonian unemployment rate 2014 is 7,4%; in Pärnu county it is 6,2%; average wage in Estonia (before taxes) is 1023 eur; in Pärnu county 869 eur).

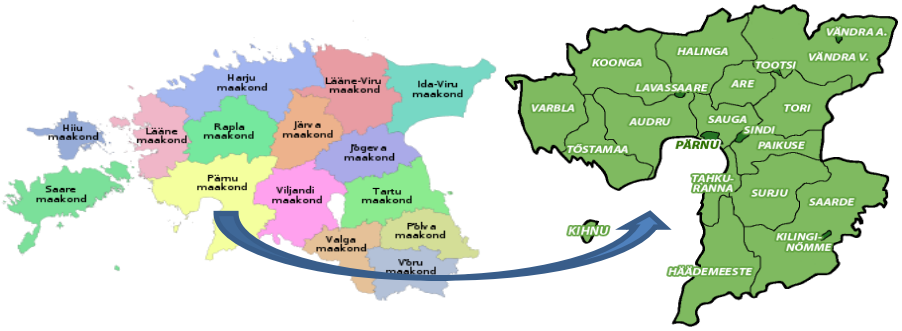

Figure 1. Administrative-territorial map of Estonia: counties, and divisions of Pärnu county: municipalities.

To obtain a better overview of municipal characteristics as the basis of the commuting processes, Appendix 2 was constructed (see Appendix 2).

The data about commuting used in this paper is unique because it is based on the tax return declarations of organizations and is checked by the TCB systematically. In comparison with data collected through questionnaires, the TCB data reflects commuting more thoroughly and precisely. Especially important is the fact that this data not only shows the existence of commuting but also that the flows of PIT help to assess the degree of influence of commuting on local government budget revenues.

At the same time, we generally have to consider the following constraints on the analyzed data and in this study especially:

- Commuting created through the shadow economy cannot be assessed, but in Estonia the shadow economy has a relatively high share of economic activity.
- The data characterizes only very short periods – the first halves of the years 2011 and 2012 – to make generalizations based on the results of the analysis.
- The data about working places reflects the official addresses of employers, but they can have official addresses in Tallinn or elsewhere (mostly in larger centers), while the actual working place is often outside these centers.
- The TCB data reflects the official registration of peoples' places of residence. But registration of place of residence in Estonia is not obligatory and is not systematically controlled by authorities, so the registration of place of residence does not necessarily reflect the actual places of residence of people who are registered in the municipality. In such cases, the TCB data about PIT flows to municipal budgets does not characterize commuting.
- The TCB data makes no distinction between full-time and part-time employees, which means one person can have a working place in the residence municipality and at the same time a second job outside it – so PIT flows between municipal budgets reflect commuting better than does the number of commuters.

These constraints indicate that the analysis done for this article should be considered a pilot project for characterizing an interesting research direction. However, the data gives a rough assessment of real commuting flows between municipalities and also confirms that this is the way to study Estonian municipal development sustainability (i.e. the ability to manage development in a situation of increasing competition). The high level of commuting between municipalities could be seen as encouragement to increase cooperation between these municipalities.

Results of the commuting analysis

To accomplish the purpose of the article – to analyze the scope of commuting and the resulting effects on the development of local governments based on the contribution to municipal budget revenues by personal income tax – commuting has been considered from different angles: the share of PIT brought into the municipality; the share of "potential" PIT taken out of the municipality; and the influence of commuting on the municipality. The results of the analysis are provided in Appendices 3, 4 and 5.

First looked at Appendix 3 and the share of municipal labor forces working in the same municipality where they live and the share of PIT they have brought into budget of this municipality (see Appendix 3, column 1). People who live and work in the same municipality are the most connected with the municipality's

development and are more interested in its development as a source of wellbeing for them. People who work outside their residence municipality remain beyond the development of their residence municipality – they are further beyond, the farther their working place is situated. Based on this, inhabitants who work in their residence municipality must be viewed as the core of that municipality's development. The greater the ratio of those people to the overall number of inhabitants, the stronger the base of that municipality's development potential.

As can be seen from column 1, the situation in this case is interesting – in all municipalities, including the county center – Pärnu city – less than half of the labor force works within their "own" municipality. There are large differences between municipalities that are connected through borders with the center (Sauga, Paikuse) or situated very close to the center (Sindi) and municipalities that are situated far from the center with at least one municipality between them and the center (Tori, Halinga, Vändra alev, Saarde). Column 1 shows that the closer a municipality is to the county center (Pärnu city), which is also the drawing center for the in-county commuters, the less likely it is that people work in the municipality where they live.

A special case exists with the county center – Pärnu city – itself. Although column 1 shows that less than half (48%) of its residents are also working there, the ratio of working places to working residents is 84%. The low employment level of its own residents could be because of its relative closeness to the most important work supplier in Estonia – the capital city Tallinn (128 kilometers). At the same time, the working places located in Pärnu city are very attractive to residents of other municipalities of Pärnu county, mostly because of the higher level of wages.

Interesting in this case is that 30–50% of the jobs provided locally are in the public sector (column 1), and the income earned from those working places adds up to 59% of the income from PIT revenues to the local government budget (column 2). This shows that many of the small municipalities are very dependent on the revenues earned in working places that are created mainly by the municipalities themselves.

Appendix 3 (columns 1 and 2) shows that, generally, the ratio of residents working in a municipality is higher than the ratio of PIT they are bringing to the municipal budget. So the low working share in their own municipality can be explained by the low wage levels across the county, making commuting to the center or outside the county more attractive. Additionally, very often, especially in smaller municipalities, only part-time work can be found.

In order to consider the attraction of the county center – Pärnu city – the share of municipal labor forces working in the center of their own county and the share of PIT they have brought to the budget of the municipality where they live is looked at next (column 3).

From column 3 we can see that the county center is an essential work provider for most of the municipalities in the county. The share of the labor force working in the center varies from 10% in the municipalities that are farther from the county center, have borders with other counties, and have centers of their own (Vändra, Häädemeeste, and also Kihnu island) to more than 30% in the neighboring municipalities (Sauga, Paikuse and Sindi).

It can also be seen from column 3 that people are commuting to the county center to work mostly in the private sector (76–100% of commuters).

Appendix 3 shows that the ratio of residents working in Pärnu city (column 3) is not much higher than the ratio of PIT they are bringing to the municipal budget of their residence municipality (column 4). In many cases it is even lower.

Thirdly, to see the overall picture of how the labor force of Pärnu county is moving around within their residence county, the share of the municipal labor force working outside the residence municipality but in the same county where they live (except Pärnu city) is looked at (column 5). The share of PIT they have brought to the budget of the municipality where they live is also calculated (column 6).

As can be seen from column 5, commuting within the county (except the center) is very low – generally under 10%, except for municipalities that are situated in the middle of the county between other municipalities but far from the county center or the county borders (Are, Tootsi, Lavassaare). The reasons why Vändra municipality belongs to this group are not clear – it needs more thorough study.

Commuting outside the county in this paper is divided into two: commuting to the capital city, Tallinn (working in organizations registered in Tallinn) and commuting to other counties (except Tallinn). The reason for this is that it is always not clear with the organizations that are registered in Tallinn whether those working places are really situated in Tallinn city, because large parts of them can also be situated outside Tallinn, including in Pärnu county. Those kinds of organizations are most likely chains of supermarkets, state government offices, and organizations with branch offices in other municipalities. The TCB data is based on the registration address of the organizations that provide jobs.

First looked at is the share of municipal labor forces working outside the county (Tallinn excluded) where they live (column 7) and the share of PIT they have brought to the budget of this municipality (column 8). Column 7 shows that there is not extensive working outside the residence county – the share is 8–12%. At the same time, it shows that workplaces outside the county (especially in neighboring counties) are essential to the labor forces of those municipalities situated far from the county center and bordering other counties (Varbla, Koonga, Häädemeeste,

Saarde and Vändra). The workplaces in other counties are not so attractive to those municipalities situated within the county – between other municipalities.

Column 8 shows that, if people choose to commute from their place of residence to another municipality to work, they choose jobs with higher incomes, i.e. employers in other municipalities are willing to buy in specialists with higher wages.

Secondly, in relation to commuting outside the county, we consider the share of municipal labor forces working in organizations whose registration address is in Tallinn city (column 9) and the share of PIT these commuters have brought to the municipality where they live (column 10). Column 9 shows that the share of the labor force working in those organizations is very high – about 25–35%. At the same time, it must be considered that those people may not be commuting to Tallinn (although it is possible) because their actual working place could be in the centre of the county – in Pärnu city.

From column 9 can be seen that there are more people in the county center and its surrounding municipalities who are working for organizations whose registration address is in Tallinn. Pärnu as the county center and also the third biggest municipality in Estonia attracts such organizations. The next category is benefiting municipalities that are situated next to the center. At the other end can be seen the municipalities that have no borders with the center – on the contrary they are situated far from the county center with at least one municipality intervening.

It can also be seen from column 10 that the wages in organizations that are registered in Tallinn (i.e. supermarket chains, branch offices etc) are much higher than in workplaces in small municipalities.

Work in organizations with registration address in Tallinn is also interesting because from column 9 it can be seen that there is almost no difference between working in the public or private sectors – the number of workplaces is divided 50/50 even though there are higher wages in the private sector.

For an overview of how much "potential" PIT income commuting takes away from municipal budgets, consider Appendix 4. It shows how much "potential" income is taken away from a municipality's budget by commuters living in the same county and also by commuters living outside the county.

First is looked at the share of workplaces in a municipality used by people living in the same county and the ratio of their PIT to the total PIT earned in those workplaces. Appendix 4 shows that in municipalities situated next to the county center are many workers from other municipalities in the same county (Audru, Paikuse, Sauga) but very few "foreign" laborers in those municipalities situated far from the county center (Saarde, Koonga, Varbla, Häädemeeste, and Tootsi).

Appendix 4 also shows that the ratio of commuters is generally lower than the ratio of PIT they are taking away from the municipal budget of their workplace municipality.

Finally is looked at the share of workplaces in a municipality used by people living outside the county and the ratio of their PIT to the total PIT earned in the workplaces of that municipality. From Appendix 4 it can be seen that less than 15% of commuters are coming from outside Pärnu county to work in Pärnu county and, when commuters are coming, they prefer the municipalities situated near the county center (Varbla and Saarde) or municipalities where there are bigger manufacturers (Sauga, Audru and Lavassaare). It can also be seen that the ratio of commuters is generally lower than the ratio of PIT they are taking away from the municipal budget of their workplace municipality.

Based on all of the data analyzed is Appendix 5. As can be seen from Appendix 5, the income from commuting is very essential to the municipalities of Pärnu county, as the PIT revenues from commuting add up to 30–80% of the PIT revenues in the municipal budget. It can also be seen that the influence of commuting on the municipal labor market is very high – up to 87% of local government inhabitants are commuting.

Appendix 5 shows that the influence of commuting is the smallest in the county center – Pärnu city. The most influenced by commuting are the budgets of municipalities with the smallest ratios of workplaces to labor force (Tootsi, Varbla, Surju). The greatest influence of commuting on the labor market is in those municipalities situated close to the county center (Paikuse, Sindi, Sauga).

Conclusions

The main aim of this paper was to discover the scope and intensity of commuting and its fiscal impact on local government budgets in Estonia in terms of revenues from personal income tax.

In Estonia, the work–residence discrepancy has a significant influence on municipal development, because the budget of the municipality where a worker lives receives 11.4% of PIT (from total 21% of PIT) as revenue, which on average amounts to up 50% of budget revenue.

To answer the research question, the literature about the nature of commuting was reviewed, then the methodology for the empirical analysis and issues of data gathering and analysis and the reliability of the data were discussed. Finally, the findings of the empirical analysis of commuting as a source of resource redistribution between municipal budgets were provided, followed by discussion of

the outcomes of the analysis and implications for the Estonian taxation system and fiscal equalization.

In this paper, commuting was considered from three aspects:

- going to work outside the residence municipality in the same county;
- going to work in the county center;
- going to work outside the residence county.

By taking into account the constraints on the data, mentioned in Part 3, we came into the following conclusions.

First, less than 40% of people work in the same municipality where they live, mainly because of the low levels of wages in the small rural municipalities. Also, because of these low wages, they are bringing only 10–30% of PIT revenues to municipal budgets.

The share of the labor force working in the county center varies from 10% in the municipalities farther from the center and with borders with other counties to more than 30% in neighboring municipalities.

At the same time, a great proportion of municipal PIT revenues (20–40%) is coming from workplaces provided by employers whose registration address is in the capital city, Tallinn, even though only 20–35% of inhabitants are working in those workplaces. Those employers may be chains of supermarkets or branches of state government organizations that are actually situated in the same county where the person lives.

Finally, it can be said that PIT revenues from commuting are essential to rural municipalities because they comprise up to 90% of their total PIT revenues.

The results of this paper have confirmed that commuting is a growing feature of economics and should be studied more thoroughly. At the same time, there should be changes in municipal management so that municipalities that are connected by commuting (like a city and its neighboring rural municipality) should seriously consider mergers.

This is the first time that this kind of data has been made available for scholarly studies, so this paper has described a general picture of the scope and intensity of commuting and its influence on municipal development. Further studies on this matter should look more deeply into the problem – the why question. In addition, the possible financial impact of planned mergers of municipalities based on commuting should be examined.

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Apendix 1. The structure of municipal budget revenues in 2011 (in %)

Type of revenue	Average share of municipal budget
Personal income tax (PIT)	46.7
Block grants from central government budget	17.10
Fees	10.83
Other revenues	8.77
Budget equalization allocations from central government budget	5.45
Land tax	4.74
Grants from ministries to municipalities for special purpose	2.19
Environmental fees	1.21
Income from property	0.89
Local taxes	0.73

Source: Ministry of Finance

Appendix 2. General characteristics of municipalities in Pärnu county

Municipality	Number of inhabitants	Area of municipality (km2)	Density of municipality (inhabitants per km2)	Number of working inhabitants	Share of labor force among inhabitants (%)	Number of working places in municipality	Ratio of working places to labor force (%)	Distance from the municipal centre to the county centre (km)	Distance from the municipal centre to Tallinn (km)
Average Estonian municipality	5 928	200	30	n/a	n/a	n/a	n/a	n/a	n/a
Are	1 281	160	8	512	40	165	32	20	110
Audru	5 477	379	14	2 247	41	1 293	58	13	131
Halinga	3 197	365	9	1 471	46	738	50	30	101
Häädemeeste	2 875	390	7	1 039	36	482	46	40	166
Kihnu (an island)	713	17	42	294	41	129	44	58	176
Koonga	1 222	438	3	450	37	194	43	44	142
Lavassaare	524	8	66	223	42	123	55	28	139
Paikuse	3 933	177	22	1 785	45	801	45	8	134

Pärnu city	42 685	32	1 326	18 021	42	15 227	84	0	126
Saarde	4 500	707	6	1 613	36	775	48	40	168
Municipality	**Number of inhabitants**	**Area of municipality (km2)**	**Density of municipality (inhabitants per km2)**	**Number of working inhabitants**	**Share of labor force among inhabitants (%)**	**Number of working places in municipality**	**Ratio of working places to labor force (%)**	**Distance from the municipal centre to the county centre (km)**	**Distance from the municipal centre to Tallinn (km)**
Sauga	4 015	165	24	1 863	46	936	50	8	120
Sindi city	4 248	5	848	1 838	43	711	39	12	136
Surju	1 066	358	3	444	42	177	40	22	148
Tahkuranna	2 331	103	23	931	40	499	54	21	147
Tootsi	816	2	429	334	41	91	27	37	118
Tori	2 482	282	9	1 031	42	575	56	26	118
Tõstamaa	1 460	261	6	535	37	217	40	50	169
Varbla	957	314	3	329	34	143	43	71	145
Vändra	2 945	642	5	1 175	40	539	46	47	110
Vändra alev	2 544	3	795	1 172	46	879	75	48	111

Source: Estonian Statistics Office and Estonian Tax and Customs Board, complied by authors

Appendix 3. Movement of labor force between the municipalities (in %)

Local government	Municipality 's labor force working in the same municipality as they live (column 1)			Share of PIT they have brought into LG budget they live (column 2)			Municipality 's labor force working in the centre of own county (column 3)			Share of PIT they have brought into LG budget they live (column 4)			Municipality 's labor force working outside of municipality but in the same county they live (except the center) (column 5)			Share of PIT they have brought into LG budget they live (column 6)			Municipality 's labor force working outside the county (Tallinn city excluded) they are living (column 7)			Share of PIT they have brought into LG budget they live (column 8)			Municipality 's labor force working in organizations which registration address is in Tallinn city (column 9)			Share of PIT they have brought into LG budget they live (column 10)		
	Total	in public sector	in private sector	Total	in public sector	in private sector	Total	in public sector	in private sector	Total	in public sector	in private sector	Total	in public sector	in private sector	Total	in public sector	in private sector	Total	in public sector	in private sector	Total	in public sector	in private sector	Total	in public sector	in private sector	Total	in public sector	in private sector
Are	21	46	54	18	42	58	25	12	88	27	15	85	14	0	100	15	0	100	8	16	84	10	14	86	31	51	49	31	48	52
Audru	23	36	64	20	33	67	29	10	90	28	11	89	8	9	91	8	7	93	10	16	84	11	16	84	31	46	54	33	37	63
Halinga	36	33	67	32	35	65	16	7	93	16	7	93	9	8	92	9	6	94	9	15	85	10	13	87	30	48	52	33	37	63
Häädemeeste	35	44	56	29	49	51	13	10	90	13	8	92	8	9	91	8	8	92	12	12	88	13	8	92	31	50	50	36	45	55
Kihnu	30	48	52	25	47	53	14	16	84	14	16	84	7	45	55	7	31	69	11	24	76	11	43	57	37	48	52	43	31	69
Koonga	34	50	50	29	57	43	15	8	92	15	7	93	9	19	81	10	19	81	14	19	81	15	16	84	28	50	50	30	42	58
Lavas-	23	42	58	21	31	69	25	6	94	26	7	93	21	10	90	25	11	89	7	17	83	6	6	94	24	56	44	22	44	56

saare																														
Paikuse	16	33	67	12	38	62	32	13	87	31	15	85	7	19	81	7	15	85	9	14	86	11	14	86	35	53	47	39	46	54
Pärnu city	49	19	81	46	22	78	49	19	81	46	22	78	8	15	85	8	16	84	9	12	88	10	12	88	34	44	56	36	38	62
Saarde	38	34	66	33	39	61	15	24	76	16	28	72	6	15	85	6	15	85	12	15	85	14	12	88	30	54	46	31	51	49
Sauga	13	30	70	10	28	72	34	14	86	34	13	87	8	14	86	8	13	87	9	14	86	9	15	85	35	48	52	39	38	62
Sindi city	19	31	69	17	32	68	32	15	85	32	18	82	9	11	89	8	13	87	8	9	91	10	4	96	32	48	52	33	37	63
Surju	29	48	52	23	44	56	26	9	91	29	9	91	8	27	73	8	27	73	9	12	88	10	8	92	29	56	44	31	57	43
Tahku-ranna	23	29	71	19	26	74	28	12	88	27	15	85	9	16	84	9	13	87	9	14	86	10	17	83	31	46	54	34	40	60
Tootsi	23	53	47	16	61	39	28	1	99	39	0	100	15	4	96	13	5	95	4	13	88	4	4	96	30	55	45	28	52	48
Tori	35	21	79	33	22	78	16	8	92	18	10	90	10	12	88	10	12	88	9	14	86	10	9	91	29	50	50	30	44	56
Tõsta-maa	31	42	58	21	45	55	19	6	94	17	5	95	8	16	84	9	15	85	10	19	81	12	12	88	32	45	55	40	39	61
Varbla	28	51	49	20	59	41	15	8	92	14	5	95	9	17	83	9	16	84	16	24	76	17	23	77	32	49	51	40	40	60
Vändra	29	31	69	25	29	71	11	0	100	12	0	100	20	21	79	19	22	78	11	12	88	13	9	91	29	50	50	31	39	61
Vändra alev	37	32	68	32	28	72	16	2	98	18	2	98	11	25	75	10	22	78	10	19	81	13	16	84	26	49	51	27	39	61

Source: Estonian Tax and Customs Board, calculated by authors

Appendix 4. "Potential" personal income that commuting takes out from the municipal budget

Local government	Share of working places exploited by labour force living in the same county	Share of "potential PIT" they are taking out of the municipality	Share of working places exploited by labour force living outside Pärnu county	Share of "potential PIT" they are taking out of the municipality
Are	31	41	4	4
Audru	45	48	15	16
Halinga	18	21	10	12
Häädemeeste	14	15	10	11
Kihnu	21	23	10	12
Koonga	13	14	7	7
Lavassaare	42	52	16	16
Paikuse	54	53	11	13
Pärnu city	29	30	13	15
Saarde	7	7	15	15
Sauga	62	65	13	13
Sindi city	41	42	10	13
Surju	24	25	4	3
Tahkuranna	45	44	12	15
Tootsi	14	12	2	5
Tori	30	32	7	7
Tõstamaa	19	20	4	4
Varbla	13	19	21	17
Vändra	25	28	12	11
Vändra alev	37	35	14	14

Source: Estonian Tax and Customs Board, calculated by authors

Appendix 5. Influence of commuting

Local government	Total amount of money earned by LG residents (per month, EUR)	Amount of money earned by the inhabitants from outside the LG (per month, EUR)	Amount of money taken out from the LG by commuters (per month, EUR)	Net influence of commuting (per month, EUR)	Net influence of commuting per inhabitant (per month, EUR)	Net influence of commuting in LG PIT income (%)	Influence of commuting in LG labour force market (%)
Are	299 546	244 811	44 586	200 225	156,36	67	79
Audru	1 497 956	1 192 754	540 592	652 162	119,07	44	77
Halinga	947 842	640 681	148 808	491 873	153,88	52	64
Häädemeeste	644 935	459 895	65 745	394 150	137,12	61	65
Kihnu	208 979	155 836	28 744	127 092	178,25	61	70
Koonga	252 705	178 547	19 568	158 979	130,15	63	66
Lavassaare	131 137	103 775	58 299	45 477	86,79	35	77
Paikuse	1 276 497	1 119 422	308 917	810 505	206,10	63	84
Pärnu city	12 018 938	6 458 024	4 428 841	2 029 184	47,54	17	51
Saarde	1 024 895	684 531	96 801	587 730	130,62	57	62
Sauga	1 260 703	1 134 454	458 667	675 787	168,34	54	87
Sindi city	1 122 989	933 965	235 134	698 831	164,53	62	81

Local government	Total amount of money earned by LG residents (per month, EUR)	Amount of money earned by the inhabitants from outside the LG (per month, EUR)	Amount of money taken out from the LG by commuters (per month, EUR)	Net influence of commuting (per month, EUR)	Net influence of commuting per inhabitant (per month, EUR)	Net influence of commuting in LG PIT income (%)	Influence of commuting in LG labour force market (%)
Surju	292 799	226 653	26 253	200 400	188,08	68	71
Tahkuranna	661 858	533 462	184 697	348 765	149,62	53	77
Tootsi	226 816	189 765	7 440	182 325	223,57	80	77
Tori	685 279	461 197	139 648	321 550	129,58	47	65
Tõstamaa	346 120	271 794	23 410	248 385	170,18	72	69
Varbla	220 398	176 360	24 604	151 756	158,66	69	72
Vändra	719 972	539 972	112 255	427 717	145,23	59	71
Vändra alev	810 133	550 045	253 624	296 421	116,54	37	63

Source: Estonian Tax and Customs Board, calculated by authors

PENDELRÄNNE KUI EESTI KOHALIKU OMAVALITSUSE FINANTSIDE MÕJUTAJA[1] [2]

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Regioonid võistlevad omavahel pidevalt elanike pärast. Seoses inimeste mobiilsuse kasvuga muutub see konkurets järjest teravamaks. Mobiilsuse oluliseks ja üha tntensiivistuvaks osaks on inimeste pendelränne erinevatesse regioonidesse jääva elu- ja töökoha vahel. Käesoleval juhul on vaatluse all pendelränne mikroregioonide – kohalike omavalitsusüksuste – vahel. Eestis on pendelrändel suur mõju inimeste sissetulekutele ja seega ka kohalike omavalitsuste eelarvete maksutuludele. Seda mõju ei ole senini akadeemilises kirjaduses piisavalt uuritud. Käesoleva artikli eesmärgiks on hinnata pendelrände mõju ulatust kohaliku omavalitsuse (KOV) eelarve maksutulude kujunemisele. Eesti Maksu- ja Tolliameti andmetele baseerudes leiti Pärnumaa KOV-de elanike pendelrännet käsitlevas uurimuses, et see mõju võib ulatuda kuni 80%-ni KOV eelarve füüsilise isiku tulumaksu laekumisest.

Artiklis vaadeldakse pendelrände mõjusid KOV eelarve füüsilise isiku tulumaksu laekumisele kolmest aspektist lähtuvalt. Esiteks uuritakse omavalitsusüksuste elanikkonna pendelrände mõju KOV eelarve tuludele füüsilise isiku tulumaksust:

- Inimeste osakaal omavalitsusüksuse töötavast elanikkonnas, kes on hõivatud väljaspool koduvalda või -linna, kuid oma kodumaakonnas ning nende poolt KOV eelarvesse toodava füüsilise isiku tulumaksu osakaal kogu tulumaksu laekumises;
- Inimeste osakaal omavalitsusüksuse töötavas elanikkonnas, kes on hõivatud maakonna keskuses ning nende poolt KOV eelarvesse toodava füüsilise isiku tulumaksu osakaal kogu tulumaksu laekumises;
- Inimeste osakaal omavalitsusüksuse töötavas elanikkonnas, kes on hõivatud väljaspool kodumaakonda ning nende poolt KOV eelarvesse toodava füüsilise isiku tulumaksu osakaal kogu tulumaksu laekumises.

Teiseks vaadeldakse pendelrändajaid, kes tulevad omavalitsusüksusse tööle väljastpoolt ning osakaalu nn potentsiaalsest füüsilise isiku tulumaksu summast, mis nende pendelrändajate poolt omavalitsusüksusesest välja viiakse.

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Kolmandaks analüüsitakse Tallinna mõju pendelrändele ning KOV eelarve füüsilise isiku tulumaksu laekumisele.

Füüsilise isiku tulumaksul on Eesti KOV eelarves suur tähtsus, sest KOV eelarvesse laekub peamine osa omavalitsusüksuse elaniku füüsilise isiku tulumaksust, mis moodustab 11,4% elaniku töisest brutotulust. Kokkuvõttes moodustab füüsilise isiku tulumaks keskmiselt veidi vähem kui poole Eesti KOV eelarvetulust.

Uurimiseesmärgi saavutamiseks analüüsiti kõigepealt pendelrände mõju käsitlevat teaduskirjandust, koostati metodoloogia andmete empiiriliseks analüüsiks ning hinnati andmete usaldusväärsust pendelrände poolt KOV eelarvele avaldatava finantsmõju väljatoomisel.

Empiirilise analüüsi aluseks on võetud Pärnu maakond, kuna seda maakonda võib hinnata Eesti keskmiseks järgnevatest parameetritest lähtudes:

- Maakonna omavalitsusüksuste keskmine suurus on enam-vähem Eesti keskmisel tasemel (välja arvatud Pärnu linn);
- Kaugus Tallinnast;
- Töötava elanikkonna osakaal omavalitsusüksuse elanikkonnas.

Kõigepealt hinnati koduvallas või -linnas töötavate inimeste osakaalu omavalitsusüksuse töötavas elanikkonnas ning nende füüsilise isiku tulumaksu osakaalu koduomavalitsuse eelarves. Analüüsi tulemustest ilmnes, et mida lähemal maakonna keskusele omavalitsusüksus asub, seda väiksem osa tema töötavast elanikkonnast on hõivatud koduvallas või –linnas. Keskmiselt töötab koduomavalitsusüksuses alla 40% tööga hõivatud elanikest. Selle põhjuseks on tõenäoliselt väikseid maavaldasid iseloomustav madal palgatase ning sobivate töökohtade puudus. Madala palgataseme tulemusena toob keskmiselt 40% koduvallas või –linnas töötavast elanikkonnast vaid 10-30% KOV eelarvesse laekuvast füüsilise isiku tulumaksust.

Huvitav on ka asjaolu, et 30-50% koduvalla või –linna töötavatest elanikest on hõivatud avalikus sektoris ja nad toovad KOV eelarvesse kuni 59% füüsilise isiku tulumaksu laekumistest. Seega olenevad KOV eelarvetulud suuresti KOV enda poolt loodud avaliku sektori töökohtadest.

Järgmisena hinnati maakonnakeskuses töötavate elanike osakaalu omavalitsusüksuse tööga hõivatud elanikkonnas ning nende poolt teenitud tulult laekuva füüsilise isiku tulumaksu osakaalu KOV eelarve füüsilise isiku tulumaksu kogulaekumises. Analüüs näitas, et töötava elanikkonna osakaal, kes on hõivatud maakonnakeskuses varieerub 10%st (keskusest kaugemal asuvates valdades) kuni 30%ni (keskusega piirnevates valdades). Maakonnakeskuses töötavate elanike poolt KOV eelarvesse toodava füüsilise isiku tulumaksu osakaal kogu maksutuludes on enam-vähem võrdne maakonnakeskuses hõivatud omavalitsusüksuse töötava elanikkonna osakaaluga -- 10-30%. Maakonnakeskuses tööl käivad elanikud töötavad peamiselt erasektoris -- 76-100% erinevate omavalitsusüksuste pendelrändajatest.

Pendelränne kodumaakonna piires moodustas üldjuhul veidi üle poole (50-60%) pendelrändajate koguarvust. Kodumaakonnas pendelrändajate osakaal on kõrgem neis omavalitsusüksustes, mis asuvad maakonna keskel ning väiksem omavalitsusüksustes, mis asuvad maakonna piiril. Viimaste omavalitsusüksuste elanikud pendelrändavad üldjuhul väljapoole kodumaakonda.

Pendelränne väljaspoole kodumaakonda jaotub kaheks: töötamine väljaspool Tallinna registreeritud ettevõtetes (organisatsioonides) ning töötamine Tallinnas registreeritud ettevõtetes (organisatsioonides).

Väljaspool Tallinna registreeritud ettevõtetes töötajate osakaal on suhteliselt väike – 4-14% erinevate omavalitsusüksuste töötavast elanikkonnast. Peamiselt töötavad väljaspool Tallinna registreeritud organisatsioonides elanikud neist omavalitsusüksustest, mis asuvad maakonna äärealadel.

Oluline osa KOV eelarve füüsilise isiku tulumaksust (20-40%) tuuakse sisse nende elanike poolt, kes töötavad Tallinnas registreeritud organisatsioonides. Pendelrände ulatuse hindamisel seisneb probleem aga selles, et Tallinnas registreeritud ettevõtete (organisatsioonide) töökohad ei pea asuma Tallinnas. Näiteks asuvad suurte kaubanduskettide kauplused või valitsusorganisatsioonide kohalikud osakonnad laiali kogu riigis, sh vaatluse all olevas Pärnu maakonnas.

Pendelrännet tuleb analüüsida ka sellest aspektist, kui palju vaatlusaluse omavalitsusüksuse töökohtadest on hõivatud ja kui suure osa KOV eelarve "potentsiaalsest tulust" viivad füüsilise isiku tulumaksuna välja väljastpoolt omavalitsusüksust tulnud pendelrändajad. Analüüsi tulemused on järgmised:

- 7-62% Pärnu maakonna omavalitsusüksuste töökohtadest on hõivatud Pärnu maakonda teistest omavalitsusüksustest tulnud pendelrändajate poolt ja nad viivad KOV eelarvest välja 7-65% „potentsiaalsest" füüsilise isiku tulumaksu laekumisest;
- 2-21% Pärnu maakonna omavalitsusüksuste töökohtadest on hõivatud väljastpoolt Pärnu maakonda tulnud pendelrändajate poolt ja nad viivad KOV eelarvest välja 3-17% „potentsiaalsest" füüsilise isiku tulumaksu laekumisest.

Seega on omavalitsusüksuste olukord oma elanikkonna hõivamisel väga erinev, mistõttu on oluliselt varieeruv ka hõivatud pendelrändajate osatähtsus töötajaskonnas.

Kokkuvõttes tõi käesolev analüüs välja asjaolu, et pendelränne mõjutab KOV eelarve sissetulekut füüsilise isiku tulumaksust väga suurel määral – elanike pendelrändest sõltub 30-80% erinevate KOV-de eelarvete füüsilise isiku tulumaksu laekumisest. Pendelrände mõju on väikseim maakonna keskuse Pärnu eelarvelaekumistes. Pendelrände poolt on kõige enam mõjutatud need omavalitsusüksused, kus pakutavate töökohtade arv on võrreldes tööealiste elanike arvuga väike.

Käesoleva uurimise tulemused kinnitavad, et pendelrändel on oluline roll mitte ainult tööturu aspektist, vaid ka KOV eelarvete tulubaasi aspektist hinnatuna. Pendelrände seost KOV eelarve sissetulekute ja väljaminekutega peab uurima senisest põhjalikumalt, et tagada selle tasakaalustatud mõju omavalitsusüksuste majanduslikule ja sotsiaalsele arengule. Pendelrände kaudu tihedalt seotud tööturuga omavalitsusüksused peaksid tõsiselt kaaluma ühinemist.

Käesolevas uurimuses keskenduti pendelrände üldise finantsmajandusliku mõju analüüsile. See mõju osutus väga oluliseks. Edasised uuringud peaks suunama pendelrännet mõjutavate tegurite ja tingimuste väljaselgitamisele, et seda olulist majandusarengu mõjurit sihipäraselt suunata. Valitsustasandil peaks administratiiv-territoriaalset reformi ette valmistades süsteemselt analüüsima ka pendelrändest tulenevat mõju KOV eelarve tulu- ja kulupoolele.