# SELECTED ISSUES OF COMMUTING IN SLOVAKIA

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**Abstract**

On the one hand, commuting is considered to be one of the least enjoyable activities within the time allocation of an individual. On the other hand, it is a prerequisite for the flexibility of the labour supply. The aim of the paper is to quantify travel time costs and monetary costs of commuting in Slovakia. Commuting costs may also include other costs that affect the utility of travel. Existing researches declare that in terms of wellbeing, individuals with longer commute times are systematically worse of. It also depends on the mode of transport they usually use. The findings of the study are based on data obtained by the primary survey. The authors concluded that Slovaks are among the countries with lower time costs. They also found out that there is dependence between the length of commuting and the net monthly income of respondents.

**Keywords**

Commuting, Paid Work, Time Costs, Monetary Costs, Mode of Transport

## I. Introduction

During the day, employed individuals allocate time to multiple activities that are diverse and often differentiated with respect to their preferences in life. Full-time work in the Slovak Republic is normally eight hours a day. According to the Labour Code, the working time of an employee in Slovakia is at most 40 hours a week. Full-time work is normally 8 hours a day, which may be less or more depending on the type of employment. Part of the lives of many employed Slovaks is also work during the weekends or nightshifts and overtimes, whether paid or unpaid. The amount of time spent in work or otherwise, by working is not the only time that paid work takes. Transport to the place of work also requires time costs of commuting in addition to choosing the mode of transport.

If we consider a time allocation of working individuals, we can divide it into time spent on paying work (working hours, overtime (paid, unpaid)), time spent doing unpaid work (housework) and leisure time activities. Knapková and Kaščáková (2018) aggregated paid activities and traveling to and from work by examination of the time use of single-member households in Slovakia. According to Wheatley and Wu (2014) commuting time is a necessary work-related activity, but is distinct from work-time.

Commuting is of strategic importance in daily living of individuals and households. It links personal life and working life, enables reach and access on the labour market, and can manifest gendered relationships between women and men. Accordingly, commuting is a concern at both the individual and household levels as well as for policy and planning at various levels (Solá, 2016).

Basmajian (2010, p. 77) presumes commuting as a “fluid experience equally blended into home life and work-place and points in between”.

In general, commuting is considered to be one of the least enjoyable activities within the time allocation of an individual (Humphreys et al., 2013; Kahneman et al., 2004 in: Guidon et al., 2019). There are at least two types of costs that must be beared. The first is the "loss" of time

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caused by moving from home to work-place (with the exception of the "home office"). It is therefore clear that individuals face implicit costs, but they often do not even realize it immediately. The second type of costs that employed individuals have to deal with is explicit costs. These represent all expenses related to commuting and may vary, which of course depends on the distance and transport mode.

This raises the question as to how commuting is compensated for. Stutzer and Frey (2008) use classical economic theory to conclude that a longer commute time and the associated additional psychological burden should either be compensated for by a more rewarding job (intrinsically or financially) or by additional welfare from a more attractive living situation (price, size, comfort etc.). Previous research provides a strong relationship between housing prices and distance to job opportunities and longer commutes are associated with higher wages (Ommeren et al., 2000). However, in terms of reported subjective wellbeing, Stutzer and Frey (2008) find that individuals with longer commute times are systematically worse off.

In the Slovak Republic, there is only a little attention paid to examining the outlined issues, and the findings are the result of a variety of surveys and questioners that do not have the relevant testimony. We therefore believe that closer knowledge and quantification of the length of time spent by commuting as well as the related expenses can provide a more comprehensive microeconomic view of the labour supply. The same is true of the preferred modes of transport used by Slovaks. The results of the labour mobility investigation so far have been insufficient in these intentions.

Given that at present it is possible to observe the shortage of labour in several sub-labour markets in Slovakia (health, education, industry) and the continuing regional disparities between the "strong" west and the "weak" east of Slovakia (Kollár et al., 2018), deepening knowledge of individual behavior and the labour supply of households is crucial not only for public policies but also for the private sector. Similarly, the results of this knowledge may be useful for the future development of the territory, which should be based, inter alia, on the behavior of economic subjects.

Although the Slovak Republic is a small open economy, there are eight self-governing regions in its territory that differ not only in terms of the number of employers and the structure of the labour supply, but also in the different geographic location and size, population density and technical infrastructure that may be benefits as well as possible barriers to commuting. In addition, there are other objective factors (e.g. fuel prices) that affect the travel mode and time of commuting. Deepening the knowledge of decision-making by Slovaks following the allocation of time and travel mode of commuting can help to better understand the functioning of the labour market, especially in terms of supply, and thus to "set" public policies more directly.

As in the current paper, we aim to estimate individuals' marginal costs of commuting, we resume these costs include travel time costs and monetary costs, but they may also include other costs that affect the utility of travel (e.g. stress). Commuting costs play an important role in hundreds of studies that contribute to urban economics theory (e.g. Wheaton, 1974; Fujita, 1989; Van Ommeren and Fosgerau, 2008).

## II. Literature review

Commuting patterns, and travel demand in general, hinge on a number of factors, including various socioeconomic features of individuals and households (Hanson and Prat, 1988; Mazúrová et al., 2017) as well as the characteristics of urban form (built environment) (Giuliano and Small, 1993; Small, 2005). As it is stated by Guidon et al. (2019, p. 333) commuting is a consequence of the combined choice of home and work location. Thus, individuals trade-off between commute time and distance, the characteristics of home and work location and

opportunities that arise by combining the commute with other activities (such as shopping on the way home).

In modelling travel behaviour, it is universally assumed that commuting is a source of disutility. This raises the question as to how commuting is compensated for. As we mentioned above a longer commute time and the associated additional psychological burden should either be compensated for by a more rewarding job (intrinsically or financially) or by additional welfare from a more attractive living situation (price, size, comfort etc.). Previous research provides a strong relationship between housing prices and distance to job opportunities and longer commutes are associated with higher wages (Ommeren et al., 2000). However, in terms of reported subjective wellbeing, Stutzer and Frey (2008) declare negative correlation between commuting and subjective wellbeing which means that individuals with longer commute times are systematically worse off.

Long journeys appear to have negative impacts on subjective wellbeing, especially because of stress and tiredness also according to other authors (e.g. Sullivan, 2007, Lyons and Chatterjee, 2008, Olsson, Garling, Ettema, Friman and Fujii, 2013).

A number of researchers (reviewed in Salomon and Mokhtarian 1998 in: Redmond and Mokhtarian, 2001), however, have noted that travel can offer also a positive utility in its own right. They point out that the utility for travel has three components: the utility for the activity at the destination, the utility for activities that can be conducted while traveling, and an enjoyment of the act of travel itself. Martin et al. (2014) propose that active commuting (e.g. walking and cycling) is associated with higher wellbeing and a reduced likelihood for certain psychological symptoms. But for drivers, the authors still observe a clear disutility.

There are other studies that have not found a negative correlation between satisfaction with life and commuting, but suggest that commuting is associated with lower satisfaction with specific aspects, including family and leisure time (e.g. Lorenz, 2018). Roberts et al. (2011) state, that commuting has a negative effect on psychological health, but only for women. This may be due to higher family commitments and home care. Morris et al. (2018) report no association between commute time and life satisfaction of individuals.

According to Sweet and Kanaroglou (2016, p. 24) identifying how travel and time use outcomes are linked with subjective wellbeing has important implications if improving quality of life is to be a meaningful planning policy goal. First, it provides guidance on what types of travel outcomes planners should target to improve subjective wellbeing. Second, it identifies what types of time use and activity participation outcomes can improve subjective wellbeing. Third, it can provide evidence on whom common existing policy actions and objectives are most likely to benefit.

Difficulty and ambiguity of the issue reflect e.g. Haas and Osland (2004); they report there is no unambiguous theory that provides a comprehensive picture of the relationship between commute time and subjective wellbeing.

## III. Methodology and data

The aim of the paper is to quantify travel time costs and monetary costs of commuting in Slovakia. We also try to identify the travel mode of respondents in our research. Within the framework of the project VEGA No. 1/0621/17 "Decision-making Process of Slovak Households about Allocation of Time for Paid and Unpaid Work and Household Strategies´ Impact on Selected Areas of the Economic Practice" at the Faculty of Economics, Matej Bel University in Slovakia, we conducted a primary survey using a questioning method using a questionnaire. Questionnaires were distributed to Slovak households in April - May in 2018 and consisted of several parts, resp. modules that aimed to find out more information

(selected aspects of paid work, structure of unpaid work, division of roles in the household and others) both about Slovak households and about individuals in them. In particular, the uniqueness of the survey is that it provides aggregated data that cannot be obtained from available official statistics. By evaluating and comparing them, it is possible to stimulate a social debate in selected areas. We focused only on evaluating the part of the questionnaire in the area of paid work (seventh module) in which the questions for respondents were focused on paid work, commuting to and from work, travel expenses as well as other categories of paid work. Only the respondents who were employed at the time of the questionnaire survey filled in this questionnaire module. Other respondents such as retirees, students, women resp. men on maternity leave and others did not fill this part of the questionnaire. The questionnaire was representative of the gender, age and education of respondents. The questionnaire was distributed to 732 households and was attended by a total of 1,819 respondents. Our evaluated sample of 1,043 respondents consisted only of employed individuals who had at least one paid job at the time. With regard to the goal of the paper, we have used simpler mainly descriptive statistical methods, which have resulted in a unique result for the first time ever. To determine the correlation between time costs of commuting and net income of respondents, we used Spearman's correlation coefficient.

## IV. Results and discussion

Commuting to and out of work is the time spent on traveling from home to work-place and back. Transnational official statistics in this case is provided by e.g. OECD, which evaluates commuting, but not from the point of view of the net traveling time to and from work. These statistics also includes commuting of students to school or accompanying the child to school. It is possible to find out from the available sources that the length varies. During the period 1999-2014 they recorded the most time spent by commuting (about 60 min/day) in Korea, China, Japan and Turkey. In countries such as Spain, Finland and Sweden are time costs lower (about 30 min/day) (OECD). Data for the Slovak Republic are missing in official transnational statistics.

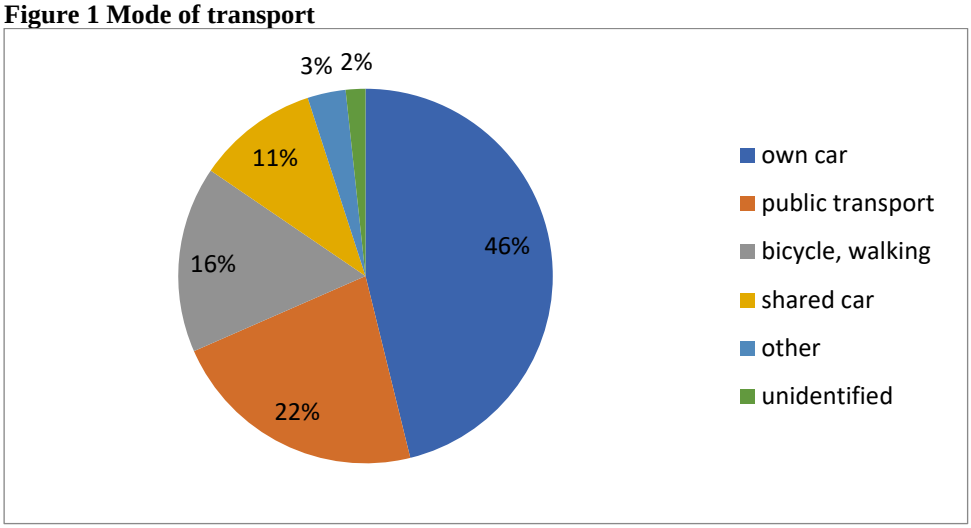
By evaluating the part of the questionnaire in 2018, we concluded that the average net commute time of respondents was 4 hours a week, resp. 34 minutes a day. The standard deviation is relatively high (3.75 hours/week), suggesting a significant variability among respondents. This is not surprising given the different modes in which respondents are transported. The median of commuting is 3 hours per week. These results correspond to our findings in the previous period (e.g. Kollár, Mazúrová, Nedelová, 2018). Based on this, we can state that Slovakia is one of the countries with lower time costs of commuting. We consider the length of time for commuting is one of the key categories that play an essential role in day-to-day mobility decision-making, similar to Ommeren and Fosgerau (2009).

In addition to the time spent on commuting (the implicit time costs), equally important is spending on travel (the explicit monetary costs), which reduces household disposable income. Based on the results of our survey, we note that the average weekly travel expenses of our respondents were 12.5 € per week. The median value was 9 €.

Commuting costs are related to the mode of transport. Based on the results of our survey, we can identify the modes of transport of respondents. We are not able to determine what influenced the decision-making of respondents about the mode of transport as well as we do not know any restrictions that would limit respondents. However, we assume that an individual tries to minimize time costs as well as monetary costs of commuting. Our assumption is based on the time allocation theory, which assumes its rational use with limited income (Meester, Mulder, Fortuijn, 2007).

Figure 1 shows the proportion of different modes of transport used by respondents.

**Figure 1 Mode of transport**




*Source: own processing using primary data from the VEGA Project. No. 1/0621/17*

Figure 1 shows that almost half of respondents use their own car when commute. Not a quarter of respondents use public transport, which we consider to be very low. We assume that, given the relatively high cost and low quality of public transport services provided, it is more advantageous for respondents to commute using their own cars. 16 % of respondents who commute using a bicycle or by walk are more positive. Given that Slovakia is still characterized by a small number of towns and villages with well-built cycling routes, this proportion surprised us. On the other hand, given the fact that cycling or walking commuting is the most appropriate way in terms of the impact of commuting to the wellbeing of the individual as well as the environmental burden, we consider the 16 % proportion to be very low. Only about 10 % of respondents use a shared car, which we also consider to be a low proportion of the used modes of transport. Other mode of transport may be using of a company car or a taxi. Unidentified are those who did not answer this question in the questionnaire, e. g. those who have a home office.

From the results of the analysis of the data it is clear that the respondents commute most often by their own car. According to Buehler (2013), employed individuals with free parking in paid work unambiguously prefer to commute by their own car. Similar conclusions were reached by Hamre and Buehler (2014), who declare more frequent use of their own car compared to public transport in case that the employer reimburses part of their travel expenses and provides employees with free parking at the place of work. Bole and Gabrovec (2005) have even concluded that people who for any reason cannot use their own car are often confronted with a reduced chance to become involved in the labour market, contributing to greater social exclusion from society.

The fact that almost half of the respondents use their own car may also be the result of the efforts of employed individuals to eliminate the negative effects of commuting. According to Kollár et al. (2018) commuting to and from work affects individuals' private lives, with a difference between men and women. A surprising finding was that commuting affects men more than women.

Table 1 gives a comparison of the mode of transport and the related travel monetary costs as well as the length of commuting.

**Table 1 Time costs and monetary costs of commuting according to the mode of transport**

| Mode of transport | Average weekly monetary costs of commuting in € | Average weekly time costs of commuting in hours |
|---|---|---|
| Own car | 19, 53 | 4,19 |
| Public transport | 8, 85 | 4 |
| Bicycle, walking | 0, 72 | 1,97 |
| Shared car | 10, 83 | 4,77 |
| Other | 10 | 5,98 |

*Source: own processing using primary data from the VEGA Project. No. 1/0621/17*

The results of our research show a number of hitherto unknown, more exacting knowledge and interrelationships in commuting in Slovakia. In the case of employed respondents commuting by their own car, travel expenses are on average over € 80 per month, with weekly time costs more than 4 hours. Compared to commuters using a shared motor vehicle (basically the mode of transport is identical), monthly spending is about half as low. The time spent by commuting is about 35 min. per week. So we believe that the way of shared travel is used by individuals who have to spend more time in commuting, resp. overcome a greater distance. In case the respondents use public transport for commuting, the time costs approximately 4 hours per week correspond to the use of their own car. The average monthly expenses associated with this are approximately 35 €.

If the respondents commute using a bicycle or by walking, it takes them on average 2 hours per week. It is clear that this mode of transport is used by employed individuals at shorter distances. This assumption is also confirmed by the study of Bueno et al. (2017), who concluded that cycling or walking is typical especially when overcoming short distances. However, even in this case, the respondents are explicitly charged with the costs of bike maintenance, but we have not followed this fact closely. We consider the greatest limitation in our research to be the absence of distance detection that is overcome in the context of commuting. In the future, we will also focus on this aspect.

As the income from paid work of respondents is likely to become one of the sources of funds for travel expenses, we assume that its amount will also affect the mode of transport. We also assumed that individuals with higher incomes are willing to commute longer. The results of the survey are presented in Table 2. We surveyed the average net monthly income of employed individuals in interval values due to the sensitivity of the surveyed data and in order to get as many answers as possible.

**Table 2 Selected issues of commuting in relation to average net monthly income of respondents**

| Net monthly income in € | Average monthly monetary costs of commuting in € | Average monthly time costs of commuting in hours | The most common mode of transport |
|---|---|---|---|
| up to 500 | 25 | 9,7 | own car |
| from 500 to 700 | 41 | 14 | own car |
| from 700 to 900 | 50 | 15 | own car |
| more than 900 | 70 | 20 | own car |

*Source: own processing using primary data from the VEGA Project. No. 1/0621/17*

By evaluating the primary data from our survey, we have found several findings and interrelationships. We note that the most frequently used mode of transport within all our

income categories is own car of respondents. It is also clear from the table that the higher the monthly income of individuals is, the higher time costs and monetary costs of commuting are. We were particularly interested in the fact that respondents with a net monthly income over 900 euros commute twice as long as those whose net monthly income is up to 500 euros. The interdependence between time costs of commuting and the income of respondents was also verified using Spearman's correlation coefficient. By evaluating primary data through Excel, we conclude that its value is 0.42, which is most often interpreted as a slight dependence between variables. Thus, we can confirm our assumption that, with increasing income, individuals are willing to commute longer.

## V. Conclusion

Labour mobility is a direct part of the labour market and is directly linked to its supply. It is a term which "hides" a number of aspects whose clarification through knowing the functioning of the labour market can contribute to understanding the behaviour of individuals, resp. labour supply which is diverse. Findings and new contexts on labour mobility from the perspective of spatial commuting in Slovakia brings e.g. Michniak (2016), who states that the number of commuters is increasing, while his contribution uses secondary data and information from the Population and housing census as a result of a comparison between 2001 and 2011. Official statistics, which would investigate commuting from the perspective of time costs in relation to the socio-economic characteristics of employed individuals and other variables, are absent yet. In particular, the aim of the paper was to extend the knowledge of commuting to new aspects, such as commuting time, travel expenses and mode of transport. We found that respondents spend approximately 4 hours a week on commuting, while almost half of them use their own car (regardless of net monthly income). The monetary weekly travel costs of commuting are on average 12.5 €. We also found out that with increasing net monthly income of respondents, monetary costs and time costs of commuting are rising and there is a dependence between the time costs of commuting and the net monthly income of respondents.

Our conclusions also correspond to the findings in other countries where the commuting aspects are being pursued more intensively. Therefore, we note that our employed respondents do not differ significantly in behavior when commuting from labour market participants in other economies. Within OECD countries, Slovakia belongs among the countries with lower time costs of commuting. In our opinion, to assess whether a given fact is negative or positive is an irresponsible question. From the point of view of the subjective wellbeing of individuals, this may be a positive finding, but it is rather negative in terms of the flexibility of the labour supply. However, it is necessary to reflect on which factors, resp. determinants, could facilitate commuting and employment. Similarly, we consider it necessary to reflect the issue of supporting commuting in Slovakia, either from the private or public sector.

In 2018, the Employment Services Act No. 5/2004 Coll. has been amended. In order to promote labour mobility and reduce interregional disparities, this amendment made the conditions for entitlement to a job attendance allowance and a work mobility allowance are becoming more attractive (the maximum monthly amount of these allowances increases). The allowance shall be granted monthly to cover part of the commuting costs for attendance from the place of residence or from the place of temporary residence of the employee to the place of work stated in the contract of employment and back. New workers who were previously unemployed are entitled to it. The disadvantage is the necessity to document travel costs. We believe that, also because of the administrative burdens, the use of these allowances is still relatively low in spite of their increase and thus the question arises as to their merits. We believe that quality infrastructure and a functioning public transport network, not only by road but also by rail, are a prerequisite for labour mobility. Compared to developed economies, Slovakia lags behind not only in quality but also in the length of transport infrastructure. We believe that road and rail

networks should be renewed and completed to allow effective cooperation between individual car and public passenger transport. Currently, this difficult task is being addressed by transport planners in the capital. We assume that various measures can increase the share of the use of public transport in commuting, which in densely populated areas can help to relieve traffic and make the environment sustainable.

At present, in some sectors of the economy there is a shortage of workforce, the costs of commuting could be borne in part or in full by employers or public sector (taken into account in the employee's tax return). In Slovakia, however, the transport allowance is one of the rare corporate benefits. However, many companies offer coaching from the surrounding area, which is also one way of promoting labor mobility.

We perceive positively the initiative "To work on a bike" and the efforts of some municipalities to build cycling routes. However, we believe that so far these are rather non-systemic measures in some cities (e.g. Banská Bystrica) and they do not lead to the desired effect. The results of the surveys show that this mode of transport is suitable not only in terms of environmental protection and relieve traffic congestion, but also in terms of employee's subjective wellbeing. Therefore, the development of cycling routes should be part of transport plans in all municipalities in Slovakia. As a mode of transport to and from work, the bicycle should become part of the lives of the population, as is already the case in many European countries.

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