LABOUR MARKET IN SLOVAKIA 2019+

Miroslav Štefánik et al.

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CONTENT

PREFACE

This book represents another volume from a series of reports on the situation in the Slovak labour market, resulting from a research project funded by the Slovak Research and Development Agency[1]. The main goals of this report are as follows: (i) to review the recent labour market developments, (ii) to provide short-term and mid-term forecasts of the labour market developments, and (iii) to examine the causes of selected structural problems of the Slovak labour market. We are targeting the key stakeholders in the field of labour market policymaking, the research community, as well as the general public.

The first chapter provides an overview of the recent labour market developments in Slovakia, as well as stylised facts that attempt to place the existing trends in a broader macroeconomic picture and policymaking context.

In the second chapter, we present the results of a revised mid-term forecast of employment by economic sector based on a combination of macroeconomic and microsimulation models. Here we report the expected developments in terms of expansion and replacement demand for labour, pointing at the segments with the highest expected skills shortage.

The third chapter provides an overview of available evidence on the impact of Slovak active labour market policy measures. The main findings of available studies are placed in a broader labour market context and supplemented with information on the main historical developments of Slovak public employment services.

The fourth chapter provides evidence on the impact of one, recently introduced, publicly funded training measure available to registered jobseekers under the so-called REPAS programme.

In the fifth chapter, Slovak policies of labour market integration of persons with health disabilities are described and examined.

In the sixth chapter, labour market inequalities in Slovakia are analysed, applying the concept of social class. The class structure and its changes are exam-

[1] APVV-14-0324: Addressing social challenges related to the design of evidence based labour market policies

ined on the basis of EGP and ESeC class schemes. Social mobility is analysed through various log-linear models.

The final, seventh chapter, evaluates the accuracy of short-term predictions in respect of the unemployment rate produced during the concluding project funded by the Slovak Research and Development Agency (*APVV-14-0324: Addressing social challenges related to the design of evidence based labour market policies*).

Authors

1 SLOVAK LABOUR MARKET - SELECTED TRENDS

Ivana Studená

The aim of this introductory chapter is to provide an overview of general trends observed in the labour market in Slovakia. The selection of topics is based on relevance in understanding recent developments in social and employment conditions and in expectations for the near future. A brief review of statistical and analytical evidence is intended to set the scene for research evidence presented in the following chapters, which adopt different approaches in order to arrive at in-depth views on specific areas of the labour market in Slovakia.

Selected trends and indicators shall also support the reader in establishing linkages between individual chapters and issues covered and/or positioning individual research findings within a broader picture of overall development in Slovakia. References to policies and tools in place are made where possible and relevant so as to shed light on how policies are being developed, designed, implemented and supported and what is the connectedness between policymaking practice on the one hand and robust research evidence on processes determining labour market developments on the other hand.

1.1 Key aggregate trends

The EU is growing but the pace of growth is slowing down. Economies in the European Union have continued to grow since 2013, with annual improvements in GDP being around 2% on average. Such growth reflects also the improvements in household disposable income[2] (EC 2018a). More importantly, the positive trend is connected with improving social conditions in the EU. The percentage of individuals at risk of poverty or social exclusion decreased to 23.5% in 2016, which is close to minimum over the past 10 years[3]. Further performance with respect to social indicators will be receiving increased attention in connec-

[2] By the end of 2017, EU-28 GDP annual growth change +1.4 p.p. and GHDI +1.7 p.p.

[3] The percentage of individuals at risk of poverty decreased to 23.5% in 2016, while the lowest level in the past 10 years was 23.3% in 2009. (EU Statistics on Income and Living Conditions - EU-SILC), https://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions

tion with the adopted European Pillar of Social Rights in 2017 (EC 2017 a,b) and its monitoring process.

Despite the positive growth of EU economies, the slowing pace could be a concern. While 2017 exceeded expectations, Eurostat reported slowing in the growth rate in the first half of 2018, which can be connected with the trade tensions in the global markets and capacity limits including the lack of labour supply. The Slovak economy has been one of the stronger performers in GDP growth in the EU and also within V4 in past years. In 2017, Slovak GDP grew at 3.2% but other V4 countries reported growth above 4%. The first half of 2018 confirms overall slowing in the EU and across global economies but the growth rate in Slovakia picked up at above 4% (4.3% in 2Q of 2018).

EU labour markets have improved significantly. The Slovak labour market is improving in line with positive development in EU labour markets. The headline indicators — unemployment and employment rates — are improving across most EU member countries. Overall, the average unemployment rate in the EU was below 7% mid-2018, with a slightly lower rate for men. In most EU countries the unemployment rates fell close to the levels before the 2008 financial crisis. Consolidation to conditions prior to 2008 has been an important psychological benchmark to reach. Employment participation rates increased, reaching a 73.2% EU-28 average in the second quarter of 2018. The trend and forecasts suggest that the 2020 benchmark of a 75% average employment rate for the EU-28[4] could be reached. Nevertheless, differences among EU countries persist, and the unemployment rate remained above a two-digit level in two EU countries[5].

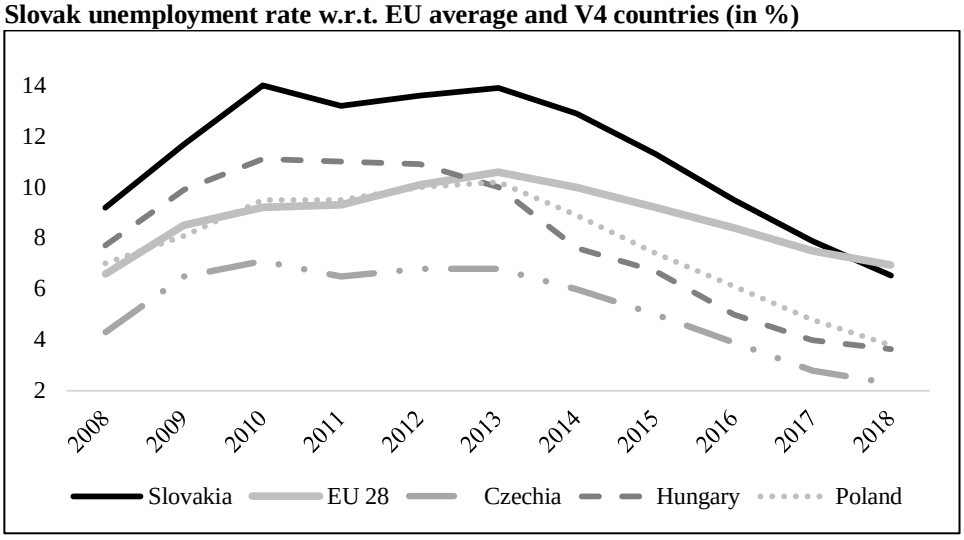
A number of EU countries have already reached or outperformed their national targets for 2020. One of the leaders in the employment rate indicator, the Czech Republic, reached their national employment rate target of 75% in 2016 and continued to improve, reaching 79.8%[6] in the second half of 2018, which was the highest among EU-28 countries. The job vacancy rate, indicating a lack of labour supply for available labour demand, had been rising since 2014 and in the beginning of 2018 reached 2.1% at the EU level, which is the maximum since 2006, i.e. prior to the last financial crisis. European labour markets started to increasingly feel consequences of a worsening demographic situation.

The Slovak labour market is following the EU trend, but risk areas remain. The Slovak labour market has been improving as well in overall perfor-

[4] Defined for age group 20 to 64 years old.
[5] Spain and Greece.
[6] Numbers in this section based on participation rates of 20 to 64 years old (Source: Eurostat).

mance and this is reflected in the key indicators[7]. The headline indicator, unemployment rate, dropped to historically low levels in 2017 (7.7%) and continued to decrease further in the first half of 2018 to 6.5%[8]. The decreasing trend in unemployment rates is observed also in other Visegrad countries so that the gap between the Slovak unemployment rate and the unemployment rates in Visegrad countries decreased only moderately (Figure 1.1). However, in the first half of 2018, the Slovak unemployment rate was slightly lower than the EU28 unemployment rate. The Slovak labour market reached such position for the first time since having joined EU. The improvement is to a large extent also due to negative demographic change, with continuing expansion labour demand.

Figure 1.1:
Slovak unemployment rate w.r.t. EU average and V4 countries (in %)



Source: Eurostat, [lfsa_urgan]

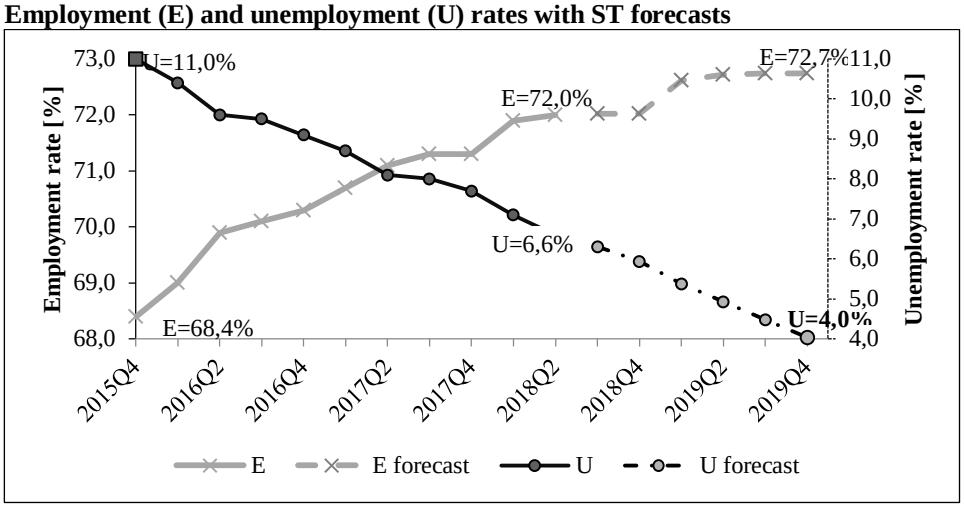
The employment rate increased to 71.1% in 2017 and 72% in the first half of 2018. Short-term forecasts expect a further unemployment decline (Figure 1.2) and decreasing pace of employment growth.

We observe an increasingly uneven gender pattern of employment participation growth, in favour of the male employment rate and thus creating a gender difference, with a male employment rate of 79% and a female rate of 64.8%. Short-term forecasts suggest continuing but decreasing overall growth in participation converging to participation rate below 73% by the end of 2019, with con-

[7] Improvements were expected also in line with forecasts, e.g. see previous editions of this series.
[8] Based on the Eurostat LFS quarterly figures, the unemployment rate in Slovakia reached 6.2% in the third quarter of 2018, the average of unemployment rates in the first 3 quarters of 2018 is 6.5%.

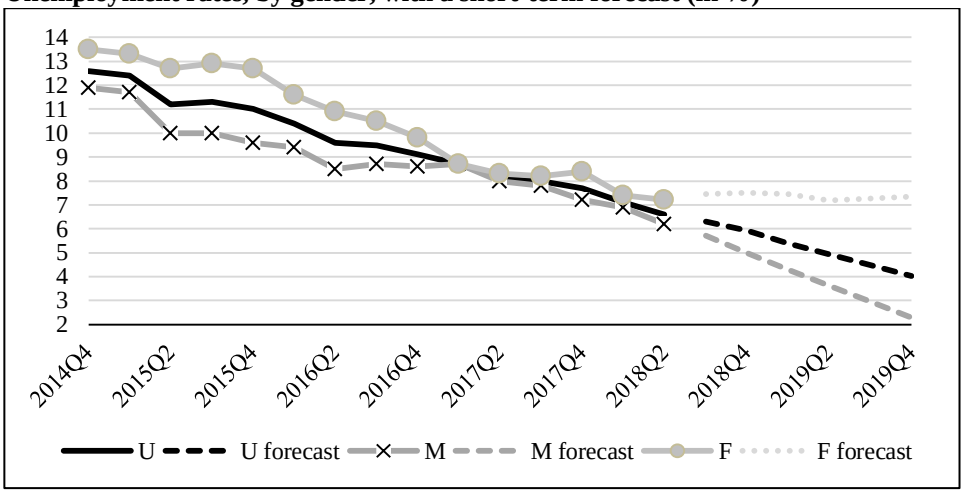
tinuing improving male employment rate and stagnating female employment rate[9].

Figure 1.2:
Employment (E) and unemployment (U) rates with ST forecasts



Source: Rublikova et al. (2018)

Figure 1.3:
Unemployment rates, by gender, with a short-term forecast (in %)



Source: Rublíková et al. (2018)
Note: U – Total unemployment rate; M/F – Male/Female unemployment rate

[9] All figures based on Rublikova et al. (2018), available at: http://www.prog.sav.sk/bulletin

There is a number of concerns as indicated by the gap in the performance of some indicators benchmarked against the EU average. While the employment rate national benchmark set at 72% has been achieved, further increases might be difficult unless an uptake of work migration will act as a more significant positive factor.

Overheating, vacancies, labour supply shortages in the EU and Slovakia. The negative demographic trend across EU countries (including Slovakia) and positive economic growth are the key reasons behind the labour shortages and high rates of vacancies. Tight real estate markets also contribute to labour market shortages in some countries, including Slovakia[10], and there is a concern that growing EU economies will overheat. With respect to the connectedness of other economies, the risk is relevant also for Germany and the Czech Republic out of the countries more connected and influencing the development of the Slovak economy. In terms of the increased number of vacancies for the Slovak labour market, the shortages of workers were expected, yet the experience is somewhat new after years of stagnating unemployment. Employers started to tap the pool of the long-term unemployed, who have been commented upon in preceding years as virtually impossible to recruit or retain in employment because of barriers and gaps that the long-term low-skilled unemployed had. Now, employers seem to find training solutions supporting workplace insertions.[11]

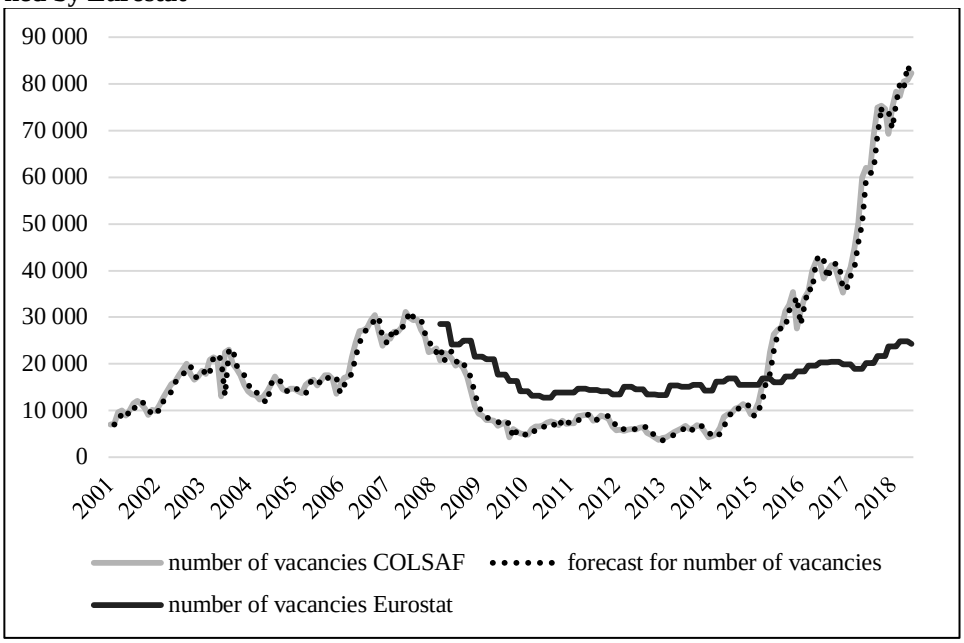
The short-term trend in the vacancy rate is forecasted to be positive (Figure 1.4) also in the future. In terms of the vacancy rate, the increase in Slovakia seems to be dramatic based on data from the Central Office of Labour, Social Affairs and Family[12] (COLSAF), but a methodological change was introduced by COLSAF in 2015. Based on a different methodology and sample (based on a representative sample of companies), Eurostat data also reveal growth but this is moderate compared to other V4 countries as can be seen in the Figure 1.4 Economic growth connected with FDI might be halted by not only insufficient labour supply but also increasing wages.

[10] V4 countries, except for Poland, have high real prices of real estate based on OECD housing indicators, with Hungary leading, followed by the Czech Republic and then Slovakia; based on https://data.oon ecd.org/price/housing-prices.htm

[11] More on measures introduced by MLSAF and the recruitment of foreign workers in 2018 is discussed in the section on migration in this chapter.

[12] The public employent service agency. https://www.upsvr.gov.sk

Figure 1.4:
The number of job vacancies registred by COLSAF and vacancy numbers published by Eurostat



Note: number of job vacancies, COLSAF and Eurostat are based on different methodologies
Source: COLSAF, Eurostat – Job Vacancy Statistics, [jvs_q_nace2]

1.2 Slovak labour market suffering from labour shortage

Further labour market developments in Slovakia will be increasingly sensitive and responsive to migration. A negative demographic trend, accumulated but persisting migration outflows, brain drain, and Slovaks working abroad in positions below their qualifications were characteristic of migration in Slovakia in past years and gradually contributed to labour supply shortages. Despite heated political debate in relation to the migration crisis in recent years, the interest of migrating refugees in remaining in Slovakia as a final destination country remained marginal.

Slovakia is one of the countries with the lowest share of foreigners with respect to the population. In 2017 there were around 100 thousand foreigners representing 1.92% of the total population of Slovakia. Since the accession of SR to

the EU in 2004, the number of legally living foreigners in Slovakia has increased more than five times[13] (OECD, 2018).

Migration outflows prevailing in Slovakia in the past decade. There is wide evidence that economically advanced countries attract tertiary graduates, and less developed countries tend to lose their highly educated workers (e.g. Zhang, Lucey, 2017). In the context of migration, Slovakia had attributes of a less developed country within the EU, with one of the highest percentages of migration outflows in the past. Among the target countries, Austria is leading, followed by the Czech Republic, which is a major target not only for work but also for tertiary education, channelling a share of the Slovak cohorts to the Czech labour market (often into high qualified work positions). Additionally, one tenth of university graduates in Slovakia leave after having studied in publicly funded education institutions in the years prior to 2015, with graduates of medicine being the most frequent to emigrate (Haluš et al. 2017)[14]. Migration decisions are being formed in situations with a high degree of uncertainty. Economic and employment prospects remain the most important in migration decisions, however, non-economic factors play an increasing role (Baláž, Williams, 2018). For Slovaks leaving their country, economic factors and employability prospects have been crucial in past years but the situation is changing.

Slovakia becoming a destination for work migrants. The labour supply shortages generated an increased demand for work migration to Slovakia. During 2017 and 2018 the lack of qualified workers became an urgent problem communicated by large employers. Employers' associations demanded immediate solutions to labour shortages in terms of employing foreigners and this pressure led to rather ad hoc policy measures supporting the recruitment of foreigners. The Law on Employment Services was revised at the beginning of 2018 and as of May 2018 new procedures were introduced to facilitate the employment of foreign workers (see Box 1.1)[15]. The measures facilitating the recruitment of foreign workers for particular professions support inflows of medium-skilled workers.

[13] From 22,108 migrants in 2004 to 104,451 in 2017.

[14] In their study based on national insurance data Haluš et al provided estimates of 5% of the population having left the country between 2000 and 2015, with more than half under 30 years old. Around half of these who left after 2000 returned by 2015.

[15] Further modifications facilitating the recruitment process were approved in November 2018 and will be valid as of January 2019, including further decrease of the time the job application must be processed to 30 days etc.

Box 1.1: Relaxing procedures of employing third country nationals

Since 2018, COLSAF (Central Office of Labour, Social Affairs and Family) is publishing occupations with labour supply shortage during the previous calendar year, in regions where the registered unemployment rate did not exceed 5%. For these occupations, foreign workers can be recruited under simplified procedures. A ceiling of 30% foreign workers at the firm level was put in place (OECD, 2018). For illustration, in 2018 only one NUTS3 region was not listed (Prešov region), and for the remainder, while the number of occupations listed per region varied, the most frequent occupations on the list were from the category of plant and machine operators and assemblers. In each region, medical professionals, especially doctors (generalists), are demanded as well. Further modifications facilitating the recruitment process of third -country nationals were approved by the government in November 2018 and will be valid as of January 2019. Employment of third-country nationals (non-EU nationals) is supported via Strategic Service Centres and the maximum time for processing work permits has been decreased significantly.
In 2017, Slovakia also introduced the EU Intracompany Transfer Permit with reference to the EU ICT Directive. This was an addition to an existing national scheme for ICT (OECD, 2018).

The number of foreign workers employed in Slovakia increased dramatically during 2017 and 2018, especially in the category of workers from third countries (see Chapter 2 – Figure 2.2). The most represented nationalities are the Ukrainian and Serbian. In the first ten months of 2018 the number of employed foreigners from third countries with a work permit increased by 41% (Table 1.1). As we can see, lower skilled migrants prevail, based on data on educational structure of inward migration which holds for migrants from EU and as well as from the third countries. The inflow of workers from third countries has been significant and will likely continue also in 2019 supported by policy measures facilitating the recruitment process as described above and in Box 1.1

The prevailing low skill profile of the migration inflow is a concern for the future growth prospects. The ICT initiative is an illustration that more support can be created for higher-skilled inflows. There has been limited acknowledgment of the need to look for solutions that would accommodate for the brain drain that took place in past decades. The attention to any measures supporting higher skilled migration remained low at policy level. In general, it still holds that Slovakia lacks long-term vision of strategic migration policy and this is becoming an increasing problem for the labour supply.

Table 1.1:
Migration inflows in 2017 and 2018 – employed migrants (number of persons)

	10/2018	12/2017	annual change	2018 share of workers with secondary education (or less)
EU nationals	33.741	27.726	18%	71%
Non-EU work permit	15.174	8937	41%	73%
Non-EU Info Card	16.344	12.815	22%	73%
Total	65.259	49.478	24%	

Source: COLSAF

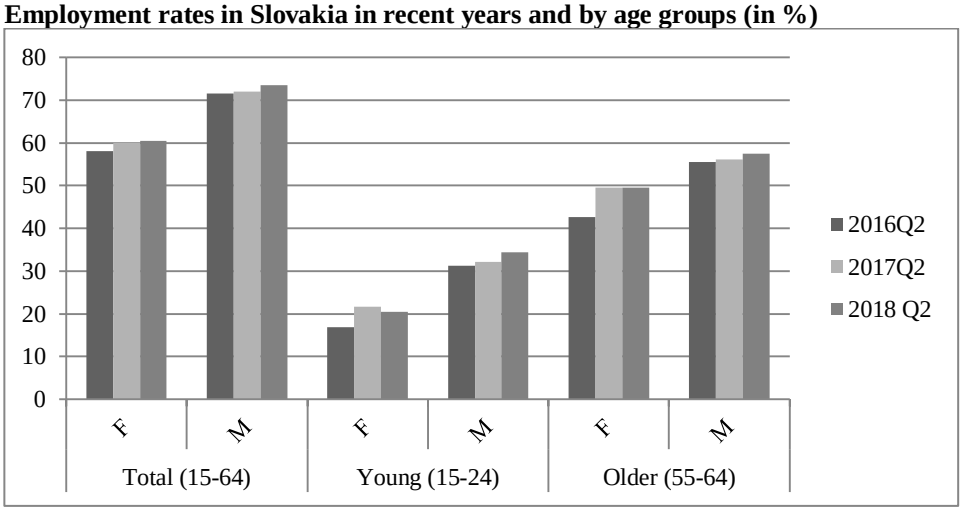
1.3 Update on the structural problems of the Slovak labour market

Developments in the structural pattern of the Slovak labour market. Structural imbalances have been traditionally the key issues in the Slovak labour market. This has not changed dramatically. The overall employment rates continue to slightly increase, and the employment rates increase also in individual age categories. However, the gap between age groups remains large, with only slightly more than every third young male under 25 years of age being employed and every fifth young female (Figure 1.5).

The gender structure of labour market participation is a concern with lower female participation rate, especially in the case of young females. Their employment participation rate has slightly decreased on an annual change basis. The difference between the young and the older female participation rates has further increased in the course of 2018. From the indicators at the European Social Scoreboard (EC 2018b), one of the most critical areas in Slovakia is the low share of children less than 3 years old in the formal childcare. This points to one of likely situational barriers that contribute to the gender employment gap.

Slovak population is aging at high pace and while the labour market may still benefit from higher skilled older workers for some years, the situation keeps worsening and the low skilled younger cohorts will be even less able to offset the replacement demand.

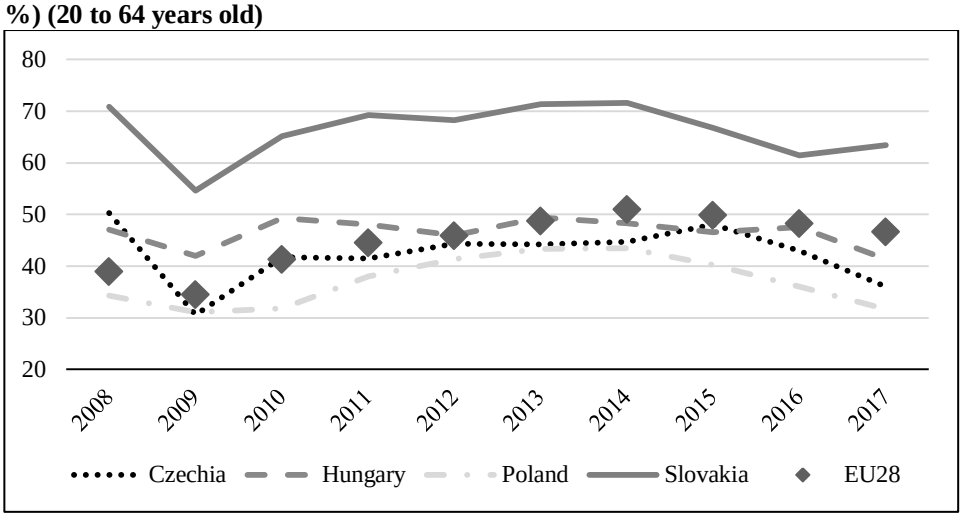
Figure 1.5:
Employment rates in Slovakia in recent years and by age groups (in %)



Source: Eurostat, [lfsq_ergan]

Long term unemployed and low skilled still a major concern. Long term unemployment has been systematically one of the most problematic areas of the Slovak labour market. Improvement has been achieved in decreasing the long term unemployment rate to 4.9% in 2017 from 6.3% in 2016 (for 20 to 64 years old). However, the share of long term unemployment on total unemployment remains one of the highest in EU and in the region (Figure 1.6).

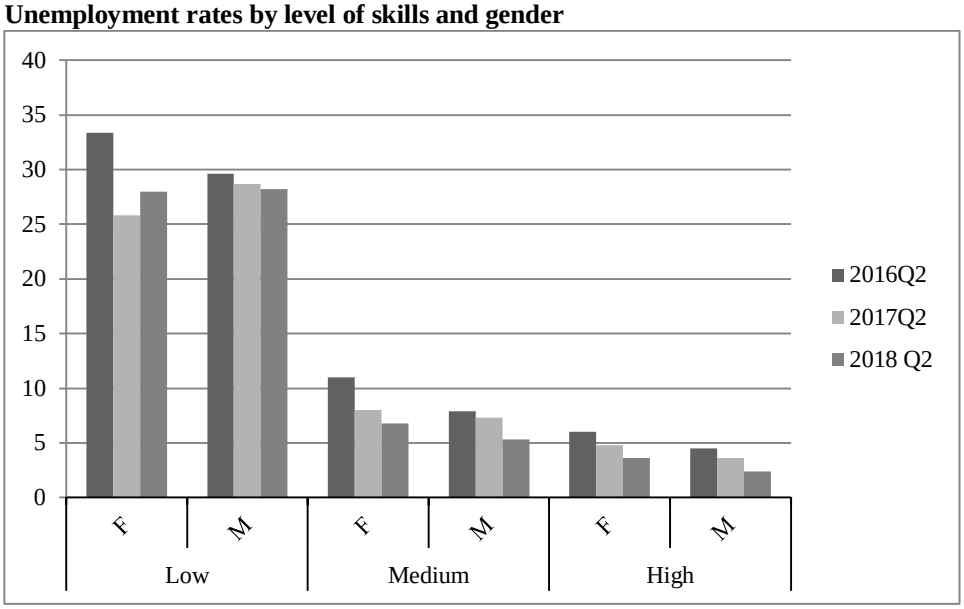
Figure 1.6:
Share of long term unemployment (12 months or more) on total unemployment (in %) (20 to 64 years old)



Source: Eurostat, [lfsa_upgan]

Low skilled are the most vulnerable at the labour market. The other key problem of the labour market structure is the situation of low skilled unemployed. Unemployment rates are the highest for the low skilled (Figure 1.7**)** and the temporal development for low skilled is either moderately positive compared to higher skilled or recently even negative in the case of low skilled females.

Figure 1.7:
Unemployment rates by level of skills and gender



Source: Eurostat, [lfsq_urgaed]

In the context of EU labour markets, Slovakia has been consistently ranking the last in terms of the labour market position of low skilled. Yet, despite all improvements in the past year, Slovakia keeps performing the worst in unemployment rate of low skilled compared to other EU28 countries (see Figure 1.8 in the Appendix). Accumulation of social disadvantages are characteristic for vulnerable position of low skilled at the Slovak labour market. Social inequalities and unequal chances represent a particular concern in terms of the labour market. The impact of social background on initial educational outcomes and on skills levels is one of the largest in Slovakia among EU and OECD countries in recent years. This indicates that new generations will be increasingly confronted with unequal positions at the labour market.

Despite Slovakia being still the best performer in low income inequality, the labour market realities and unequal chances show that the income inequality indicator needs to be interpreted with care. Especially in terms of labour market

chances, it might be more relevant to consider social inequality in the context of social classes and this is the focus of the sixth chapter of this book.

Upskilling and participation in lifelong learning (LLL) remains low. Critical situation of low skilled at the labour market calls for policy actions targeting the low skilled. While formally such priorities are formulated at policy level, less is happening in practice. In terms of policy response, Upskilling Pathways (further UP) is one of the key policy initiatives of the EC suggested to address the situation of lowly skilled in the labour market. Some active labour market policies (ALMPs) have been accounted for as being part of Upskilling Pathways (further UP), however, the implementation of the UP has not started yet in Slovakia, similar to other EU countries[16].

The ALMPs included under UP have been REPAS and REPAS+, two programmes providing funding to job seekers so that they can participate in vocational trainings provided by external providers. The programmes are supposed to allow for upskilling or reskilling of low skilled. The experience with these programmes revealed lack of job seekers capacity to identify viable learning and career tracks. As a response to that programme RESTART was developed, providing counselling and basic career guidance in a limited scope but being an important support to identification of learning needs. Review of ALMPs can be found in Chapter 3, and for an in-depth analysis of effectiveness of the individual ALMP REPAS, aiming at upskilling of low skilled please refer to Chapter 4 of this book.

ALMPs present the appropriate measures for training and skills development but remain under-developed and have limited outreach to vulnerable groups. ALMPs should be more developed together with other public programmes so that not only top down but also bottom up solutions could develop. Involvement of all relevant stakeholders at local and regional level capacity has proved as efficient in recent example of initiative developed by municipality of Zvolen in cooperation with a NGOs and other local actors (Vantuch, Jelínková 2018).

1.4 Conclusions

Labour market in Slovakia develops positively in line with improvements across other European labour markets. Employment rate target of 72% has been practically achieved in first half of 2018 having been set bellow the EU target of 75%. Further increases in employment rate in Slovakia are needed for further

[16] National qualification frameworks (NQF) are supposed to support the upskilling process, and in Slovakia the actual implementation of NQF via a system of qualifications assessment entitled the SUK (Systém overovania kvalifikácií) shall be launched during the course of 2019.

economic growth, however, the labour supply has hit its limits. Negative trends in labour market activity and skills development of younger generations are a concern. Labour supply shortages already present an acute risk factor for further economic growth.

Unemployment rate has decreased to historically low levels. Long term unemployment has decreased as well, but remains high when compared to other EU countries. Structural problems of the labour market persist and low-skilled and long-term unemployed are in specifically difficult positions. Slovakia remains the worst performing EU country in terms of the unemployment rate of the low-skilled.

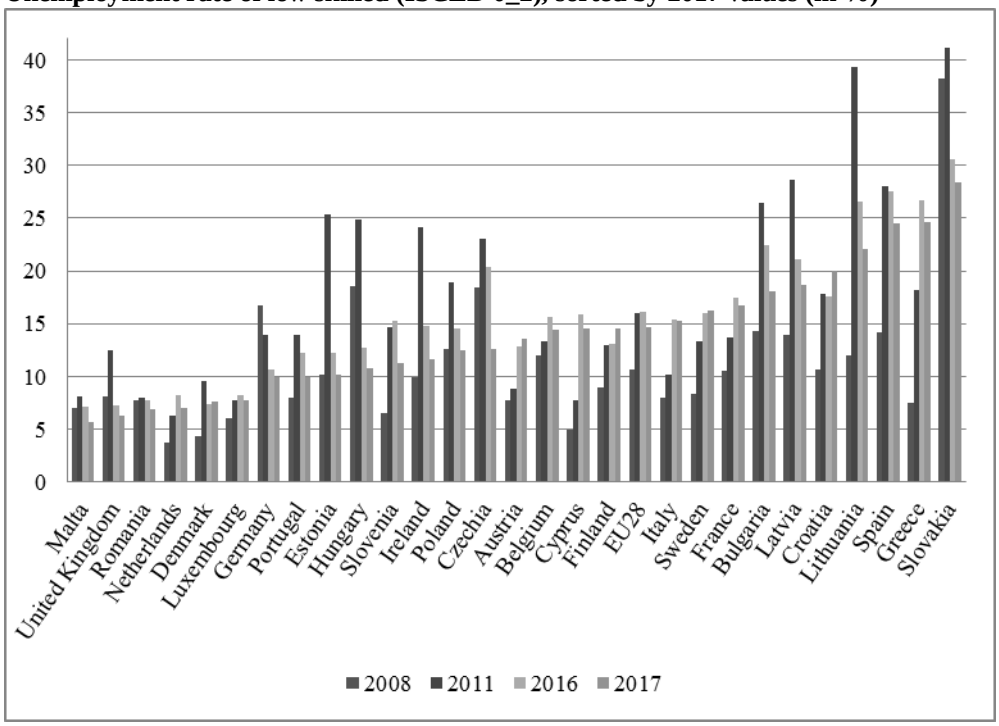
While in the past decades, Slovakia has been almost exclusively a country of migration outflows for work and study: recent developments are signalling a changing situation in terms of migration patterns. The trend in increased work migration inflows is positive, but a more systematic approach to strategic migration and a long-term vision need to be developed. However, this policy area has been absent in the past years. Short-term "quick-fix" solutions have been put in place to support the access of large employers to foreign workers. Nevertheless, a more strategic approach would be beneficial.

In terms of upskilling measures supported by public funding, this was implemented in a limited scope in the framework of ALMPs. Their upskilling impact is rather limited as there is practically no outreach to vulnerable groups, often suffering from cumulative social disadvantages and failing to register as jobseekers.

Together with more strategic migration solutions, upskilling and increased lifelong learning participation present a way of dealing with labour supply shortages, which will become even more urgent under the increasing demographic pressure. The need to increase participation in adult learning is evident not only in connection to improving employability of the low-skilled, but also anticipating changing skills needs for employed in the view of automatization.

1.5 Appendix

Figure 1.8:
Unemployment rate of low skilled (ISCED 0_2), sorted by 2017 values (in %)



Source: Eurostat, [lfsa_urgaed]

Table 1.2:
Rate of participation in lifelong learning activities, at least one activity in the past 4 weeks (LFS), at least one learning activity in the past year (AES), by educational levels (%)

	TOTAL	ISCED 0-2	ISCED 3-4	ISCED 5-8
at least 1 learning activity in last 4 weeks EU28	10.9	4.3	8.9	18.6
at least 1 learning activity in last 4 weeks SK	3.4	:	2.6	6.7
at least 1 learning activity in last 12 months EU28	45.1	24.0	41.3	65.7
at least 1 learning activity in last 12 months SK	46.1	:	43.4	61.7

Source: Eurostat, AES - Adult education survey [trng_aes_102], LFS Labour Force Survey [trng_lfs_02]

2 FROM HIGH UNEMPLOYMENT TO DEPENDENCY ON FOREIGN WORKERS – MID-TERM PREDICTION OF SKILLS SHORTAGE IN THE SLOVAK LABOUR MARKET

Ivan Lichner, Tomáš Miklošovič, Marek Radvanský, Miroslav Štefánik

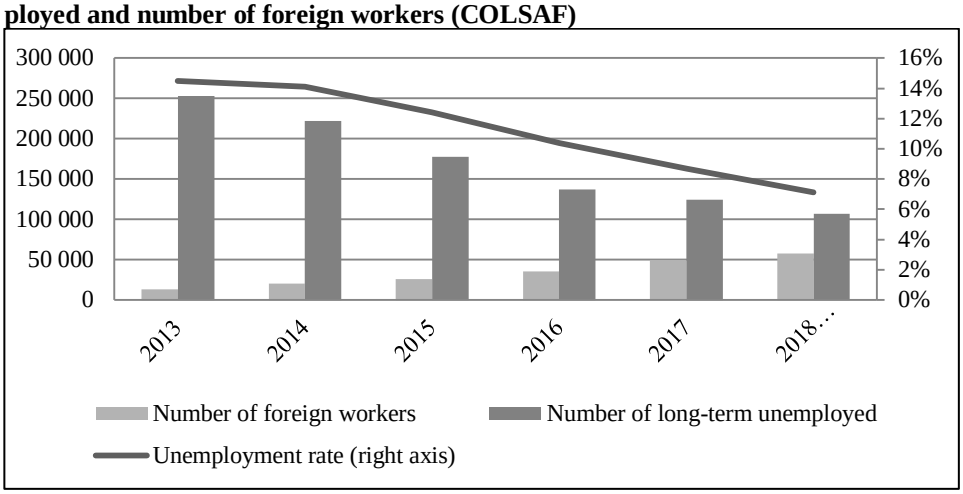
Recent development in the Slovak labour market has presented an unprecedented situation dominated by several interconnected factors, mainly a sharp decline in the unemployment rate, including long-term unemployment, followed by an increase in the share of foreign-born workers. Reaching values slightly above 100 thousand persons, during 2018, long-term unemployment[17] achieved the historically lowest level since the beginning of 1994. Since 2013, the number of foreign workers in the Slovak labour market had more than quadrupled, reaching almost 60 thousand by mid-2018[18]. This development clearly demonstrates that "the question of structural unemployment and skills shortage again became urgent" (Lichner et al. 2016). Recent development has shown that the ability to fill in vacancies with Slovak workers is decreasing. While in 2015, only 10% of new jobs were filled by foreign workers, in the first half of 2018 the percentage of foreign workers in total placements was 54%. At this point, it is important to stress that foreign workers are mainly concentrated in occupations that were stable, or even decreasing in the past.

The majority of foreign workers in the Slovak labour market came from the EU member states. By the end of June 2018, the highest share of them were from Romania (almost 10 thousand persons), followed by Hungary (5.4 thousand) and the Czech Republic (5.2 thousand). The biggest suppliers of third-country nationals working in Slovakia are Serbia (13.7 thousand) and Ukraine (7.2 thousand). An especially dynamic development occurred in the case of Serbians. At the end of 2015, only 1,700 Serbians worked in Slovakia. Over the past three-and-a-half years, an additional influx of almost 38 thousand foreign workers was registered. Workers from Serbia and Ukraine covered more than 50% of it. This increase occurred despite the relatively complicated and time-consuming administrative process of obtaining work permits in Slovakia. This development was relatively recently reflected in changes cutting the red tape of legislation covering the process of the acquisition of work permits. This decision motivated the fact that the stock of the relatively employable unemployed and the stock of

[17] Measured by LFS methodology.
[18] Despite the recent increase in the share of foreign workers, Slovakia is still lagging behind its neighbouring countries (Poland, the Czech Republic and Hungary).

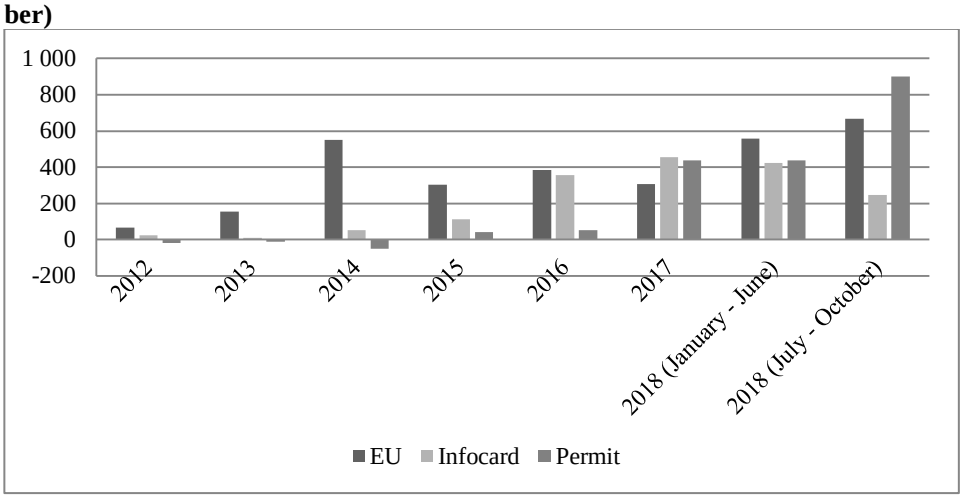
third-country nationals fulfilling the conditions for employment without a work permit, the so-called Infocard, were already heavily exploited in previous years and the first half of 2018. This fact is also reflected in the development of the average monthly number of new jobs covered by the Infocard procedure that drop between June and October from more than 400 to a level of around 250 jobs per month. During the same period the number of issued work permits more than doubled.

Figure 2.1
Development LFS unemployment rate (right axis), number of long-term unemployed and number of foreign workers (COLSAF)



Source: Slovak Statistical Office, Central Office of Labour, Social Affairs and Family (COLSAF)

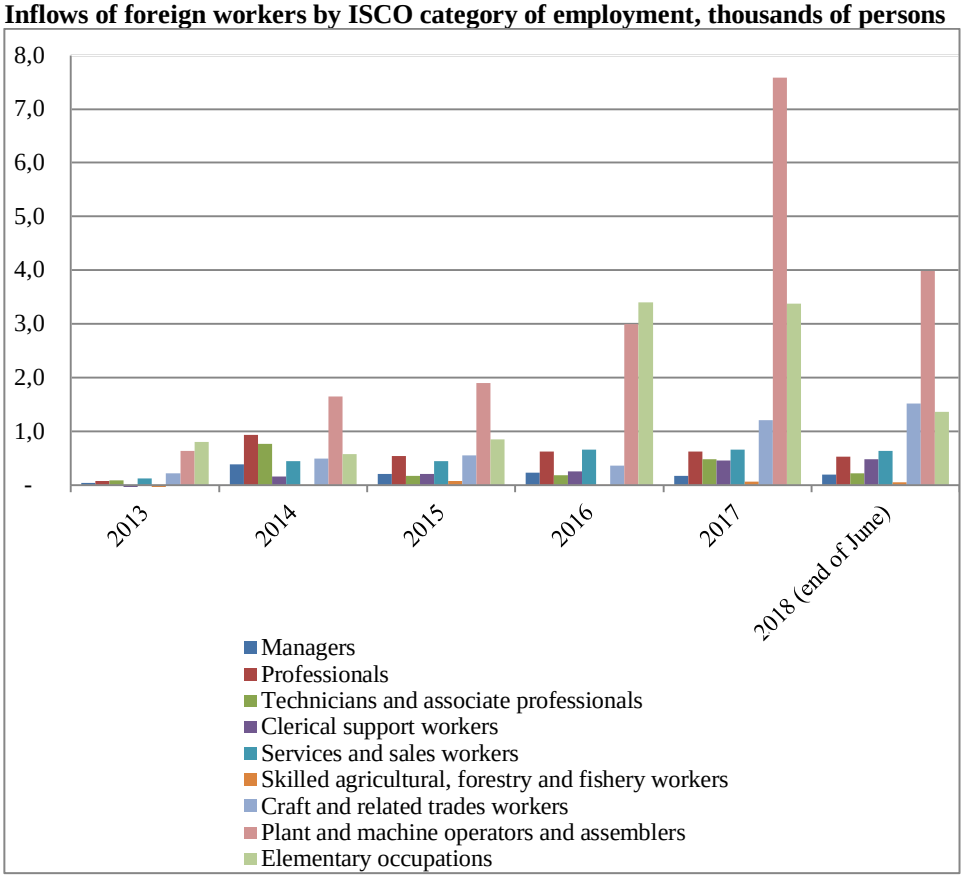
Figure 2.2:
Average monthly inflow of foreign workers by category, 2012–2018 (end of October)



Source: COLSAF

From the perspective of the qualification structure over the past three years, during which an increased share of third-country nationals have been employed in Slovakia, those workers find their jobs mainly in the low-skilled part of the labour market. The change in the number of foreign workers in elementary occupations (ISCO 9) increased (+3.4 thousand)| during 2017 more than the level of total employment (+2.5 thousand), which indicates that in those occupations, foreign workers are already covering part of the replacement demand. In the plant and machine operators and assemblers group (ISCO 8) the situation in 2017 was relatively similar, wherein employment of foreign workers increased by 7.6 thousand and total employment grew by 7.5 thousand jobs. Those recent developments were in the first half of 2018 even more profound, while overall employment in those two occupational groups even decreased and the number of foreign workers continued to increase. Thus, it needs to be added at a slightly slower pace than before.

Figure 2.3:
Inflows of foreign workers by ISCO category of employment, thousands of persons



Source: COLSAF

In the following parts of the chapter we first describe the methodology and later the results of our predictions of the skills shortage in Slovakia. Focus of the analysis is given to the future expected shortages in the Slovak labour market in terms of educational levels and fields. An increase in the number of foreign workers at certain occupational levels represents a relatively reliable proxy of current shortages. Our results partially explain the recent development related to the structure of jobs filled by foreign workers.

2.1 Methodology

The results presented in the following parts of this chapter are based on the unique combination of a set of macroeconomic models. In the first place, overall development of the Slovak economy, together with GDP growth, was forecasted by the latest version of the econometric error correction (ECM)-based model (Radvanský and Lichner 2018). In the next stage, a computable general equilibrium (CGE) model (based on Miklošovič 2014) utilising the results of macro indicators projected by the ECM model translates the national-level development to the sectoral level (NACE Rev. 2). Results on the sectoral level were aggregated to the following 10 groups:

Table 2.1:
Sectoral aggregation

Sector	NACE Rev. 2
Agriculture, Forestry and Fishery	A
Mining and Quarrying	B
Manufacturing	C
Energy	D, E
Construction	F
Trade and Food	G, H, I
ICT, Financial and Real Estate	J, K, L
Professional and Other Services	M, N
Non-Market Services	O, P, Q
Other Services	R, S, T, U

Source: Authors

The CGE model within the sectoral structure also estimates the labour demand by qualification defined by ISCO 08. A more detailed description of the connections and methodological issues related to the combination of ECM and CGE models could be found in Radvanský et al. (2015) and Lichner et al. (2016). This set of models provides projections of the demand side of the Slovak labour market.

The supply side of the labour market was modelled using microsimulation model VZAM_mikrosim_2.0, which was created at the Institute of Economic Research of the Slovak Academy of Sciences (IER SAS) and is, in fair detail, described in Štefánik and Miklošovič (2016). The current version of the model is based on the Labour Force Survey microdata for Slovakia in 2017. The initial population is in the following periods updated using a set of deterministic and probability functions covering the following processes: ageing, fertility, mortality, migration, educational achievement, status, economic activity, employment, and unemployment.

Ageing – this process adds a year to the age of all persons in the population;

Fertility – is a random process based on age-specific fertility tables;

Mortality – is a random process based on the age- and gender-specific mortality tables;

Migration – net migration is modelled within this process, where new migrants represent clones of migrants already in the population;

Education – at the age of 16, the decision regarding the level and field of education is modelled. Decision probabilities are based on the educational structure of a cohort of 30–34 years of age from 2017. The secondary level of education is achieved at the age of 19 years and the tertiary level of education at the age of 25 years; thereafter, no changes in acquired education are allowed;

Status – this process decides whether each person is active, inactive or disabled. A logit score is applied in order to sort individuals to be allocated to one of the statuses on the basis of age- and gender-specific inactivity and disability tables based on LFS 2017 data. After reaching the retirement age, all persons' status changes to retired; from the group of retired on the basis of the logit score applied to the age- and gender-specific probability of working tables, potentially employable retirees are selected;

Economic activity – the economically active are all persons aged between 16 years and the retirement age who are not inactive, disabled or in education, plus potentially employable retirees;

Employment – this process bridges the information from macroeconomic models on labour demand with the available labour supply. Economically active persons working in certain positions in the previous year remain in their positions. If the total demand (expansion and replacement) for labour in the sector is shrinking, persons with the lowest sector-specific logit score are assigned as unemployed. These individuals are further used in the matching process as vacancies in other sectors are being filled. Matching takes into account the acquired education of individuals and the educational structure of the employed in the sector. If there are some vacant positions after the pool of the unemployed has been utilised, migrants are cloned until the demand for labour is met;

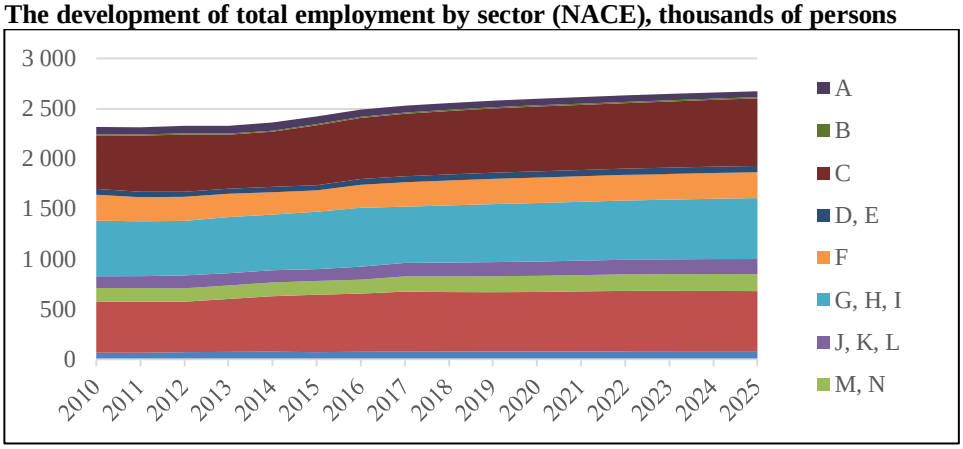
Unemployment – in this process all active persons without a job are marked as unemployed.

All processes run in each time period (one year). Resulting from the described chain of processes is a simulation of supply- and demand-side matching in the Slovak labour market.

2.2 Results

In this part, results of the mid-term projection are presented. Underlying assumptions related to the future development are based on the updated macroeconomic forecast of the Institute of Economic Research (Radvanský & Lichner, 2018) for the years 2018–2021. After the horizon of a detailed macro forecast, continuation of relatively positive global economic development is assumed with a slight decrease in its overall growth rate.

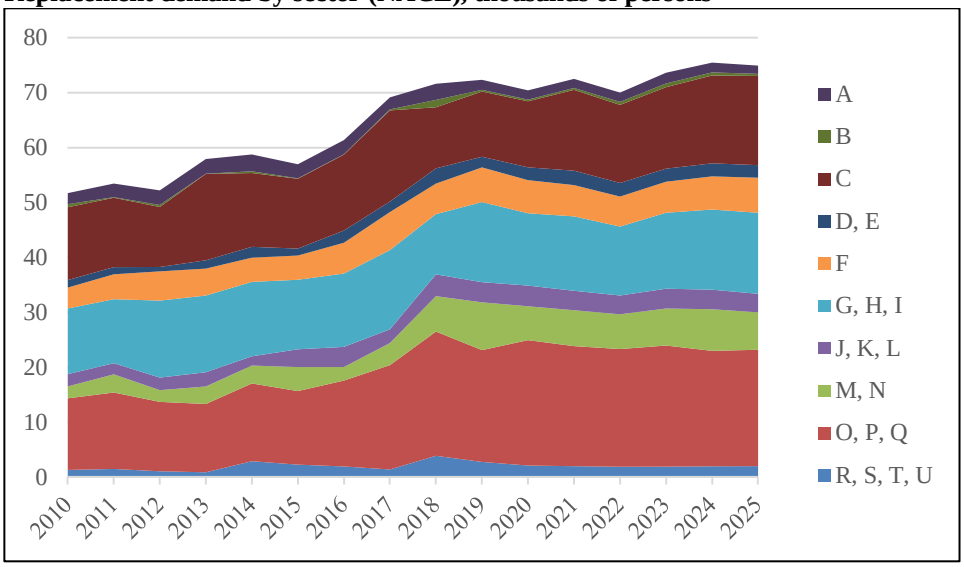
Figure 2.4:
The development of total employment by sector (NACE), thousands of persons



Source: Authors, Slovak Statistical Office (Labour Force Survey)

Results of the mid-term projection expect that the total employment in Slovakia will reach almost 2.7 million persons in 2025. During the next three years an additional 69 thousand jobs should be created in Slovakia. From a sectoral structure point of view, future development up to 2025 should be relatively stable, with the largest increase (+0.59 p.p.) in the share on total employment in Manufacturing and Trade, and the largest decrease in the case of the Non-Market Services sector (-1.3 p.p.). Over the coming years, year-by-year expansion demand would be decreasing from its expected top level in 2018 (26 thousand) to around 13 thousand in 2024 and 2025.

Figure 2.5:
Replacement demand by sector (NACE), thousands of persons

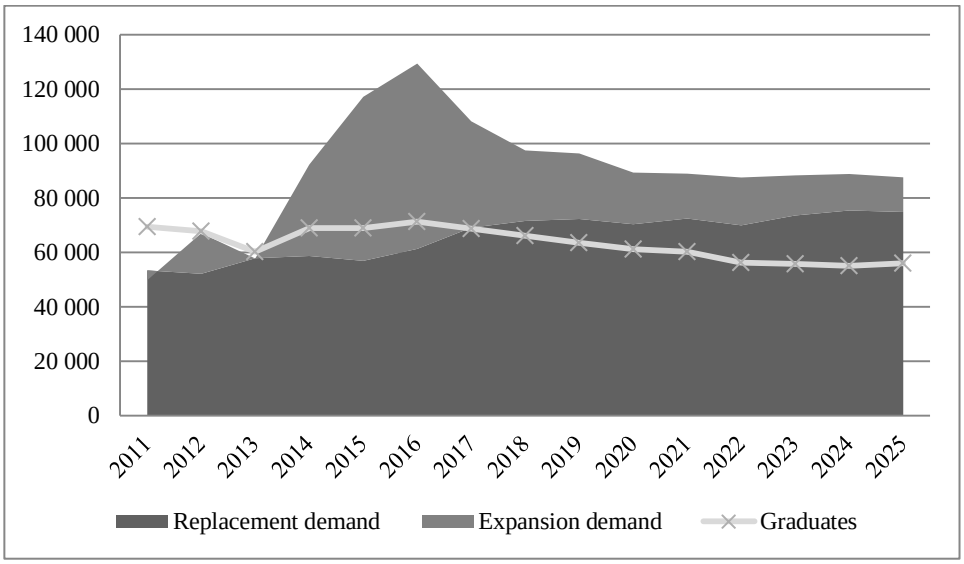


Source: Authors, Slovak Statistical Office (Labour Force Survey)

On the other hand, ageing of the Slovak population presses up the number of workers leaving the labour market. Because of this, the replacement demand is expected to increase slightly throughout the predicted period. Between 2010 and 2017, annual replacement demand for labour increased from around 51 thousand to more than 69 thousand. In the years to come, projection indicates a further increase in the total amount of replacement demand that would reach annual levels of around 75 thousand. The majority of the increase since 2010 has occurred in the sectors of Manufacturing, Trade, and Non-Market Services. A further increase is expected in the case of Non-Market Services, and other sectors will, on average, remain at a relatively stable level of replacement demand, or will increase only slightly. A comparison of expansion demand and replacement

demand development with the number of graduates entering the labour market provides valuable information about the overall balance in the labour market.

Figure 2.6:
Comparison of supply (graduates) and demand (expansion and replacement) in the Slovak labour market



Source: Authors, Slovak Statistical Office (Labour Force Survey)

It is clear that until 2013 the number of graduates entering the labour market[19] was sufficient to cover both expansion and replacement demand. Positive overall economic development translated into the fact that up to 2017 the number of graduates was sufficient only to cover the replacement demand and part of the expansion demand. Model projection indicates that the combination of demographic trends, the increasing number of retirees and the lower number of young cohorts will result in a situation wherein the number of graduates will not be sufficient to cover at least the replacement demand. This situation will pose new challenges to the policymakers and employers in Slovakia in finding a solution that will minimise the plausible negative effects of labour shortages on the overall economic growth of the country. Model results provide us with the possibility to have a more detailed look at the structure of future imbalances.

[19] Measured as a change between the statuses of a person who was a student during one period beforehand and currently is either employed or unemployed.

2.2.1 Identification of skills shortage

The following paragraphs of analysis are focusing on the identification of labour market skills shortage[20], comparing the total expansion demand, replacement demand, and the number of graduates structured by the level (secondary and tertiary) and field of education (following ISCED-F 2013 definitions)[21]. To measure the gap between future needs and labour force disposability, an indicator of the skills shortage was proposed and calculated. The proposed indicator of skills shortage $IN_{i,j,t}$ is defined by the following relation:

$$IN_{i,j,t} = \frac{Grad_{i,j,t}}{(Emp_{i,j,t} - Emp_{i,j,t-1}) + RD_{i,j,t}}$$

where $Grad_{i,j,t}$ represents the number of graduates of the i-th level of education and the j-th field of education in year t, $Emp_{i,j,t}$ is the level of employment by level and field of education, and $ED_{i,j,t}$ stands for replacement demand in a given level and field of education in the respective year.

On the supply side, the indicator covers only the inflow of new graduates in the labour market as an indicator of additional labour supply. In this approach it is implicitly assumed that the stock of the unemployed is not influencing the structure of the available workforce in the long term. Additionally, we abstract from inflowing migration, as this is assumed to be filling the existing shortages. The proposed indicators of skills shortage by level and field of education thus provide information about the expected change in the balance between labour market demand and additional supply. If the number of graduates is higher than the expansion and replacement demand for the qualification acquired in the given level and field of education, then the surplus of such graduates enter the market. Shortage in the given level and field of education occurs in the adverse situation. In other words, if the value of the indicator is lower than 1, then there is an indication of a shortage.

Model results indicate that over the coming five-year period, the number of graduates entering the labour market will not be sufficient to cover the total labour demand for any combination of level and field of education. Surprisingly, least problematic seem to be Engineering, Manufacturing and Construction

[20] For a distinction between skills shortage and skills mismatch see the definition adopted in OECD (2017).

[21] Due to only marginal numbers, low reliability of available information from LFS, Field 00 Generic programmes, and qualifications was omitted from further analysis.

fields of education at the tertiary level, which seem to be contrary to claims of employers that technical fields are of the highest demand. On the other hand, the lack of technical fields was confirmed by the result for the secondary level of education. The indicator suggests that on the secondary level the most problematic fields are: Education, Natural Sciences, Mathematics and Statistics, and Arts and Humanities, together with Social Sciences, Journalism and Information. At the tertiary level the most problematic seem to be Education, Arts and Humanities, Social Sciences, Journalism and Information, together with Natural Sciences, Mathematics and Statistics.

Table 2.2:
Indicator of skills shortage[22], by level and field of education

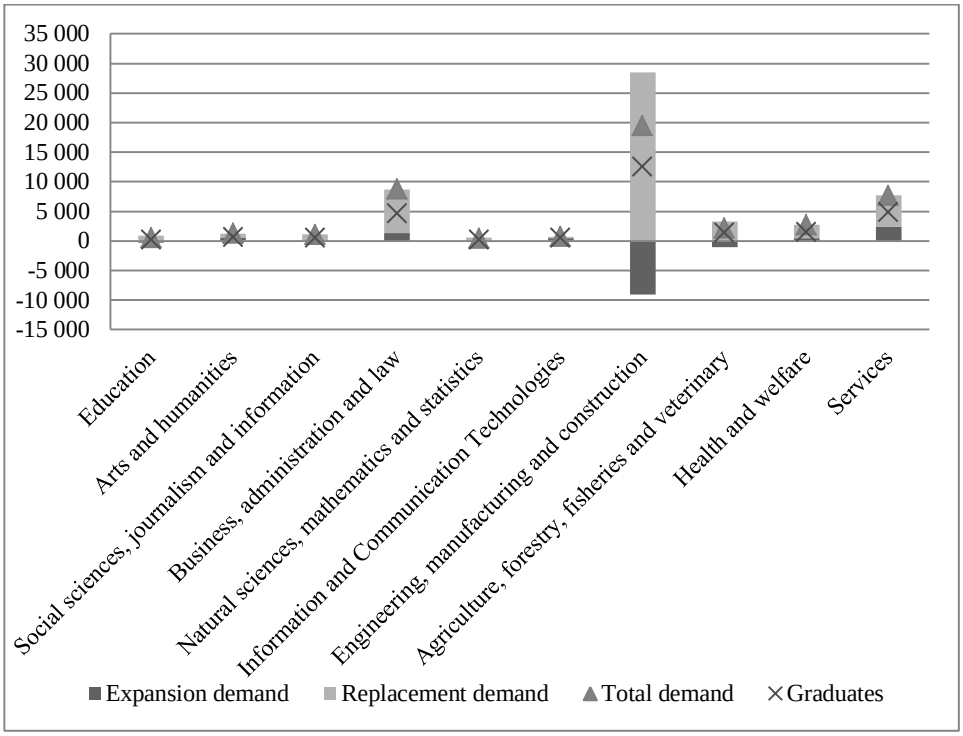
Level/field of education	Education	Arts and Humanities	Social Sciences, Journalism and Information	Business, Administration and Law	Natural Sciences, Mathematics and Statistics	Information and Communication Technologies	Engineering, Manufacturing and Construction	Agriculture, Forestry, Fisheries and Veterinary	Health and Welfare	Services
Secondary	0.39	0.48	0.48	0.54	0.41	0.74	0.65	0.64	0.53	0.63
Tertiary	0.65	0.65	0.67	0.80	0.67	0.89	0.94	0.82	0.72	0.92

Source: Authors

To confirm the results suggested by the values of the indicator, it is important to examine not only the relative values but also the absolute volumes of the shortages. This perspective provides a slightly different picture when disaggregated by the level and field of education.

[22] Values calculated on the basis of 2018–2022 annual average levels of expansion and replacement demand, and graduates.

Figure 2.7:
Average annual demand and supply of secondary education level labour force, 2018–2022, by field of education

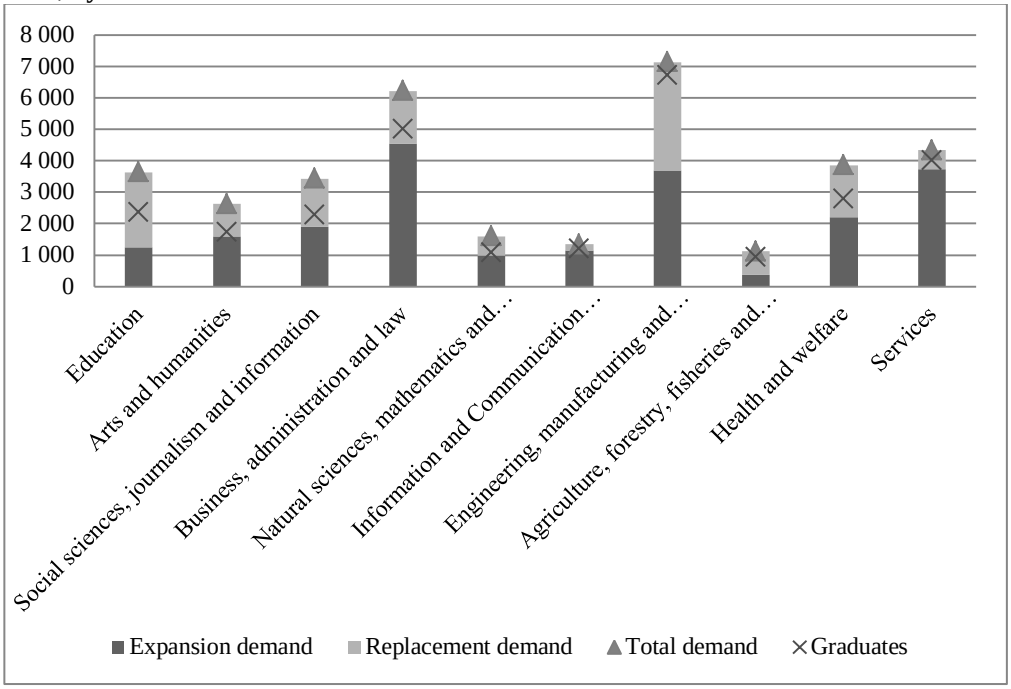


Source: Authors

On the secondary level of education, the most severe problems should be foreseen in the fields of Engineering, Manufacturing and Construction, Business, Administration and Law, and Services, in which on an annual basis a shortage of almost seven thousand, more than four thousand and 2.8 thousand will be generated. These figures present the absolute difference between the total demand and the total number of expected graduates.

Furthermore, on the tertiary education level, shortages will be generated but their magnitude will not be as severe as in the case of the secondary education level. The largest annual average shortage is expected to occur in Education and Business, Administration and Law (1.2 thousand), followed by 1.1 thousand in Social Sciences, Journalism and Information. Around one thousand persons will be, on average, missing in the fields of Health and Welfare and Arts and Humanities. Exact figures on the predicted average annual number of demanded persons can be found in the Appendix.

Figure 2.8:
Average annual demand and supply of tertiary education level labour force, 2018–2022, by field of education



Source: Authors

2.3 Conclusions

After a long period of excessive labour supply, when Slovakia ranked among the countries with the highest unemployment rate in the EU, the situation is rapidly changing. Since 2016, the labour market in Slovakia has experienced a new situation in which total available domestic sources of labour are tightening and the unemployment rate has dropped to a historical minimum, mainly due to demographic development, wherein relatively large cohorts of active persons are leaving the labour market and significantly lower numbers of domestic graduates are entering the labour market. This negative development is even multiplied by the fact that a significant share (14.5%[23]) of tertiary education students are finishing their degrees abroad and only a proportion of them are returning to Slovakia afterwards. On top of this, according to Institute for Financial Policy (2017), one out of 10 tertiary education graduates after finishing studies in Slovakia move abroad.

[23] According to OECD (2017a), in 2015, 14.5 out of 100 tertiary students from Slovakia enrolled abroad.

The labour market reacted to this development with an increased inflow of foreign workers. According to the COLSAF data, by the end of October 2018 there were almost 83 thousand vacancies, while at the end of 2013, which was the last year when the number of graduates entering the labour market was higher than the expansion and replacement demand combined, there were only 5.4 thousand vacancies[24].

We use a combination of two macroeconomic models to predict the development of the demand side of the Slovak labour market (employment). This prediction is later combined with a microsimulation model of the supply side of the Slovak labour market. Using this combination of models allows us to quantify and predict the expansion and replacement demand for labour in Slovakia. Additionally, we provide an indicator of skills shortage broken down by level and field of education.

Results of the mid-term projection suggest that in the next five years, domestic sources will have significant difficulties in meeting the needs of labour market demands. There is no reason for expecting that the already experienced situation is going to change in the horizon of the following 10 years. Even if an economic downturn kept the expansion demand for labour minimal or even slightly negative, cohorts inflowing to the labour market would hardly cover the expected replacement demand.

Labour market policies need to be prepared to react to this development. Some reactions are already going on, but only short-term measures have been adopted thus far[25]. Our predictions show that skills shortages are going to remain an urgent problem in Slovakia for at least 10 more years and their intensity is more likely to even increase. This creates an urge for even more comprehensive and strategic approaches in addressing this problem.

At this point we see implications of our prediction in three policy areas. First is the provision of publicly funded education. There is a long-term, ongoing debate surrounding what are the needs of the labour market, how to measure and predict them and how the structure of graduates should adjust to the structure of existing demand for skills. This debate often slides towards central planning — educational quotas to be enforced because individuals (and their parents) are not making responsible decisions about their future. Strong lobbying of big employers, predominantly from the manufacturing sector, receives much visibility in the

[24] It is not clear how much of this increase is driven by a change in the information system that COLSAF is using to collect vacancies.
[25] For example, the most recent revision of the Employment Act on Employment Services relaxing the rules for employing third-country nationals.

public debate, voicing their specific skills needs. One of the best indicators of a skills shortage is the skills structure of the recent inflow of foreign labour, because this is the result of actual hiring decisions of employers. The evidence presented here shows that in the recent inflow of foreign labour, low-skilled occupations are overrepresented. Adjusting the existing structure of graduates to the existing skills needs should, therefore, result in the downskilling of cohorts inflowing to the labour market in subsequent years. Our results basically confirm this trend, showing that the most significant shortages are expected in the group of secondary-educated in the field of Engineering, Manufacturing and Construction. Skills shortages are less protrusive at the level of tertiary education. The question raised in this context concerns whether in the long term, downskilling is in the interest of individuals or the country, especially when Slovakia is not going to be able to extensively cover its future skills shortage with its own human resources — future inflow of graduates (see Figure 2.6).

The second policy area wherein we can see implications of our results is the activation of the long-term unemployed. Although the number of the long-term unemployed has dropped significantly during the past few years, in international comparison, the share of long-term unemployment remains relatively high[26]. Low-skilled jobseekers remain overrepresented among the registered jobseekers in Slovakia. Because it is predominantly low-skilled occupations in manufacturing which need to be filled, activation and retraining should not be too temporally or financially demanding. Activating this pool of individuals with intensified ALMP measures remains a challenge. A significant part of this challenge might be that of spatial mobility. Most of the newly created jobs and the highest demand for labour are situated in the western part of Slovakia, while most of the unemployed remain in its eastern parts. Supporting spatial mobility of jobseekers might be, therefore, linked with high yields[27].

The third policy area in which our results could be of some relevance is immigration policy. Our projections show that the recent change in the labour market is driven predominantly by demographic factors; therefore, we expect: i) the existing skills shortages to become even more pronounced in the following years; and ii) the lack of a workforce to become a long-term problem, relatively unrelated to the economic cycle. Because of this, Slovak policymakers should be motivated to put more effort into creating a comprehensive, long-term strategy on attracting the workforce from abroad, including not only the foreign-born but also the Slovak-born population living abroad.

[26] See, for example, Graph 1 in Chapter 3 of this book.
[27] See, for example, Štefánik and Karasová (2015).

2.4 Appendix

Table 2.3:
The development of total employment by sectors (NACE), thousands of persons

	A	B	C	D, E	F	G, H, I	J, K, L	M, N	O, P, Q	R, S, T, U	Total
2010	75.0	13.9	530.1	58.0	258.4	555.3	117.5	134.9	511.1	63.6	2317.8
2011	71.2	11.6	560.5	54.5	240.9	547.6	118.9	136.7	509.3	62.9	2314.2
2012	75.4	12.6	570.3	50.4	240.7	544.1	129.0	133.6	503.7	69.3	2329.1
2013	77.1	11.5	539.5	50.5	232.8	560.2	122.5	134.9	528.2	71.9	2329.0
2014	82.6	9.6	550.4	54.2	223.2	555.4	122.2	137.4	553.4	74.3	2362.6
2015	77.0	11.9	598.2	51.2	213.5	572.9	118.2	137.5	573.4	69.1	2422.9
2016	71.9	11.0	610.1	57.9	229.4	587.9	129.9	138.8	580.7	73.3	2491.0
2017	68.5	12.6	623.4	60.1	244.1	561.1	134.7	152.2	599.7	73.5	2530.1
2018	66.7	12.6	632.8	60.9	248.8	570.7	138.1	156.3	594.6	74.5	2556.0
2019	65.5	12.6	641.2	61.5	252.0	579.1	140.8	159.6	592.4	75.4	2580.1
2020	64.7	12.6	647.5	62.0	254.0	584.6	142.3	161.3	594.0	75.9	2599.0
2021	65.3	12.6	649.9	62.2	255.1	587.7	144.3	162.8	598.9	76.7	2615.5
2022	65.4	12.5	653.3	62.4	256.6	591.4	146.1	164.6	603.5	77.3	2633.1
2023	64.1	12.6	659.8	62.7	256.8	596.4	147.5	166.9	603.2	77.9	2647.8
2024	60.2	12.6	667.4	63.1	257.4	602.5	149.0	168.8	601.6	78.7	2661.3
2025	58.4	12.7	674.6	63.4	257.2	608.9	150.6	169.8	599.2	79.4	2674.0

Source: Authors, Slovak Statistical Office (Labour Force Survey)

Table 2.4:
Replacement demand by sectors (NACE), thousands of persons

	A	B	C	D, E	F	G, H, I	J, K, L	M, N	O, P, Q	R, S, T, U	Total
2010	2.0	0.6	13.3	1.4	3.8	12.0	2.2	2.2	13.0	1.3	51.7
2011	2.5	0.1	12.6	1.3	4.5	11.7	2.0	3.3	13.9	1.5	53.5
2012	2.7	0.4	10.9	0.8	5.3	14.0	2.3	2.1	12.6	1.1	52.2
2013	2.7	0.0	15.7	1.5	4.9	14.0	2.6	3.2	12.4	0.9	57.9
2014	3.1	0.3	13.4	2.0	4.4	13.5	1.7	3.3	14.2	2.9	58.8
2015	2.6	0.1	12.7	1.3	4.4	12.7	3.2	4.4	13.4	2.3	57.0
2016	2.6	0.1	13.8	2.2	5.6	13.4	3.7	2.5	15.6	2.0	61.4
2017	2.2	0.2	16.6	1.9	6.9	14.4	2.5	4.0	19.0	1.4	69.2
2018	2.9	1.3	11.1	2.8	5.6	11.0	4.0	6.4	22.6	3.9	71.6
2019	1.8	0.3	11.9	1.9	6.3	14.6	3.7	8.7	20.4	2.8	72.4
2020	1.7	0.3	12.0	2.3	6.0	13.2	3.8	6.2	22.8	2.1	70.4
2021	1.7	0.3	14.7	2.6	5.7	13.6	3.5	6.5	21.9	2.0	72.5
2022	1.7	0.6	14.2	2.5	5.5	12.6	3.4	6.3	21.4	1.9	70.0
2023	2.0	0.7	14.8	2.4	5.7	13.8	3.6	6.7	22.1	1.9	73.7
2024	1.8	0.6	16.0	2.4	6.0	14.6	3.6	7.6	21.0	2.0	75.5
2025	1.5	0.4	16.2	2.3	6.4	14.8	3.4	6.8	21.2	2.0	75.0

Source: Authors, Slovak Statistical Office (Labour Force Survey)

Table 2.5:
Average annual demand and supply of labour force, 2018-2022, by level and field of education

Educational level	Indicator	Education	Arts and humanities	Social sciences, journalism and information	Business, administration and law	Natural sciences, mathematics and statistics	Information and Communication Technologies	Engineering, manufacturing and construction	Agriculture, forestry, fisheries and veterinary	Health and welfare	Services
Secondary education	Expansion demand	-0.3	0.6	0	1.3	-0.1	0.5	-9	-1.1	0.5	2.4
	Replacement demand	0.9	0.7	1.1	7.4	0.6	0.3	28.4	3.3	2.2	5.3
	Total demand	0.6	1.2	1.1	8.7	0.4	0.7	19.4	2.2	2.7	7.7
	Graduates	0.2	0.6	0.5	4.7	0.2	0.5	12.5	1.4	1.4	4.8
Tertiary education	Expansion demand	1.2	1.6	1.9	4.5	1	1.2	3.7	0.4	2.2	3.7
	Replacement demand	2.4	1	1.5	1.7	0.6	0.2	3.5	0.7	1.7	0.6
	Total demand	3.6	2.6	3.4	6.2	1.6	1.3	7.1	1.1	3.9	4.3
	Graduates	2.3	1.7	2.3	5	1.1	1.2	6.7	0.9	2.8	4

Source: Authors

3 ACTIVE LABOUR MARKET POLICIES IN SLOVAKIA – OVERVIEW OF THE AVAILABLE EVIDENCE

Miroslav Štefánik

This chapter aims to present available evidence on the impact of the active labour market policies (ALMPs) in Slovakia. Additionally, we highlight few aspects of the Slovak labour market which are relevant from the perspective of the design and implementation of ALMPs. For a broader description of the issues surrounding the increased unemployment in Slovakia, see, for example, the report of Machlica et al. (2014). Domonkos (2018) describes the development of employment policies in Slovakia, during the same period, using the lenses of the political debate and changes of the ruling parties. Kureková and Duell (2013) provide one of the first comprehensive descriptions of the institutional environment in which ALMPs in Slovakia are being implemented.

Here we focus purely on existing evidence on the impact of ALMPs in Slovakia, as measured at the micro level. The third section provides a list of available up-to-date studies applying techniques of counterfactual impact evaluation. We present a brief overview of their findings, with references to published papers, evaluation reports or journal articles. The first section provides a brief comparison of unemployment in Slovakia compared to the EU. The second section places the reader in the context of providing ALMPs to registered jobseekers in Slovakia. Conclusions are phrased in the last, fourth section.

3.1 Unemployment in Slovakia in comparison to the EU

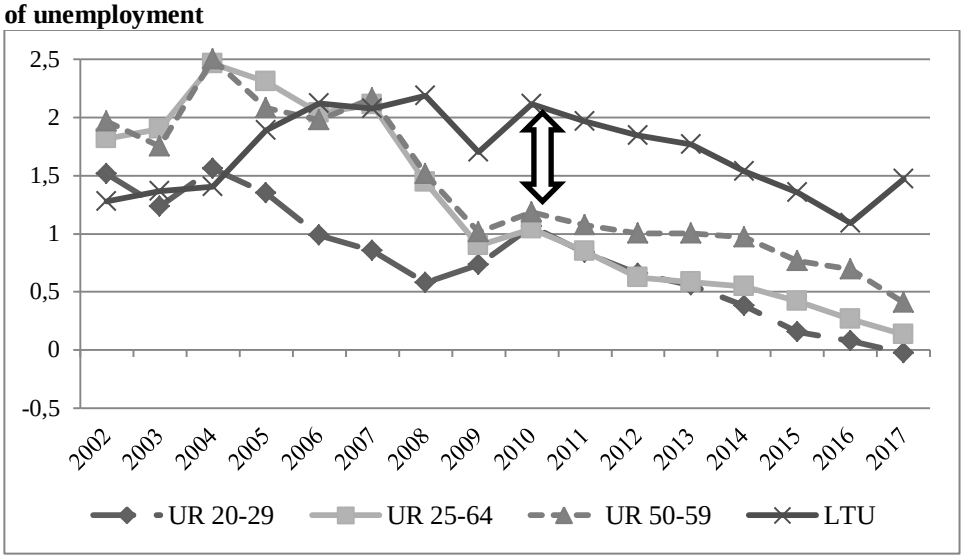
During the long period of 1999 to 2008 Slovakia ranked among the top three EU countries with the highest unemployment rate[28]. This was a result of a reduced demand for labour resulting from a relatively slower and postponed transformation process, in combination with strong inflows of labour supply driven by demographics. Although the hit of the economic crisis in 2008 twisted the declining trend in the unemployment rate in Slovakia, the Baltic countries and Spain were hit harder and replaced Slovakia on top of the EU "unemployment rate" peloton. Nevertheless, unemployment clearly remained one of the most

[28] Based on the EU-LFS for the main age group of 25–64 years old.

urging concerns, as perceived not only within the country but also internationally (European Commission 2013, 2014, 2015, 2016).

The Employment Committee of the European Commission proposes a quantitative methodology with which to identify policy challenges. This is based on a comparison of the member states with respect to the EU average. Here we run the proposed procedure on unemployment-based indicators to display the relative position of Slovakia in comparison to the average of the EU-28.

Figure 3.1:
Standardised difference of Slovakia from the EU-28 average on selected indicators of unemployment



Note:
UR 20–29 – The unemployment rate of 20–29 years old
UR 25–64 – The unemployment rate of 25–64 years old
UR 50–59 – The unemployment rate of 50–59 years old
LTU – Long-term unemployment (12 months or more) as a percentage of the total unemployment
Source: Eurostat, [lfsa_urgan, lfsa_upgan]

Following the methodology proposed by the Joint Assessment Framework, to identify the key employment challenges (European Commission 2010, p.10), we have counted the difference of each indicator's national value from its EU average and have expressed it in terms of the standard deviation. Figure 3.1 displays the development of this standardised distance to the EU average on four selected indicators of unemployment:

- the unemployment rate of the young (20–29 years of age);
- the unemployment rate of the main age group (25–64 years of age);

- the unemployment rate of the elderly (50–59 years of age);
- long-term unemployment as a percentage of the total unemployment.

Tracing the development of the relative position of Slovakia in comparison to the EU average, we may observe the distinction between two sub-periods. During the first, the pre-crisis period (up to 2008), the highest concern was the unemployment rate of the main age group and the elderly. Surprisingly, the values of the youth unemployment rate showed a relatively lower distance to the EU average.

In the second, the post-crisis sub-period (after 2008), Slovakia was clearly converging to the EU average in terms of the unemployment rate, which was observable for all of the selected age groups. It was partially driven by the increase in the average unemployment rate in the EU, but also by the decline of the Slovak figures[29]. The other side of this story concerns the increasing distance of Slovakia on the indicator of the share of long-term unemployed among the total number of unemployed.

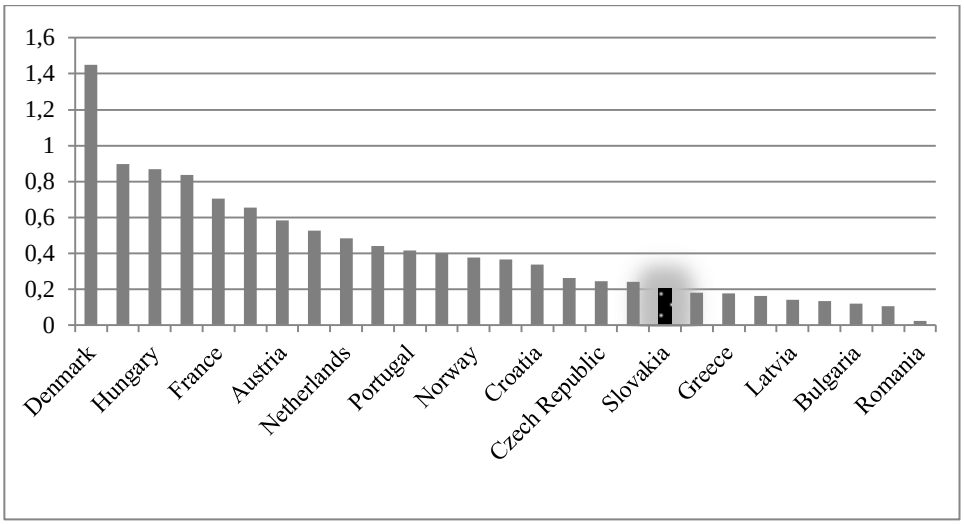
The post-crisis period, with increased unemployment, also detained those who would under normal economic conditions be in proper employment. This pressed those, usually transiting between employment and unemployment, to the back of the line of unemployed. In a situation of low access to active labour market policy measures (ALMPs) a substantial share of such individuals prolonged their unemployment spells and increased the share of long-term unemployed among the total number of unemployed.

3.2 Accessibility of Active Labour Market Policies in Slovakia

In contrast to the historical underperformance of Slovakia in terms of unemployment are the resources invested in tackling this problem. When examining only the active labour market policies (types 2–7 according to the Eurostat definition of LMPs), Slovakia ranked nineteenth among the 27 reporting EU countries in 2016.

[29] Please find the source values of the selected indicators of unemployment in the Annex (A1).

Figure 3.2:
Expenditures on active labour market policies (LMP types 2–7), as a % share of GDP (2016)



Note: 2016 is the most recent period available as of the end of 2018
Source: Eurostat, [lmp_expsumm]

The expenditures on active labour market programmes in 2016 were only slightly above 0.2 per cent of the Slovak GDP. Furthermore, the structure of these expenditures differed from the EU average — Slovakia spends relatively less on training and more on employment incentives (Hidas et al. 2016). It was partially a result of the past development in the labour market. In the situation of overlapping labour supply in respect of the demand side, existing policies aim to compensate by stimulating the demand side of the labour market with funding flowing to employers rather than jobseekers.

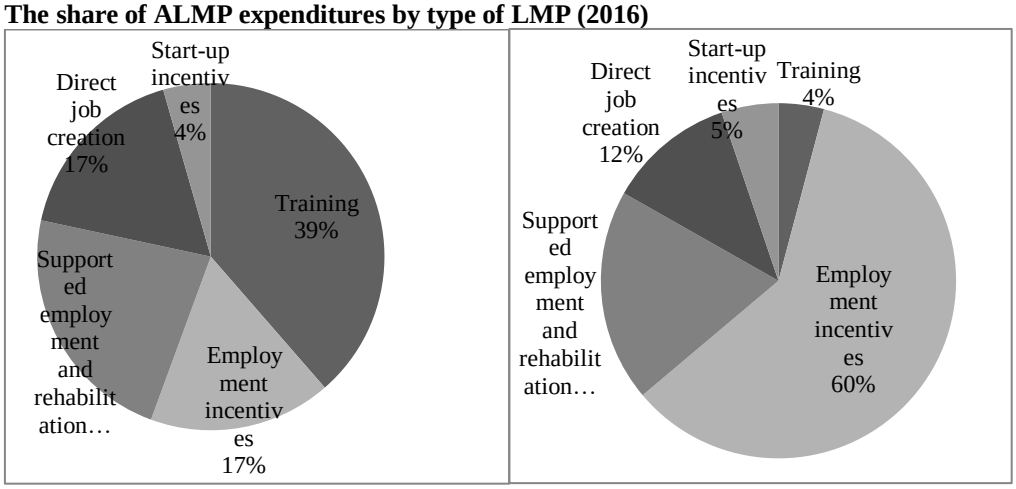
The overlap of the supply side in the Slovak labour market started to disappear after 2015, not only as a result of good economic performance (steady growth of demand) but also because of population ageing. In this changed situation, investing in labour supply through training becomes more promising.

Moreover, as assessed per participant, training usually is less expensive than measures incentivising employment. Reorienting towards training measures could, thus, increase the low accessibility of ALMPs to jobseekers without an increase in the total ALMP budget.

Only around 15 per cent of jobseekers entered any of the ALMP measures within 12 months after being registered by COLSAF from 2007 to 2012. This share further declined after the end of 2012. Such accessibility does not change

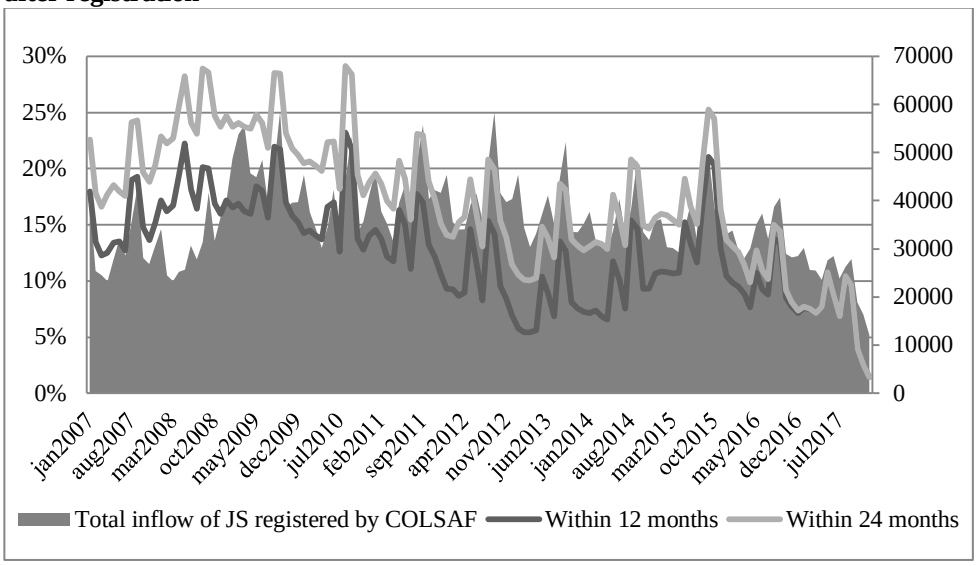
significantly even 12 months after registration. The share of jobseekers entering any ALMP measure within 24 months is only marginally higher.

Figure 3.3:
The share of ALMP expenditures by type of LMP (2016)



Source: Eurostat, [lmp_expsumm]

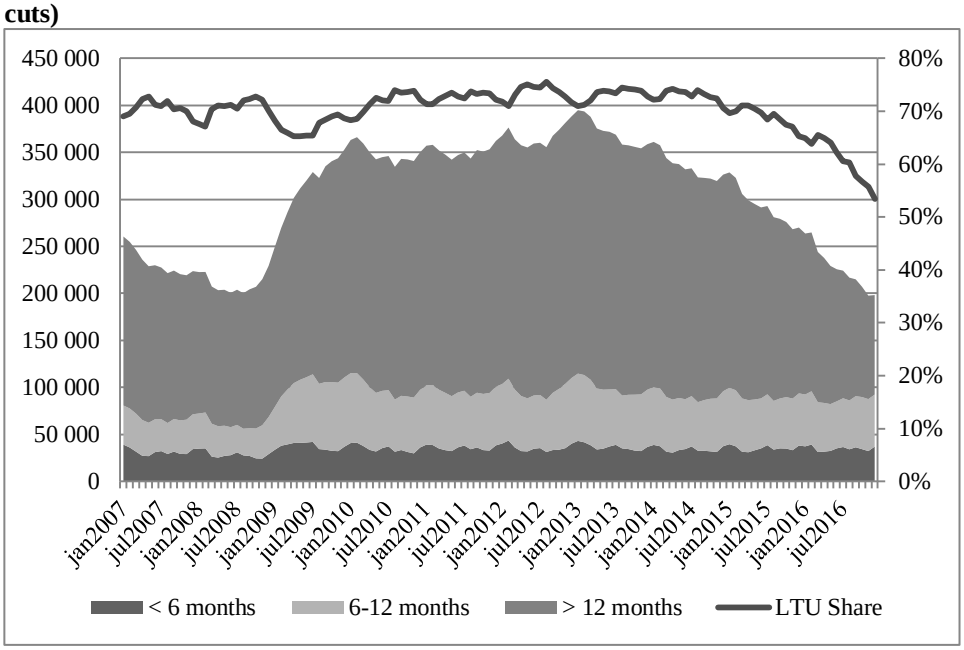
Figure 3.4:
Share of registered jobseekers entering ALMP measures within 12 and 24 months after registration



Note: Left axis: % share of those JS entering one of the ALMP measures 12/24 months after registration, of the total number of jobseekers registered by COLSAF in the particular month (right axis)
Source: COLSAF Database

During the same period, the share of unemployment spells longer than 12 months remained around 70 per cent of the stock of unemployed jobseekers registered by COLSAF. When crosscutting the stock of unemployment spells of jobseekers registered by COLSAF, 10 to 15 per cent of them end within six months; another 15 to 20 per cent end between the sixth and twelfth months.

Figure 3.5:
Stock of registered jobseekers by the duration of unemployment (monthly crosscuts)



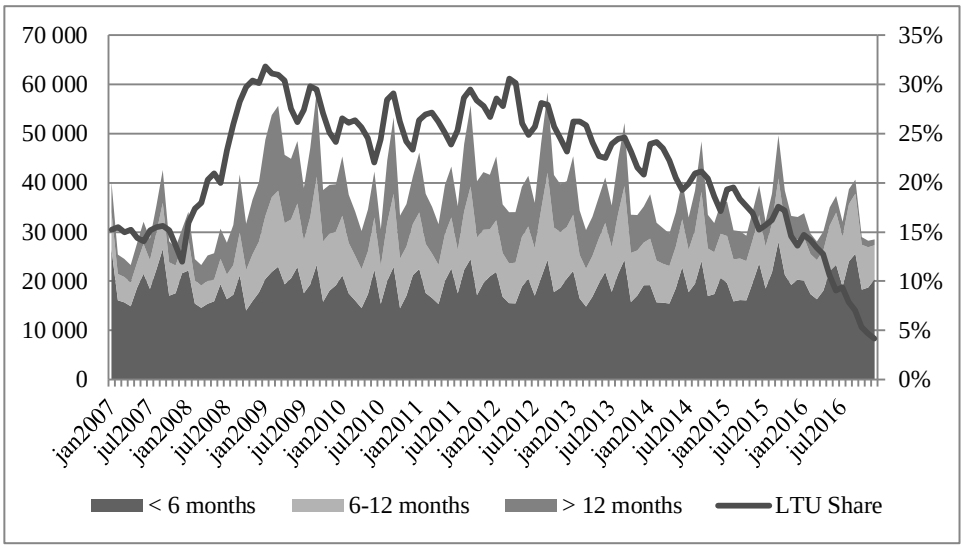
Note:
Left axis: Number of jobseekers by the duration of their unemployment – evaluated after the end of the spell – series of crosscuts of the stock of unemployed in the database on a monthly basis
Right axis: The % share of unemployment spells lasting for more than 12 months
Source: COLSAF Database

In contrast, when examining the inflow of jobseekers, only approximately 25 per cent of inflowing jobseekers remained in unemployment for more than 12 months during the post-crisis period. This share further declined after the end of 2012. This explains the structure of inflowing jobseekers. Slightly less than a half of them return to the labour market within six months.

Combining the pictures obtained when exploring the duration of stock and flow of unemployment spells shows us the hit of the economic crisis, with a clear increase in the inflows as well as the stock of jobseekers in 2009. It also documents the subsequent increase in the share of long-term unemployed.

Figure 3.6:

Inflow of registered jobseekers into unemployment by the duration of the unemployment spell (monthly inflow cohorts)



Note: Left axis: Number of unemployment spells by their duration – evaluated after the end of the spell – monthly inflow cohorts into unemployment; Right axis: The % share of unemployment spells lasting for more than 12 months

Source: COLSAF Database

Combining these pictures also suggests that when designing the ALMPs in Slovakia, the attention should focus towards decreasing the share of the long-term unemployed. Moreover, it is clear that the decline in the total (stock of) registered jobseekers observable after the end of 2012 has, with some postponement, resulted in an unprecedented decline in the share of long-term unemployment. Considering the low accessibility of ALMP measures to jobseekers, this decline was dominantly driven by other factors, such as a steady growth of labour demand and population ageing (with more numerous cohorts leaving for retirement in contrast to less numerous cohorts entering the labour market as graduates).

When assessed either from an international comparison or based on the nation-specific administrative data, the urge for activating long-term unemployed is pronounced. ALMP measures present one of the few potentially activating tools addressing this group of interest. A wide variety of ALMPs have been in operation in Slovakia since 2007. Table 3.1 provides a summary of these ALMP measures in operation in 2018, with linkages to the Labour Market Policy Database administrated by Eurostat. The following section picks up some of these ALMP measures and complements the available evidence on their impact measures in various periods of time.

Table 3.1:
Active labour market policy measures in operation in Slovakia during 2018

LMP type	Name of the measure English/Slovak	Target group	Eurostat LMP code	Reference to the Slovak law on employment services	Number of entrants in 2016
Training	Education and preparation for the labour market of the job seeker/Vzdelávanie a príprava pre trh práce uchádzača o zamestnanie	Jobseekers – all registered	21_SK4	§46	0
	Project – Education and training/Národný project REPAS	Jobseekers – all registered	21_SK39_1	§54 – REPAS	15,306
	Vocational education and training of employees/Vzdelávanie a príprava pre trh práce zamestnanca	Employees	22_SK41	§47	208
Employment incentives	Contribution to support employing a disadvantaged job seeker/Príspevok na podporu zamestnávania znevýhodneného uchádzača o zamestnanie	Jobseekers – disadvantaged	41_SK6	§50	1,748
	Contribution to support regional and local employment/Príspevok na podporu rozvoja miestnej a regionálnej zamestnanosti	Jobseekers – disadvantaged	41_SK34	§50j	2,089
	Contribution supporting the retention of jobs/Príspevok na podporu udržania pracovných miest	Employees	42_SK40	§50k	0
	Contribution to support job creation in the first regular paid employment/Príspevok na podporu vytvorenia pracovného miesta v prvom pravidelne platenom zamestnaní	Jobseekers – below 29/25 years of age – registered for at least 3/6 months	41_SK42	§51a	3,091
	Contribution for the graduate practice (*Graduate practice*)/Príspevok na vykonávanie absolventskej praxe	Jobseekers – graduate from education	41_SK7	§51	5,652
	Contribution for commuting to work/Príspevok na dochádzku za prácou	Jobseekers – registered for at least 3 months	41_SK20	§53	4,916
	Relocation allowance when taking up a new job/Príspevok na podporu mobility za prácou	Jobseekers – registered for at least 3 months	41_SK25	§53a	53

LMP type	Name of the measure English/Slovak	Target group	Eurostat LMP code	Reference to the Slovak law on employment services	Number of entrants in 2016
Supported employment and rehabilitation	Contribution for establishing a protected workshop and protected workplace/Príspevok na zriadenie chránenej dielne alebo chráneného pracoviska	Jobseeker – with health disability	51_SK10	§56	375
	Contribution for activities of the assistant at work/Príspevok na činnosť pracovného asistenta	Jobseeker – with health disability	51_SK12	§59	989
	Contribution for reimbursement of operating costs of a sheltered workshop or a sheltered workplace and for transport expenses for employees/Príspevok na úhradu prevádzkových nákladov chránenej dielne alebo chráneného pracoviska a na úhradu nákladov na dopravu zamestnancov	Jobseeker – with health disability	51_SK13	§60	32,912
	Subsidies to sustain jobs for disabled workers/Príspevok na udržanie občana so zdravotným postihnutím v zamestnaní	Jobseeker – with health disability	51_SK26	§56a	26
Direct job creation	Contribution for activation activity in the form of voluntary works (*Activation works*)/Príspevok na aktivačnú činnosť formou dobrovoľníckej služby	Jobseekers – all registered	6_SK24	§52a	9,438
	Contribution for activation activity in the form of minor communal services performed for a municipality or minor services for a self-governing region/Príspevok na aktivačnú činnosť formou menších obecných služieb pre obec alebo formou menších služieb pre samosprávny kraj	Jobseekers – registered for at least 12 months or social benefit recipients	6_SK8_2	§52	17,821
Start-up incentives	Contribution to self-employment/Príspevok na samostatnú zárobkovú činnosť	Registered jobseekers	7_SK5	§49	1,951
	Contribution for operating or performing self-employment to disabled citizens	Disabled, registered jobseekers	7_SK11	§57	75

Source: Eurostat – Labour Market Policy Database [lmp_partme_sk]; Employment Services Act No. 5/2004 Coll.

3.3 Evidence on the impact of Active Labour Market Policies in Slovakia

The accessibility of ALMPs is an important precondition for the activation of registered jobseekers and, thus, tackling long-term unemployment. Another side of the same coin concerns the impact of provided ALMPs. Considering the amount of resources flowing into ALMPs, the attention devoted to evaluating their impact is relatively small. We want to summarise the information from existing impact evaluations of Slovak ALMPs available up until the year 2018. We only focus on the impact evaluations carried out using counterfactual impact evaluation techniques. All of them rely on experimental data because no randomised trials were organised to measure the impact of Slovak ALMPs.

3.3.1 The Nineties

As a part of former Czechoslovakia, Slovakia was a part of the bloc of European socialist countries. Under the socialist regime, unemployment did not exist by definition. Every member of the socialistic society had a right to work. This right was, naturally, linked with significant overemployment. After the Velvet Revolution at the end of 1989, unemployment jumped rapidly from practically zero to approximately 300,000 in 1991, corresponding to the unemployment rate of circa 12 per cent (OECD 1996; Van Ours and Lubyová 1999).

Furthermore, after the split of Czechoslovakia in 1993, the young infrastructure of public employment services had to become operational in an autonomous way. Inheriting the model of former Czechoslovakia, unemployment benefits were insurance-based. Its distribution, together with the implementation of still-juvenile ALMPs, was in the competency of the National Labour Office. This was an independent body responsible for both the collection of contributions from the employed and their redistribution in unemployment benefits and ALMPs.

Most of the available studies from this period are focusing on the effects of unemployment insurance and its frequent reforms on the duration of unemployment or the exit rates from unemployment (Ham, Svejnar and Terrell 1996[30]; Lubyová and Van Ours 1997[31]; Lubyová and Van Ours 1998)[32].

[30] The effects of the unemployment compensation system on the duration of unemployment.
[31] The effects of unemployment insurance reforms on the exit rates from unemployment are not significant, but significant effects can be observed on economic activity.

There is only one study specifically examining the impact of participation in ALMPs. Van Ours and Lubyová (1999) processed administrative data for 20 districts of the National Labour Office. After accounting for the problem of selection with respect to the programmes, they apply a duration type of model estimating the change in the survival/hazard rate of remaining in unemployment.

Until the end of 1996, ALMPs in Slovakia contained the following measures: socially purposeful jobs (supported employment in the private sector); publicly useful jobs (public work type of programme); retraining; counselling; sheltered workplaces for the disabled; subsidies for shortened working hours; and places for graduates (ibid., p.4).

Authors look specifically at three of them: socially purposeful jobs, publicly useful jobs, and retraining. After accounting for selectivity, they find an overall positive effect of participating in ALMPs on the exit rates into employment. The positive effect is driven mainly by the retraining programme and publicly useful jobs; the most numerous programme — socially purposeful jobs — was linked with negative effects on the transition rate from unemployment to employment.

3.3.2 Renaissance after the Year 2010

The first decade after the year 2000 was a quite turbulent period for the public employment services (PES) in Slovakia. In 2004, the National Labour Office was transformed into the Central Office of Labour, Social Affairs and Family (COLSAF). The original institution was responsible for collecting unemployment insurance contributions, as well as for distributing unemployment benefits, together with implementing the active labour market policy measures. In the new model, COLSAF became an implementing agency under direct management of the Ministry of Labour, Social Affairs and Family (MLSAF). COLSAF was not any more responsible for the collection of contributions from unemployment insurance, thus losing its independence in own resource collection. In this respect, COLSAF started to become dependent on the resources allocated to it by the Ministry (MLSAF). The Slovak public employment service (PES) model, thus, changes to a different[33] type, from an autonomous, insurance-based PES provision to a centralised and dependent executive agency with 46 regional offices. Jointly with this change, a new version of the Act on employment services was also adopted in 2004 (Employment Services Act No. 5/2004 Coll.), defining the main framework for active labour market policy provision until today (2018).

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[32] Disincentive effects of unemployment insurance and social assistance benefits.
[33] In line with the distinction applied in Manoudi (2014, p.9).

Together with these changes, internal processes at COLSAF and its regional offices were revised, together with designing a new information system with necessary data migrations. This was a laggard process blocking the possibilities of employing administrative data in evaluating the operating active labour market policy measures. Partially also for this reason, there was a quite long period without any studies published on the impact of existing ALMP measures.

The only exemption from this period was the study by Harvan (2011). This study employs microdata from the Labour Force Survey (LFS) to provide an estimate of the impact of the two most numerous measures in operation from 2006 to 2009. The study identifies individuals in the LFS sample and estimates the treatment effects on employment, applying a simple, exact matching approach (on age group and region). Additionally, the study provides a simple cost–benefit assessment of the measures. For the *Graduate practice*, the study reports a positive and statistically significant effect of approximately three percentage points. For the most numerous *Activation works*, negative and statistically significant effects are reported at a magnitude of -6.3 percentage points.

In circa 2012, the first provisions of administrative data from the redesigned and migrated COLSAF database were reported. The first impact evaluation of ALMPs using such data was published in 2014 (Štefánik et al. 2014). This study evaluates six selected ALMP measures in operation during 2011 and examines their impact on the employment of participants up to 15 months after their participation. The selected measures shelter approximately three quarters of all ALMP participation in the country during 2011. Propensity score matching is applied to evaluate the impact of all the six measures, among which are the following:

- the only training programme in operation in that time: *Education and preparation for the labour market of the job seeker*[34];
- two programmes of employment incentives in the public sector:
    - *Contribution to support regional and local employment*[35]
    - *Contribution supporting the development of local and regional employment*[36];
- the already mentioned *Graduate practice*, later renamed the *Contribution for the graduate practice*, a workplace insertion to support working experience collection;

[34] Translation according to the Labour Market Policy Database administrated by Eurostat, [lmp_partme_sk – code: 21_SK4].
[35] Translation according to the Labour Market Policy Database administrated by Eurostat, [lmp_partme_sk – code: 41_SK34].
[36] Translation according to the Labour Market Policy Database administrated by Eurostat, [lmp_partme_sk – code: 41_SK35].

- a "public work" type of programme, the *Contribution for activation activity in the form of minor communal services performed for a municipality or minor services for a self-governing region*[37];
- variation of the "public work" type of programme into a workplace insertion, the *Contribution for activation activity in the form of voluntary works*[38].

Strong, significant, positive, but only short-term employment effects were observed for the two programmes providing employment incentives. Positive and statistically significant employment effects of the *Graduation practice*, as already observed by previous studies (Lubyová and Van Ours 1999; Harvan, 2011), were also confirmed by this study. A positive and statistically significant effect on employment was also estimated for the *Contribution for activation in the form of voluntary works.* Interestingly, the original "public work" type of programme from which it evolved, the *Contribution for activation activity in the form of minor communal services performed for a municipality or minor services for a self-governing region*, shows clear negative and statistically significant effects. However, the most striking were the statistically significant, negative employment effects observed for the only provided training programme — *Education and preparation for the labour market of the job seeker*.

Authors also pointed at significant differences in the impact of the measures between regional offices with cases in which the same programme showed a different impact in two neighbouring regions of comparable economic performance. Another conclusion drawn from this study was that the richness of the administrative data provided by COLSAF, together with the low accessibility of the ALMP measures, provides a favourable context for identification strategies based on matching (such as the applied).

Another study from that period (Bořík et al. 2015) benefitted from an additional interconnection of the updated COLSAF information system with other administrative databases[39]. This data was employed to evaluate the impact of the *Graduate practice* (resp. *Contribution for the graduate practice*) and the *Contribution to support self-employment*[40]. The authors applied cluster analysis and exact and nearest neighbour matching. Despite reporting results which are heter-

[37] Translation according to the Labour Market Policy Database administrated by Eurostat, [lmp_partme_sk – code: 6_SK8].
[38] Translation according to the Labour Market Policy Database administrated by Eurostat, [lmp_partme_sk – code: 6_SK24].
[39] The Social Insurance database of clients as well as other country-specific information sources on the self-employed.
[40] Translation according to the Labour Market Policy Database administrated by Eurostat, [lmp_partme_sk – code: 6_SK24].

ogeneous across the various methods applied, they conclude that the *Graduate practice* has a positive impact on employment and employment stability; the *Contribution to support self-employment* negatively impacts upon the duration of self-employment.

At nearly the same time, in 2014, another evaluation activity benefitted from connecting the COLSAF database with the Social Insurance database (Bondonio and Nemec 2015; Štefánik 2014). It focused on training provided by COLSAF between 2007 and 2013. The authors report OLS and propensity-score-matching-based estimations of employment as well as income effects related to participation in the only training measure[41] available to registered jobseekers during that period. They document statistically significant and positive employment as well as income effects of training in the pre-crisis period of 2007–2008. Later, with the introduction of the obligatory centralised procurement of training providers, the effects of the measure continuously shifted from positive and significant to negative and statistically significant effects on both employment and income[42].

Another study using the same data[43] was prepared under the Institute for Financial Policy of the Ministry of Finance of the Slovak Republic (Hidas et al. 2016). The authors apply propensity score matching to evaluate the employment effect of the following ALMP measures:

- *Graduate practice,*
- *Contribution to support self-employment,*
- *Contribution for activation activity in the form of minor communal services performed for a municipality or minor services for a self-governing region,*
- *Contribution for activation activity in the form of voluntary works,*
- *Contribution to support regional and local employment,*
- *Two programmes of employment support in the private sector.*

In line with previous studies (Štefánik et al. 2014; Harvan 2011), they confirm a negative employment effect of the *Contribution for activation activity in the form of minor communal services performed for a municipality or minor services for a self-governing region.* All other evaluated measures, surprisingly[44]

[41] Education and preparation for the labour market of the job seeker.
[42] More details on the training provided to registered jobseekers in Slovakia can be found in the subsequent chapter evaluating the REPAS programme.
[43] Administrative data on registered jobseekers, as provided by COLSAF, linked to the Social Insurance database.
[44] A variant of the, negatively assessed, Contribution for activation activity in the form of minor communal services performed for a municipality or minor services for a self-governing region.

also including the *Contribution for activation activity in the* form *of voluntary works*, showed a positive employment effect. The authors further compare the measures linked with a positive employment effect in terms of a cost–benefit assessment. Based on this, they point at a relatively higher cost related to participation in the two programmes of employment support in the private sector (*Contribution to support regional and local employment* and *Contribution to support self-employment*). The *Graduate practice*, together with the *Contribution for activation activity in the form of voluntary works*, thus, in terms of cost–benefit assessment, appeared to be the best option out of the list of the evaluated ALMP measures. Finally, the authors calculate an index of repayment time from the perspective of the State budget for each of the evaluated ALMP measures (Hidas et al. 2016, Table 3.3).

Another evaluation, applying counterfactual impact evaluation techniques in respect of Slovak administrative data, can be found in Štefánik and Karasová (2015) and Štefánik and Karasová (2016). The authors focused on a rather specific type of ALMP measure. They evaluate two measures designed to support the spatial mobility of registered jobseekers:

- *Contribution for commuting to work*[45],
- *Contribution for resettlement* (*relocation allowance when taking up a new job*[46]).

As outcomes, income and employment are considered together with the commuting time in the new job. Both measures show favourable results on all outcomes of interest. Jobseekers registered for at least three months, if receiving a contribution to cover commuting/resettlement-related costs when entering a new job, are commuting farther[47], earning more and being more likely to be employed after the support dries out.

Štefánik, Karasová and Studená (2016 and 2018) examine the long-term effects of participation in the *Graduate practice*, reporting effects obtained by propensity score matching, inverse probability weighting as well as an instrumental-variable-based approach. Examining the cohort of participants finishing the *Graduate practice* between January 2007 and April 2008, they reveal a positive employment effect, which is even increasing 36 months after participation. In contrast, they estimate a negative income effect. In Štefánik et al. (2018) the

[45] Translation according to the Labour Market Policy Database administrated by Eurostat, [lmp_partme_sk – code: 41_SK20].
[46] Translation according to the Labour Market Policy Database administrated by Eurostat, [lmp_partme_sk – code: 41_SK25].
[47] In the case of the Contribution for commuting to work.

authors further discuss potential interactions between private and public sector effects, as a dominant share of *graduate practices* takes place in the public sector. They also focus on possible interactions with the hit of the economic crisis but find no significant association with the indicators of the economic crisis. In Štefánik et al. (2016) the authors explore the dose-response function of the length of participation in the *Graduate practice.* A comparison based on a contrast between the impact of the *Graduate practice* and two alternative measures[48] available to young, registered jobseekers in Slovakia during 2011 can be found in Štefánik (2018).

3.4 Conclusions

This chapter aims to provide a summary of existing evidence on the impact of the ALMP measures in operation in Slovakia. The legal framework supporting the implementation of current ALMPs in Slovakia was set up in 2004. Since then, its main features have undergone only minor changes, with the backbone ALMP measures[49] changing only in details. In contrast, the context in which the ALMP measures are being implemented changes quite substantially. From long-term experience with an oversupply of labour, the Slovak labour market twisted towards an inverse picture, experiencing a lack of workforce. The decline in the unemployment rate in the last years was unprecedented. Nevertheless, the share of long-term unemployed remains high, as compared internationally as well as assessed based on the dynamics of inflows into unemployment.

Relatively low accessibility of ALMP measures contributes to the high share of long-term unemployed. Only a marginal share of registered jobseekers get into an ALMP measure more than 12 months after registration. Moreover, the dominant ALMP measure targeting the long-term unemployed (*Activation works*) is linked with a significant stigmatising effect, resulting in negative employment effects after participation[50].

Existing ALMPs, thus, seem to provide only a very limited impact on the group of clients which are becoming even more in focus. For this reason, the ALMPs in Slovakia could benefit from a well-designed reform of the provision of measures for those who are in high need of activation or an increase in their employability.

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[48] Namely the Contribution for activation activity in the form of minor communal services performed for a municipality or minor services for a self-governing region and the Contribution for activation activity in the form of voluntary works.
[49] The Graduate practice, Activation works, etc.
[50] Confirmed by multiple evaluation studies (Harvan 2011; Štefánik et al. 2014; Hidas 2016).

Such a reform could be based on the profiling of clients at registration based on their distance to the labour market and a subsequent segmented provision of services and ALMP measures. Together with the recent decline in the workload of caseworkers, profiling and segmentation could be ways of employing the existing capacities of COLSAF in providing intensified services to those at high risk of long-term unemployment. Furthermore, thanks to profiling at registration, the first PES intervention might come earlier during the unemployment spell.

As the workforce becomes scarce, investments in its best labour market utilisation become linked with higher returns. This involves training provision. Making publicly funded training available to jobseekers during unemployment spells should assure a real option for a change in the current career trajectory, or upskilling within the existing one. The Slovak ALMPs have been naturally moving towards this direction in the last years. An important element of this move was the project REPAS, whose impact evaluation is presented in the following chapter of this book.

3.5 Appendix:

Table 3.2: Absolute values of the selected indicators of unemployment (used in Figure 3.1)

	UR 20–29		UR 25–64		UR 50–59		LTU	
	EU-28	**Slovakia**	**EU-28**	**Slovakia**	**EU-28**	**Slovakia**	**EU-28**	**Slovakia**
2002	13.9	24.9	7.8	15.4	6.9	15.2	45.4	65.3
2003	14.0	21.7	7.9	14.6	6.8	13.8	45.8	66.2
2004	14.2	23.2	8.0	16.5	7.3	16.9	45.0	63.9
2005	13.8	20.5	7.7	14.4	6.9	13.6	46.2	71.9
2006	12.4	16.5	7.1	11.7	6.5	11.4	46.0	76.3
2007	10.8	13.8	6.1	10.0	5.6	9.7	42.9	74.2
2008	10.8	12.7	6.0	8.5	5.3	7.9	37.1	69.6
2009	14.2	17.8	7.6	10.5	6.4	9.6	33.3	54.0
2010	15.3	21.9	8.3	12.5	7.0	11.8	39.9	64.0
2011	15.7	21.5	8.4	11.8	7.0	11.0	42.9	67.9
2012	17.0	22.5	9.2	12.2	7.5	11.7	44.5	67.3
2013	17.7	23.0	9.6	12.6	7.9	12.3	47.3	70.2
2014	16.6	20.0	9.1	11.8	7.6	11.8	49.6	70.2
2015	15.1	16.4	8.4	10.3	7.2	10.3	48.5	65.8
2016	13.7	14.3	7.6	8.7	6.6	9.3	46.9	60.2
2017	12.2	12.0	6.8	7.3	5.9	7.3	45.2	62.4

Note:
UR 20–29 – The unemployment rate of 20–29 years old
UR 25–64 – The unemployment rate of 25–64 years old
UR 50–59 – The unemployment rate of 50–59 years old
LTU – Long-term unemployment (12 months or more) as a percentage of the total unemployment
Source: Eurostat, [lfsa_urgan, lfsa_upgan]

4 LET´SMAKE IT THE CLIENTS DECISION – IMPACT EVALUATION OF INNOVATED TRAINING FOR REGISTERED JOB SEEKERS – REPAS

Miroslav Štefánik

Resources flowing into training measures as part of the Slovak ALMPs funding make up a relatively small slice of the pie, compared to the allocation observed at the EU level[51]. This has resulted in a situation whereby the accessibility of any publically funded training to registered job seekers was practically zero.

During the period 2010–2013, only one out of the whole package of ALMP measures implemented in Slovakia was a training measure targeting registered jobseekers without a health disability. This measure was called *Education and preparation for the labour market of the job seeker*[52]. Its implementation was linked with severe problems, which culminated in an extreme decline in the number of participants during the years 2011 and 2013. Less than 2 000 registered jobseekers participated in this measure during this period, versus the approximately 600 000 eligible jobseekers[53].

Moreover, even this, the only option available, was hampered by severe implementation problems, resulting in participation in this training having a negative impact on future employment chances. Available impact evaluation studies looking at the training provided during that period document a decline in the originally positive treatment effects (period: 2007–2008) towards negative effects in the later period (2012-2013) (Bondonio and Nemec 2014, Štefánik 2014). The effects considered were on employment as well as income, both showing the same declining pattern. The timing of the decline, as well as interviews with COLSAF officers, pointed at the newly introduced obligation[54] to procure training providers centrally as one of potential triggers of the decline in the impact of the measure (Bondonio and Nemec 2014).

[51] See, for example Figure 3.3 in the previous chapter.
[52] In Slovak: Vzdelávanie a príprava pre trh práce uchádzača o zamestnanie (§46).
[53] Based on COLSAF, the average monthly stock of registered jobseekers in 2013 was 415 006, but the number of eligible was clearly over 600 000 because of the flows within the calendar year (the exact figure changes based on the definition applied).
[54] Implemented around 2010.

Table 4.1:
The number of entrants into ALMP training measures

Year	RE-PAS	Education and preparation for the labour market of the job seeker	Vocational education and training of employees	Work preparation for disabled	Benefits during labour market training for the disabled	Training (category 2)	Total LMP measures (categories 2-7)
2010		8 824		87	466	9 377	173 748
2011		1 384		:	18	1 402	129 787
2012		1 816		:	353	2 169	105 866
2013		1 629		:	:	1 629	104 986
2014	81	6 576	1 631	:	:	8 288	108 528
2015	16 863	1 465	104	:	:	18 432	143 878
2016	15 306	0	208	:	:	15 514	168 895

Source: Eurostat [lmp_partme_sk].

Project REPAS was supposed to be a way out of this situation. Its design removed the obligation to publically procure the training provider. This was achieved by allowing the job seeker (client) to decide on the field, as well as the training provider. Otherwise, the design of the measure remained rather general. Similarly, as in the case of the *Education and preparation for the labour market of the job seeker*, in the case of REPAS, all job seekers registered by COLSAF were eligible for the training from the first day of registration; there were no restrictions on the thematic focus or length of the training.

Introducing REPAS at the very end of 2014 significantly contributed to the increase in the availability of publically financed training to jobseekers registered by COLSAF. The number of jobseekers participating in ALMP-financed trainings increased almost ten-fold, from 1 629 participants in 2013 to 15 306 participants in 2016. At the same time, the percentage of ALMP participants taking part in training grew from 1 percent in 2011 to over 9 percent in 2016.

Despite the obviously positive impact of REPAS on the accessibility of ALMP-financed training to registered jobseekers, the Supreme Audit Office of the Slovak Republic, a national controlling authority, published a report concluding that REPAS was having a poor impact on participants' employment (SAOSR, 2018). In this context, we are addressing the question of the impact training provided under project REPAS in the first half of 2015 had on partici-

pants' post-participation employment and income. In addressing this question, we rely on a counterfactual impact evaluation technique, estimating the net impact rather than producing simple descriptive statistics.

In the following section we further describe the REPAS program, our data and our sample. Afterwards, we outline our empirical strategy to estimate the impact. The third subsection presents the main results, together with a simple cost–benefit assessment. The fourth and final section concludes.

4.1 Description of the programme, sample and data

REPAS is designed to shelter training provided to jobseekers registered at COLSAF. COLSAF is the only public employment service agency in Slovakia, also administrating the distribution of social contributions. Being registered at COLSAF is a precondition for applying for insurance benefit. This is the only explicit eligibility criterion applied. No further restrictions in terms of length of previous unemployment, age or other characteristics are applied. There are also no explicit limitations regarding the thematic focus, nor the length of the provided training.

REPAS quickly became an important element of employment and career counselling provided by COLSAF case officers. In the first step, jobseekers visit one of the 46 regional COLSAF labour offices (LO) to submit an application to be registered as a jobseeker. The dominant part of their characteristics is collected at this moment (from the application form). Subsequently, jobseekers are obliged to report on their job-searching efforts, which is usually done through monthly personal visits to the LO-based case officers. During these visits, jobseekers can consult and submit a Requalification Request. This can either arise from the jobseekers' own initiative[55] or can be suggested by the case officers, respectively specialised employment or career counsellors, where case officers might refer their clients[56].

Requalification Requests are evaluated by the LO based on the selected topic of the requested training, the client's claimed employment prospects resulting from the requalification and the client's past participation in COLSAF-provided training. The number of supported requests is limited by the LO budget allocated for REPAS at the time of application.

[55] There is no hard evidence on how many of the REPAS participations resulted from self-selection.

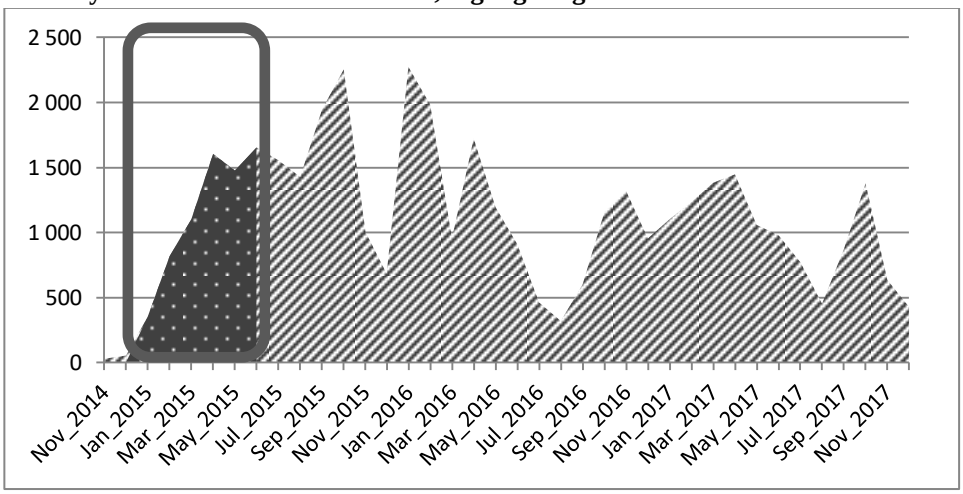
[56] No systematic client profiling with subsequent referrals to employment/career counsellors is in practice. The practice differs between LOs as well as case officers.

4.1.1 Data and the sample

To evaluate the impact of REPAS, we processed administrative data provided by COLSAF, with additional information on the employment status and income available based on the social insurance database[57]. This means that we observed the total population of participants as well as eligible non-participants.

Implementation of REPAS started in November 2014, but enrolment remained low until the end of 2014 and then increased from the start of 2015. A total of 7 105 participants entered during the first 6 months of 2015. This inflow cohort was selected as our sample of interest because of: i) its sufficient size; ii) the length of the post-participation observation period; and iii) the relative homogeneity in the implementation rules.

Figure 4.1:
Monthly numbers of REPAS entrants, highlighting the evaluated inflow cohort



Source: Author's calculations using the COLSAF database

In line with good practice for evaluating labour market outcomes of training participants, we restrict our sample (of both participants and eligible non-participants) to the middle age group of 20 to 55 years old. We also further limit our attention to jobseekers without a health disability. The group of participants was further cleaned out in five subsequent steps described in Table 4.2.

[57] Registering on the social insurance database is mandatory for all employees in Slovakia. The database only partially covers the self-employed population and does not cover those in informal employment.

Table 4.2:
Cleaning the sample of participants

Step no.	Cleaning step	Before	After	% of dropped observations
1.	Dropping multiple REPAS participations	7 105	7 007	1.38
2.	Merging the table of participants with the table of registered unemployment spells Dropping participations without an unemployment spell	7 007	6 529	6.82
3.	Dropping unemployment spells of multiple REPAS participants	6 529	6 457	1.39
4.	Dropping other unemployment spells of REPAS participants, in which participation did not occur	6 457	6 438	0.29
5.	Dropping REPAS participants with other ALMPs participation (history or future: 2013–2017)	6 438	4 832	24.95

As a result of the cleaning, we were left with 4 832 participants: i) aged 20–55 years; ii) who had participated in REPAS once between January and June 2015; and iii) who were not participating in any other ALMP.

The group of eligible non-participants consists of all individuals registered as jobseekers by COLSAF for at least one day between the beginning of January 2015 and the end of June 2015. In total, this amounts to 455 628 unemployment spells of 438 531 registered jobseekers. After removing jobseekers who were participating in other ALMPs, there were 344 694 jobseekers in the group of eligible non-participants.

Table 4.3:
Cleaning the sample of eligible non-participants

Step no.	Cleaning step	Before	After	% of dropped observations
1.	Dropping jobseekers with other ALMPs participation (history or future: 2013–2017)	438 531	344 694	21.40

We apply a rather strict cleaning rule, by dropping all the observations with participations in ALMP measures (other than REPAS) during a rather long observation period (January 2013 to December 2017). Applying this cleaning rule drops almost 25 percent of participants and over 21 percent of eligible non-participants. It can be applied, without any significant bias to our results, because of the sufficiently large sample size and the low overall accessibility of ALMP measures in Slovakia.

Table 4.4:
Means and proportions of selected observed characteristics of participants and eligible non-participants (before and after matching)

Variable		Participants	Eligible non-participants	
			Before matching	After matching
Date of registration		6.12.2013	5.8.2013	4.12.2013
Length of the unemployment spell		741.4	884.2	744.9
Age (years)		37.2	35.8	37.07
Male		39.85%	52.95%	40.98%
Education level	Primary	9.99%	19.82%	9.92%
	Lower secondary	29.03%	31.21%	28.42%
	Upper secondary	45.30%	34.53%	45.78%
	Tertiary	15.68%	14.45%	15.88%
Roma nationality		0.14%	0.33%	0.12%
Branch of economic activity of previous job	Agriculture	1.27%	1.72%	1.23%
	Manufacturing	14.13%	11.53%	14.09%
	Construction	3.20%	4.99%	3.20%
	Services	30.25%	27.62%	29.85%
	No previous employment	51.15%	54.15%	51.63%
Occupation in previous job	No previous employment	20.14%	28.50%	20.14%
	ISCO 1	1.98%	1.57%	1.74%
	ISCO 2	4.47%	3.26%	4.79%
	ISCO 3	7.53%	6.22%	7.63%
	ISCO 4	9.67%	5.63%	9.20%
	ISCO 5	15.31%	13.18%	15.68%
	ISCO 6	0.44%	1.07%	0.43%
	ISCO 7	10.70%	11.92%	10.74%
	ISCO 8	12.29%	9.36%	12.16%
Children in the household		14.30%	13.02%	14.37%
Skills	Handles a PC	64.25%	52.25%	64.60%
	Driving license	63.84%	54.51%	64.59%
	Foreign language	81.88%	73.09%	82.42%
Regional unemployment rate		16.90%	16.38%	17.05%
Income – January 2013		220	157.5	209.10
Income – June 2013		222.8	169.4	221.30
Income – January 2014		207.5	153.7	196.32
Income – June 2014		198.5	155.5	188.86
Income – December 2014		211	120.4	171.45
Employed – January 2013		49.68%	38.44%	49.41%
Employed – June 2013		50.67%	41.05%	50.72%
Employed – January 2014		46.78%	37.76%	46.21%
Employed – June 2014		47.03%	40.40%	46.95%
Employed – December 2014		34.25%	32.15%	34.42%
Number of observations		4 344	350 112	41 370

Source: Author's calculations using the COLSAF database.

The differences between participants and the eligible non-participants are detailed in Table 4.4 Generally, participants do not differ substantially from the eligible non-participants, but there are some characteristics that show significant differences. For example, upper-secondary educated females are overrepresented among the participants.

The right-hand column of Table 4.4 shows how the differences between participants and eligible non-participants balance after the propensity score matching procedure is applied. Its application is described in the following section.

4.2 Identification strategy

To identify the impact of participation in REPAS, we estimate the average treatment effects on the treated (ATT) using comparisons of observed participants' outcomes to not observed outcomes of the counterfactual situation when participants would not participate in the programme.

ATT is the difference in average outcomes of participants if they had participated ($E(Y^1|D=1)$) and the outcomes of participants if they had not participated in the programme ($E(Y^0|D=1)$). ATT can be formalised as follows:

$$\Delta ATT = E(\Delta|D=1) = E(Y^1|D=1) - E(Y^0|D=1) \qquad (1)$$

Where D is the treatment assignment (0,1) and Y is the observed outcome after participation, indexed as 0 or 1 based on the participation status.

Ideally, we would impute the missing information on the outcome in the counterfactual situation ($E(Y^0|D=1)$) based on the information observed in a randomised trial where participants and non-participants are assigned randomly. Because no randomised trial was organised in our context, we have to rely on the information observed for comparable eligible non-participants ($E(Y^0|D=0)$).

To deal with the problem of non-random selection into REPAS and the resulting differences between participants and the group of eligible non-participants, we rely on the so-called Rubin causal model, employing a quasi-experimental setting for observational data. Rosenbaum and Rubin (1983) claim that after assuring a balance between the groups of participants and non-participants, the treatment assignment is strongly ignorable. In later literature, this claim was reformulated into the so-called unconfoundedness assumption. This assumption is also called the selection on observables assumption. It basically claims that when evaluating post-treatment outcomes the treatment assignment is ignorable, once the observable characteristics of the treated and non-treated controls are balanced. In line with Rosenbaum and Rubin (1983), we

achieved balance in the observable characteristics by using the propensity score matching technique (PSM).

Additionally, when looking for non-participants that are similar to participants in terms of observable characteristics, an overlap between the two groups is necessary. The second assumption related to PSM is, therefore, called the assumption of common support[58].

PSM is usually performed in two steps. First, we estimate the propensity score using a probit model to predict the propensity to participate in REPAS.

$$\Pr(D = 1|X_{1\ldots n}) = \beta_0 + \beta_{1\ldots n}X_{1\ldots n} + \mu \qquad (2)$$

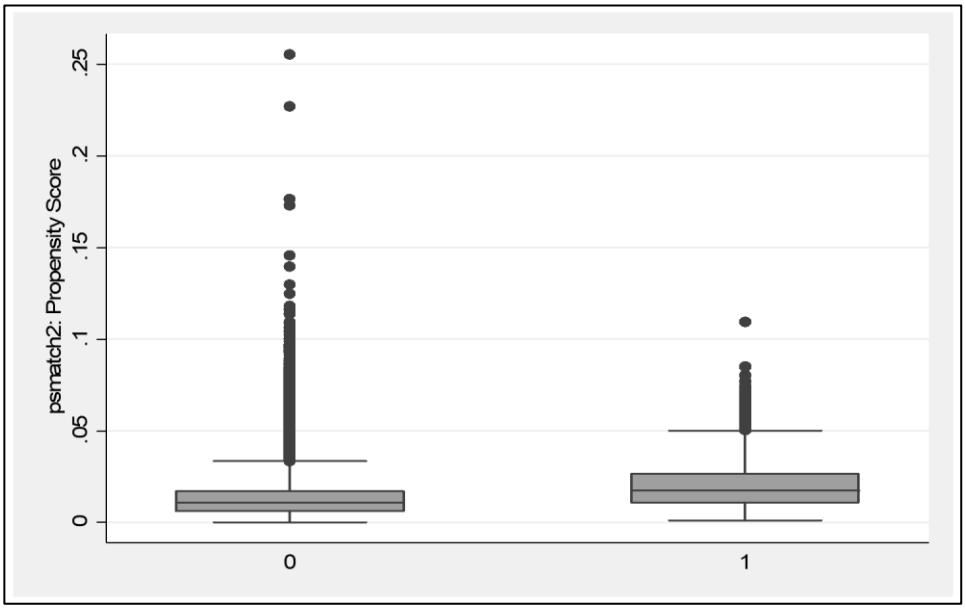
Where D is the treatment assignment (0,1) and X is the vector of n observed covariates.

In estimating the propensity score, we use the following list of covariates (X): gender, age, educational level and field, nationality, marital status, household structure, region, regional unemployment rate, start of unemployment, self-reported skills (computer, language, driving licence), occupation and economic sector of previous employment, and past outcomes (employment and income).

The propensity score is the probability of participating in REPAS, estimated based on the observed characteristics of jobseekers in the database. The distribution of the propensity score variable for participants and eligible non-participants (before matching) is displayed in Figure 4.2. An overlap in the distributions of the propensity scores between participants and the eligible non-participants (before matching) documents that the common support assumption was not violated.

[58] For more details on the assumptions of the technique see, for example, Caliendo and Hujer, 2005.

Figure 4.2:
Distribution of the propensity score variable, by participation status

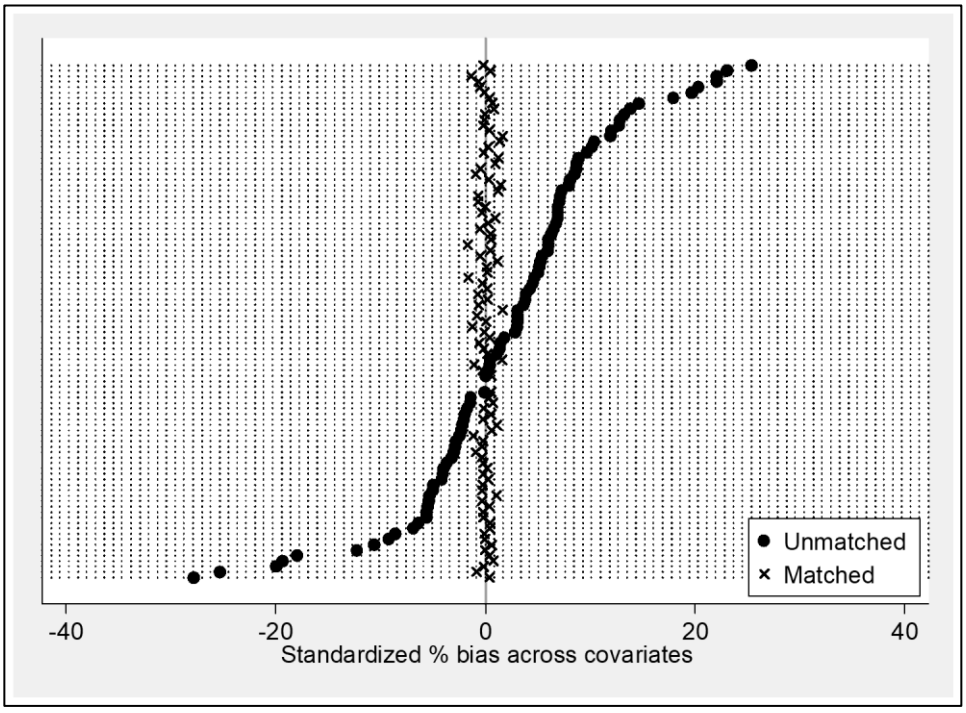


Source: Author's calculations using the COLSAF database.

In the second step, participants are matched to similar, eligible non-participants, as the estimated propensity score is used in selecting the control group. For each participant, up to 10 observations of eligible non-participants are selected from its nearest neighbours in terms of the propensity score. To comply with the common support assumption, a rather strict calliper[59] was used to drop observations of participants without any near-enough neighbours. A total of 24 observations of participants were dropped because of not having any near-enough neighbours. Weights based on the distance from the participant are used in computing the average outcome of the control group. Following these steps achieved a satisfactory balance. The standardised balance of covariates before and after matching is presented in Figure 4.3 and the mean values of the control group after matching can be found in Table 4.4 (right-hand column). A satisfactory level of balance provides support for the reasonability of the unconfoundedness assumption.

[59] Caliper of 0.00001 in terms of the propensity score variable.

Figure 4.3:
Achieved balance on covariates



Source: Author's calculations using the COLSAF database.

4.3 Estimation results

After applying the PSM described in the previous section to our sample, we follow the outcomes of interest to estimate the average treatment effects on RE-PAS participants.

4.3.1 Definition of outcomes

Our attention in this work is restricted to two outcomes of interest, employment and income. Income is measured based on the records in the social insurance company database, where the gross monthly wage is available on a monthly basis. To measure employment, two alternative indicators are used.

First, we define employment as being registered in the social insurance database, which is obligatory for all formal employees in Slovakia. The disadvantage of this indicator is that it covers self-employment only partially; informal employment and employment outside of Slovakia are not covered at all. This indicator is referred to as SI-employment.

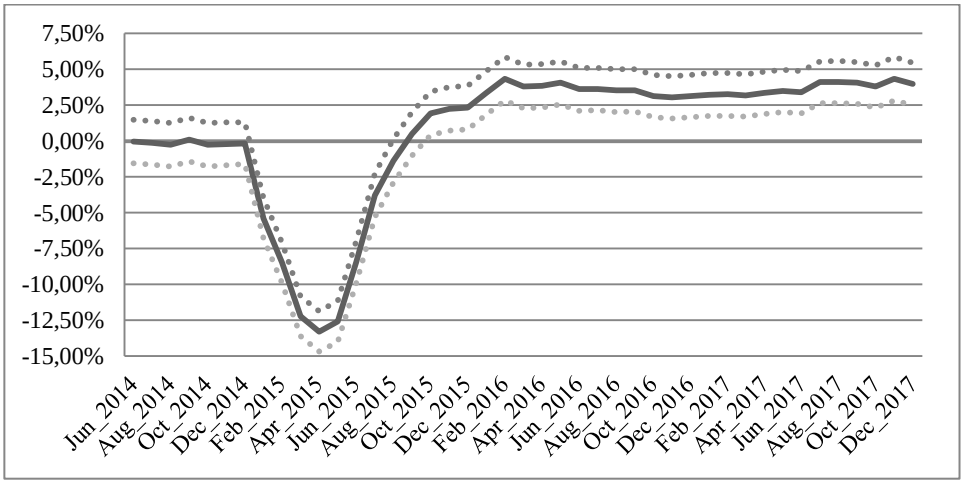
Alternatively, employment is defined as not being registered as a jobseeker at COLSAF. Defining the indicator in this way considers both self-employment and employment abroad as being employed. On the other hand, it does not distinguish if someone remains out of the labour market and unregistered as a jobseeker for all other possible reasons. It also does not fully cover employment in the informal sector, as there is quite rich anecdotal evidence on jobseekers registered at COLSAF simultaneously working in the informal sector. In the subsequent text, this outcome indicator is referred to as PES-employment.

Because we focus on a rather narrow cohort of REPAS participants, we measure outcomes in calendar time instead of relative time elapsed since the end of participation.

4.3.2 Average treatment effects on the treated

First we report the ATT for the whole evaluated cohort of REPAS participants. Figure 4.4 shows the ATTs for SI-employment, constructed based on the information from the social insurance database. It can be seen that individuals are well balanced on the history of this outcome variable during the pre-participation period (until the end of 2014). During the period of participation (January to June 2015), strong negative ATTs are estimated as the group of participants is, by definition, not employed during the participation. Afterwards, a short lock-in effect is present, until October 2015. Finally, the ATTs grow to values that are clearly positive and statistically significantly different from zero. The magnitude of the ATTs remains more or less flat during the whole post-participation period until the end of 2017. Estimated ATTs range between three to four percentage points in terms of the employment rate.

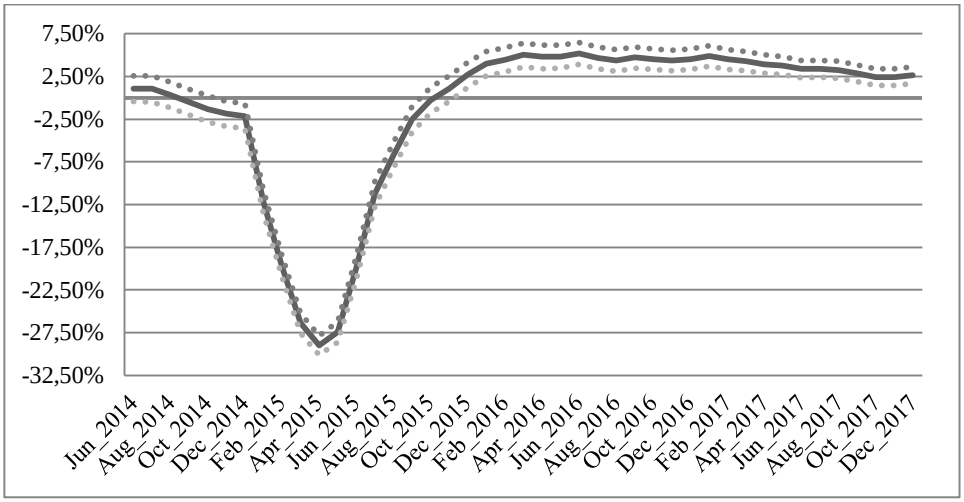
Figure 4.4:
The development of ATTs on SI-employment in time (with 95%CI)



Source: Author's calculations using the COLSAF database.

Looking at the alternative employment indicator, based on the information about being a jobseeker registered by COLSAF, shows essentially the same pattern. The main difference is that the estimated ATTs are slightly higher in the early part of the post-participation period (peak at 5.2 p.p.), and then later drop below 3 p.p. after August 2017.

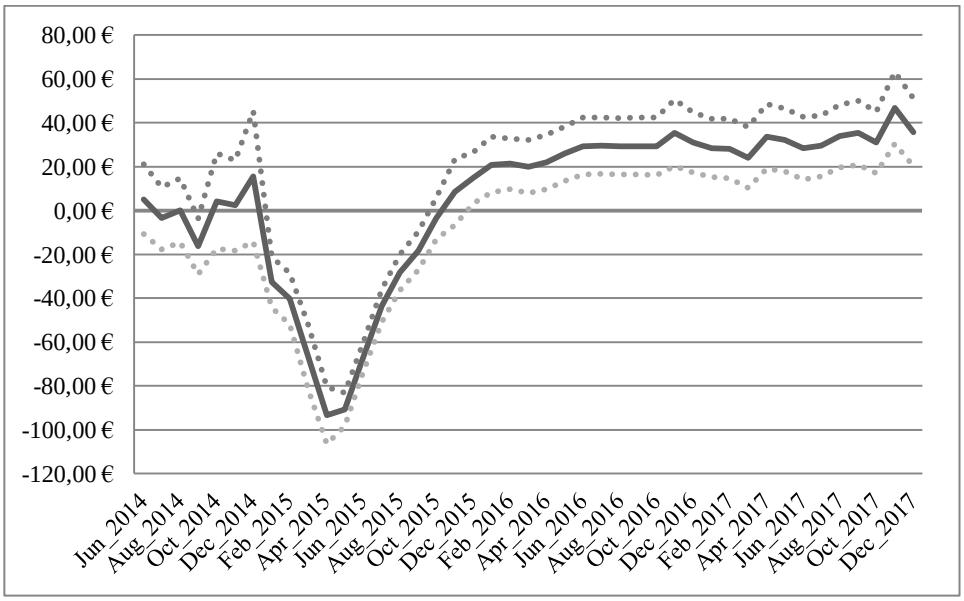
Figure 4.5:
The development of ATTs on PES-employment in time (with 95% CI)



Source: Author's calculations using the COLSAF database.

Participation in REPAS seems to also be linked with a clearly observable wage premium, which is statistically significantly different from zero. This starts at approximately 20 euro in January 2016 and further grows to 35 euro at the end of the observation period in December 2017.

Figure 4.6:
The development of ATTs on income in time (with 95% CI)



Source: Author's calculations using the COLSAF database.

A clearly observable wage premium suggests that, thanks to REPAS, participants gain additional skills that are utilised in the new job, resulting in a higher wage.

4.3.3 Heterogeneity of results

The average effects presented in the previous section tell the story of REPAS being a relatively successful training programme. The positive effects are clearly observable and statistically significant, but rather moderate in term of magnitude. Diving deeper into the heterogeneity of the estimated ATTs reveals interesting findings. The heterogeneity is substantially driven by the thematic focus of the various training activities covered under REPAS. Table 4.5 shows the ATTs estimated for June 2017 disaggregated by the thematic focus of the training. Combining the evidence acquired using the two alternative employment indica-

tors shows the heterogeneous picture of the post-participation behaviour of REPAS participants.

Table 4.5:
Results for REPAS training by thematic focus

Thematic focus of the training	Number of observations in the sample	% of the total sample	ATT in June 2017 Income		
			SI-employment	PES-employment	Income in euro
Long-term care services	1691	35.0%	0.0048 (0.36)	0.0747 (6.20)	-2.9 (-0.32)
Welding	338	7.0%	0.0229 (0.78)	0.0424 (2.69)	19.69 (0.75)
Driving license	268	5.5%	0.092 (1.70)	0.0239 (1.30)	47.68 (1.70)
Private security services	231	4.8%	0.2149 (6.47)	0.0516 (2.20)	126.64 (4.07)
Beauty services	152	3.1%	-0.2299 (-5.28)	0.0242 (0.95)	-190.68 (-6.36)
Forklift operation	149	3.1%	0.1090 (2.55)	0.0524 (2.20)	100.23 (2.50)
Total	4832	100.0%	0.0339 (4.49)	0.0337 (6.52)	28.44 (3.85)

Note: t-statistics in parenthesis; ATTs estimated in June 2017; employment in percentage points/100 and income in euro.
Source: Author's calculations using the COLSAF database.

Training in the field of long-term care services represented the largest group in our sample (35 percent). For participants in this type of training, we observed essentially no employment effect when considering the registration in the social insurance database, but a clear and statistically significant, positive employment effect when considering the un-registration from the COLSAF register of jobseekers. This suggests that the social insurance database is not grasping the effect of the training. The main reason could be that participants, after receiving this type of training, do not end up in employment in Slovakia. Rich anecdotal evidence, together with case studies (Bahna and Sekulová 2019) on Slovak carers leaving for short-term employment commitments in Austria supports this explanation.

Welding training participants present a similar story. The absence of a statistically significant ATT on SI-employment combined with a statistically significant PES-employment ATT might be driven by employment taking place outside

of Slovakia, or in the form of self-employment, which is only partially covered by the social insurance database.

Providing driving licence training under REPAS is linked with only marginal positive employment effects. In the meantime, COLSAF abolished the provision of this type of training under REPAS. Private security services training, together with forklift operation training, seem to be the best options out of the six most popular thematic types of training.

Training in beauty services revealed the most interesting pattern. A statistically significant and negative SI-employment effect shows that after receiving this type of training participants have reduced chances of gaining formal employment in Slovakia. At the same time, this is not reflected in a lowered chance of leaving the COLSAF register. Such a pattern could be explained by the transition of these participants into the informal sector. In cases when participants in beauty service training would perform these services informally at home, it would prevent them from finding a regular job in the formal sector in Slovakia, whilst at the same time they could remain among the jobseekers registered by COLSAF. Such behaviour could explain both a negative effect on SI-employment as well the absence of such an effect on the PES-employment indicator.

4.3.4 Cost–benefit assessment

Let us imagine a scenario with 1 000 participants. Their average income, if they do not participate in REPAS, would be 562 euro. If they did participate, their income would be 690.44 euro. For setting up the cost–benefit scenario, we used the ATTs estimated for June 2017, the employment effect of 3.4 percentage points and the income effect of 28.44 euro. For simplification, we identified two types of benefits from the perspective of the public budget:

I. The benefit from additional employment is the difference between the social contributions and income tax paid out of the income[60] of those additionally employed (34 out of the 1 000) to zero. (Their counterfactual income being zero, leading to zero social contributions and income tax.)
II. The benefit from their additional income would be the social contributions and income tax collected from the additional income of all the 1 000 participants.

The benefit from additional income is more than twice the benefit from additional employment. Each of the 1 000 participants earns on average 28.44 euro

[60] At the level of the average income of REPAS participants.

more. On a monthly basis, this leads to an additional income of the public budget of 3 790[61]euro from the social contributions plus 4 680 euro from the income tax. In comparison, the benefit from the REPAS-additionally generated employment is only 3 219 euro.

Table 4.6:
Comparison of direct costs and benefits of REPAS, per 1000 participants

	Benefit from additional income		Benefit from additional employment	Total
	Social contributions	Income tax		
Monthly	3 790	4 680	3 219	11 689
Yearly	45 480	56 160	38 631	140 271
Costs				373 927

Source: Author's calculations using the COLSAF database.

Based on the administrative data, the average costs per participant were 373.927 euro, leading to a total cost of 373 927 euro per 1000 participants. In such a scenario, assuming constant employment and income effects of REPAS, this publically funded investment would be returned to the state budget within 3 years.

4.4 Conclusions

The introduction of REPAS was clearly an important push to ALMP-supported training provided to registered jobseekers in Slovakia right after its launch at the end of 2014. This is mostly because ALMP training provision before 2014 was suffering from severe implementation problems, resulting in minimisation of the provision during 2011–2013. The first benefit of REPAS is simply it substantial contribution to the increase in the availability of publically financed training provided under ALMPs to registered jobseekers in Slovakia.

PSM was applied to evaluate the net impact of participation in REPAS on the employment and income of participants. Our results revealed a positive and statistically significant effect on the employment and income of participants during the post-participation period. The magnitude of the estimated employment effect is rather small but the income effect is more pronounced and thus more economically significant. Examples of training programmes with clear positive average effects on employment and income are not as common in international practice (Card et al. 2015).

[61] 3.79 euro is the additional social contribution paid from additional income of 28.44 euro, caused by REPAS.

Although, on average, REPAS seems to have a positive impact on post-participation employment and income, the heterogeneity of the impact paints some interesting stories. Here, we explored the heterogeneity determined by the topic of the provided training. As in the case of any client-selected training, some of the specialisations do not necessarily behave completely in line with the public interest. For example, when jobseekers trained in long-term care services leave the country to deliver their services abroad. Such examples show the need for detailed evidence, which is necessary to design and set up the implementation rules to further improve the efficiency of the programme.

In terms of the cost–benefit assessment, REPAS fares rather well. If accounting only for the employment effect, REPAS would not stand out from the peloton of other ALMPs in Slovakia. However, after accounting for its effect on the income of participants, which is more economically significant, REPAS would be one of the top choices in terms of value for money. This result, together with its wide applicability, makes REPAS one of the best innovations introduced by COLSAF since its establishment in 2004.

5 DISABILITY AND THE LABOUR MARKET IN SLOVAKIA

Zuzana Polačková

5.1 Introduction

By ratifying the UN Convention on the Rights of Persons with Disabilities, from the year 2010, the Slovak Republic has pledged to guarantee the right to work to persons with disabilities on an equal basis with others, the right to earn a living through freely-chosen work or work accepted in the labour market and the right to a work environment that is open, inclusive and accessible for persons with disabilities[62].

The employment of people with disabilities (PwD) in the Slovak Republic on a general level is regulated by Act No. 311/2001 Coll. Labour Code, as amended[63], which, as the highest legal norm regulating employment relationships, explicitly prohibits discrimination towards employees, among other reasons, because of their health or disability.

The Labour Code also guarantees employees with disabilities a higher level of protection during any termination of employment, as an employee with disabilities can have their work terminated by the employer only with prior consent of the corresponding regional Office of Labour, Social Affairs and Family. Otherwise, the termination is invalid[64].

Slovak legislation does not limit the concurrent payment of disability pensions and income from a professional or trade activity, regardless of whether it is income received from an employer or from self-employment. This means that the amount of disability pension is not affected by other income and PwD, who are recipients of disability pensions, may combine their income freely.

In the case of employees with disability and self-employed persons with disability, a reduced rate of 50% on the fee for Mandatory Health Insurance is applied; i.e. from the current 14% to 7% of the assessment base[65].

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[62]Memorandum of The Ministry of Foreign Affairs of the Slovak Republic No. 317/2010 Coll. - The Convention on the Rights of Persons with Disabilities

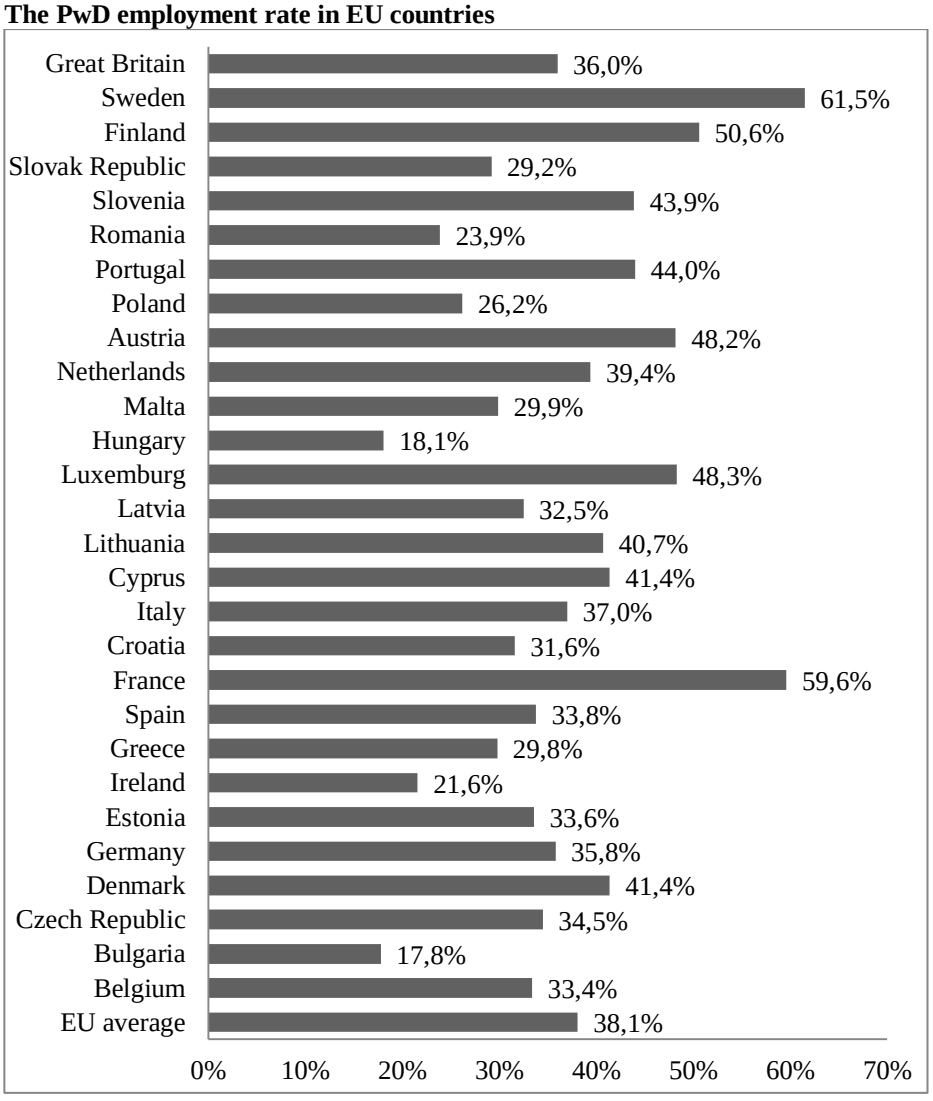
[63] See §158 and 159 of Labour Code

[64] See § 66 of Labour Code

[65] See Act No 580/2004 Coll. on health insurance and the amendment of Act No. 95/2002 Coll. on insurance and on amendments and supplements to certain law

Another tool, which should support the entry and remaining of people with disabilities in the labour market, is utilising the compulsory rate of employees with disabilities. An employer who hires at least 20 employees is obliged to employ PwD for the number that represents 3.2% of the total amount of workers. In case the employer does not fulfil the obligation, which can also be filled by the so-called replacement implementation, by awarding a contract suitable for the employment of PwD in a sheltered workshop or sheltered workplace, the employer is obliged to pay a levy for non-compliance.

Figure 5.1:
The PwD employment rate in EU countries



Source: Eurostat

Active labour market measures that are implemented within the scope of the Act 5/2004 on employment services, where a spectrum of measures explicitly and exclusively targeted at PwD is defined, also aim at supporting the entry and remaining of PwD on the market. Their scope, as referred to in the act, is comparable with the standard of the EU member countries.

Despite the presence of a standard range of actions and instruments aimed at promoting PwD in the labour market implemented in Slovakia and listed above, in comparison with other EU countries, the employment of people with disability in Slovakia remains low (see Figure 5.1).

5.2 The quantification of the PwD group

The fragmentation of disability assessment and support mechanisms, leading to the fragmentation of the whole view of the size and needs of PwD in the area of employment, among others, remains a long-term challenge for better planning and execution of measures aimed to support employment of PwD in Slovakia.

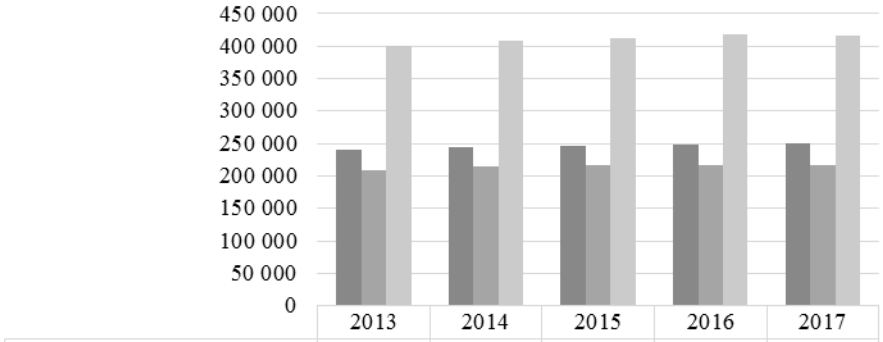
The problem lies especially in the two methods of assessment. In the context of PwD, the Slovak system makes a distinction between the categories of 'severe health disability' and 'disability'. Their evaluation is carried out by two different institutions under two different laws and the entire system is not connected.

Disability and the extent of disability are subject to social insurance and are dealt with by the Act 461/2003 Coll. on Social Insurance as amended. Assessment of disability is a condition for the granting and payment of the disability pension. The Social Insurance Agency Institution is responsible for such assessments.

Assessment of 'severe health disability' is carried out within the meaning of the Act 447/2008 Coll. on Financial Allowances for compensation of severe disability and on amendments to certain laws. Its performance is entrusted to offices of labour, social affairs and family. A person considered to have a severe health disability, under the Act, has the right to apply for a disabled person ID and additional payments or compensation devices intended for people with severe health disabilities.

Despite the fact that both legal standards are closely linked and, to a large extent, reach out to the same group of people, two separate processes are created based on them. Therefore, it is possible that someone who is considered a person with a severe health disability is not a beneficiary of a disability pension and vice versa.

Figure 5.2:
Number of individuals with disabilities assessed according to the individual legal standards

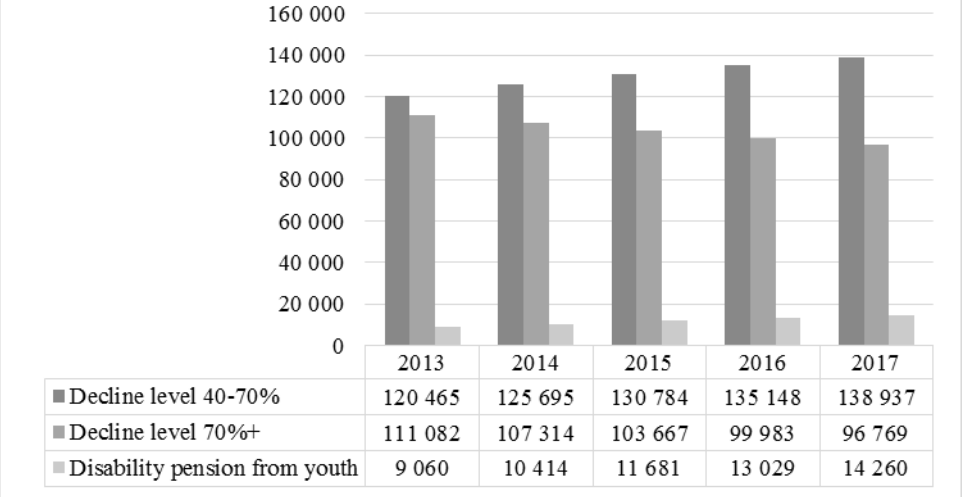


	2013	2014	2015	2016	2017
The number of recipients of disability pension (assessment by Social Insurance Agency)	240 607	243 423	246 132	248 160	249 966
The number of persons assessed as persons with a severe health disability ages 15-64 (assessment by Office of Labour)	208 230	213 737	216 409	217 419	215 874
Total number of persons assessed as persons with severe health disability (ages 0-XY) (assessment by Office of Labour)	399 608	408 477	412 949	417 427	417 067

A person is considered disabled when a long-term (for more than one year) adverse state of health has led to a fall of more than 40% in their ability to perform gainful activity, compared with a healthy person[66]. On the basis of the assessment of the fall in ability percentage, the person then receives an amount of pension benefits. In case the rate of decline is more than 40% but less than 70%, a person can apply for the payment of partial disability pension. If the rate of decline represents more than 70%, the person can apply for full payment of the disability pension. Assessment of disability is, among other things, a condition for participation in the active measures of the labour market exclusively intended for PwD.

[66] See § 71(1) of the Act on Social Insurance

Figure 5.3:
Number of recipients of disability pension by disability



	2013	2014	2015	2016	2017
Decline level 40-70%	120 465	125 695	130 784	135 148	138 937
Decline level 70%+	111 082	107 314	103 667	99 983	96 769
Disability pension from youth	9 060	10 414	11 681	13 029	14 260

Source: Social Insurance Agency

A person with a severe health disability (assessment conducted by the Office of Labour) is someone whose long term adverse state of health (for more than one year) or functional defect has led to a fall of more than 50% in their ability to perform employment activity. In the event that the rate of decline is assessed at less than 50%, a citizen is considered to be a person with a disability, with no compensation entitlement.

For purposes of the Act on Employment Services, which is a basic legal standard for implementing active labour market measures, a person is regarded as a person with a disability if considered disabled within application of the Act on Social Insurance. This person demonstrates a decline in their ability to perform employment activity due to physical defects, mental illness or behavioural impairment by a decision or a notice from the Social Insurance Agency. Therefore, in order to receive contributions from active labour market measures aimed at increasing employability and employment of PwD, it is not necessary to receive an assessment of the extent of functional disability from the office of labour, social affairs and the family (i.e. the institution responsible for the active labour market measures). The Social Insurance Agency decision is relevant. For the target group, this situation creates a number of irregularities and lack of understanding: voices regularly call for the unification and simplification of Slovak disability evaluation system.

This analysis concerns persons considered disabled. Thus, the rate of the decline in their abilities to perform a gainful activity, compared to a healthy person, is more than 40%. In addition to the rate of decline being the starting point for determining the amount of disability pensions, it is also crucial for determining the intensity of aid under active labour market policy, where those with a higher functional decrease are entitled to a higher rate of aid.

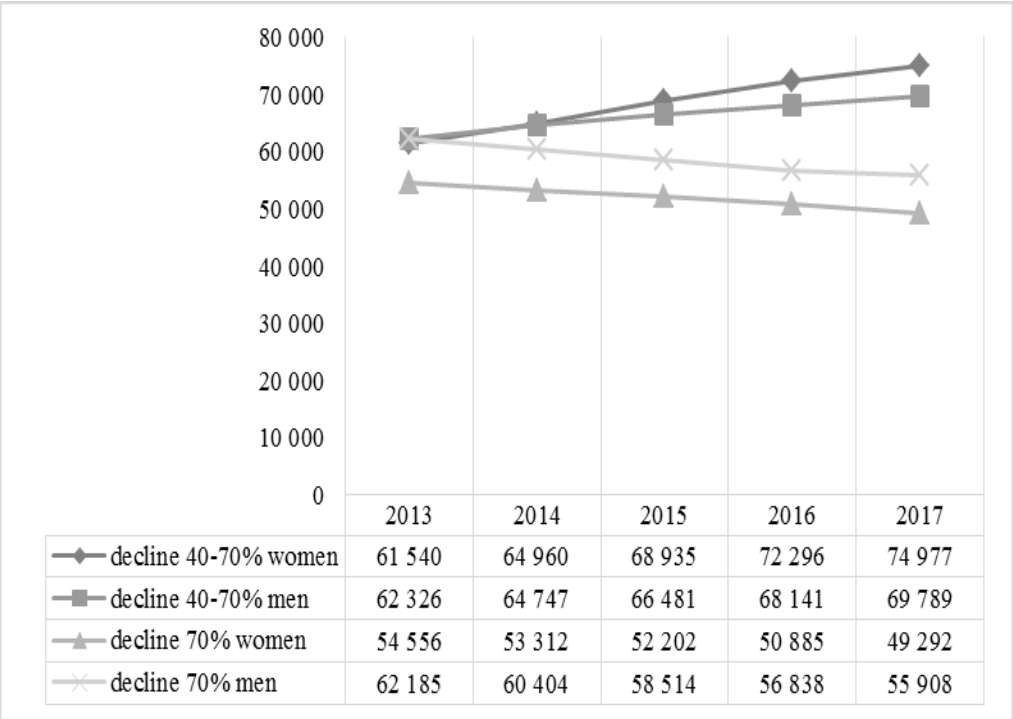
Persons with a 40-70% rate of decrease in ability to perform gainful activity – i.e. recipients of partial disability pensions - represent the largest group in comparison to the other categories. A special group of disability pension recipients is the so-called youth disability pensions. These are granted to persons who have become disabled prior to reaching the age of the end of mandatory school attendance or in the period in which they were a dependent child. Entitlement to the pension can occur at 18 years of age at the earliest. In the case of recipients of youth disability pensions, the extent to which the ability to perform gainful activity is not determined, as it is assumed that the rate of decline almost completely prevents the regular pursuit of gainful activity. The recipients of youth pensions represent approximately 4% of all the pension recipients.

The absolute number of people categorised as disabled shows an upward trend in a year-over-year comparison (from 240,607 in 2013 to 249,966 in 2017). The number of persons whose rate of decline in the ability to perform gainful activity represents more than 40% but less than 70% (the so-called partially disabled pensioners) is also increasing (from 123,866 in 2013 to 144,766 in 2017). The number of recipients of the so-called youth pensions is also increasing (from 9,060 in 2013 to 14,260 in 2017).

However, the number of persons whose rate of loss of ability to perform employment activity is assessed at 70% and more is showing a year-over-year decline (from 116,741 in 2013 to 105,200 in 2017).

There is an interesting trend between men and women of levelling the differences in the total number of persons considered disabled (see Figure 5.4). Despite the fact that more men than women are determined as disabled, the absolute number of people categorised in the breakdown by gender is disappearing (in 2013, the difference was almost 8,500 persons in favour of men. In 2017, it was only slightly more than 1,400 people in favour of men).

Figure 5.4:
Number of PwD assessed as disabled by gender and disability extent



	2013	2014	2015	2016	2017
decline 40-70% women	61 540	64 960	68 935	72 296	74 977
decline 40-70% men	62 326	64 747	66 481	68 141	69 789
decline 70% women	54 556	53 312	52 202	50 885	49 292
decline 70% men	62 185	60 404	58 514	56 838	55 908

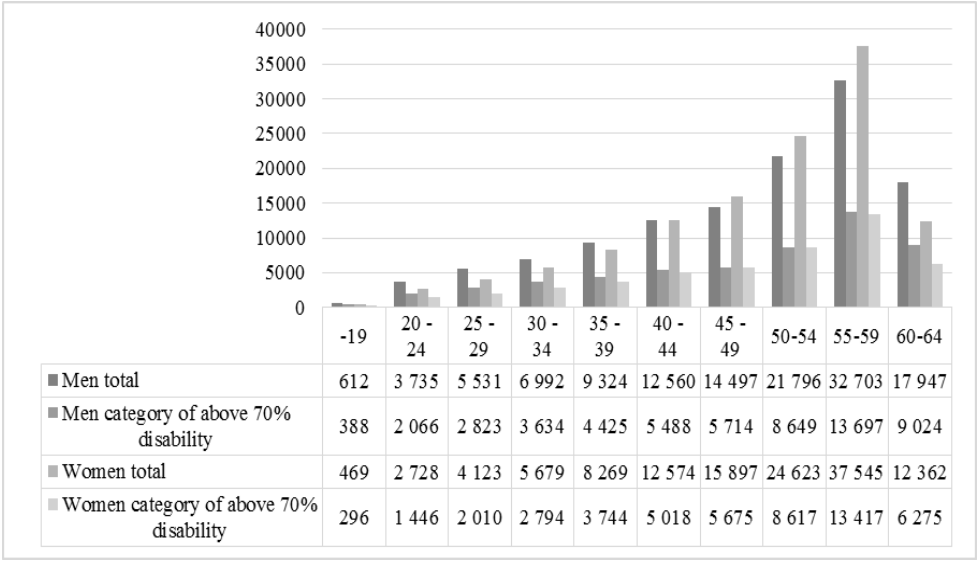
Source: Social Insurance Agency

Significant gender differences still remain in the breakdown according to the intensity of heath disability expressed as a loss to perform gainful activity. In the above 70% category, the decrease in absolute figures in year-on-year comparison is slower in the case of women than men (decline in the years 2013 and 2017 indicates 5,264 women, against 6,277 men), in relation to the category under 70%. There, the increase of the absolute number of women is significantly steeper (increasing between 2013 and 2017 to 13,437, against 7,463 men).

The largest number of persons of working age and considered as disabled is in the 55-59-year-old category (see Figures 5.5 and 5.6). This can be interpreted as a natural phenomenon, as the risk of worsening health increases with age. However, it is possible to speculate that the situation can be a reaction to the structure of the labour market in Slovakia, where the chances of successfully remaining in the labour market reduce with age. It is, therefore, possible to assume that people aged 55+ with health problems, who find themselves out of work, give up the search for employment and elect disability pension as a source of regular income. As an argument in favour of this claim, the year-over-year comparison of the number of persons in the category 60-64 years, i.e. the period

immediately before the age of retirement pension, which is the only age category with a significantly increasing trend (an increase of more than 9,000 people in the period 2013-2017), can be used. On the other hand, the development in the age category 55-59 years speaks against this speculation. In the years 2013-2017, there has been a decline of almost 3,000 persons. The stated hypothesis, however, is not examined or confirmed by any further research.

Figure 5.5:
Number of PwD by age and gender in 2017

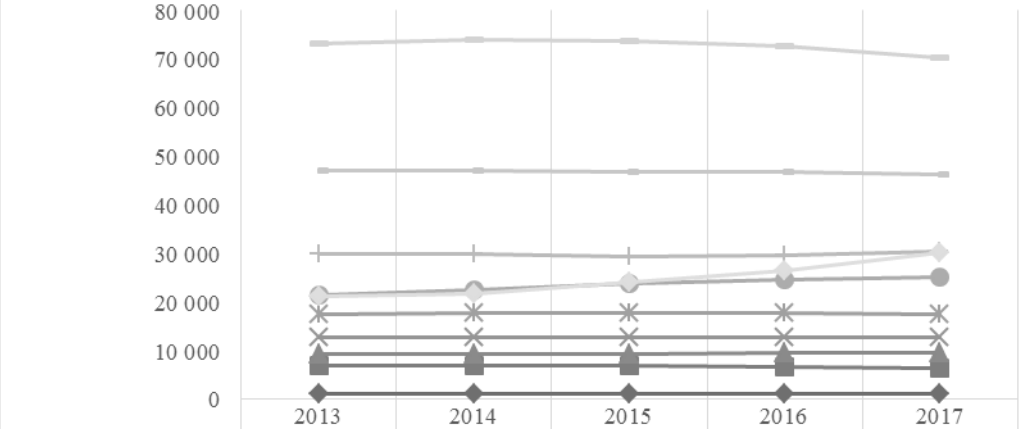


	-19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50-54	55-59	60-64
Men total	612	3 735	5 531	6 992	9 324	12 560	14 497	21 796	32 703	17 947
Men category of above 70% disability	388	2 066	2 823	3 634	4 425	5 488	5 714	8 649	13 697	9 024
Women total	469	2 728	4 123	5 679	8 269	12 574	15 897	24 623	37 545	12 362
Women category of above 70% disability	296	1 446	2 010	2 794	3 744	5 018	5 675	8 617	13 417	6 275

Source: Social Insurance Agency

In a regional breakdown of the amount of people determined as those with reduced ability to participate in gainful activity, there are significant differences. From the entire population, the percentage of those considered disabled from the ages 14-65 years ranges between 1.8% (Bratislava II) and 12.2% (Veľký Krtíš).

Figure 5.6:
Number of recipients of disability pension by age

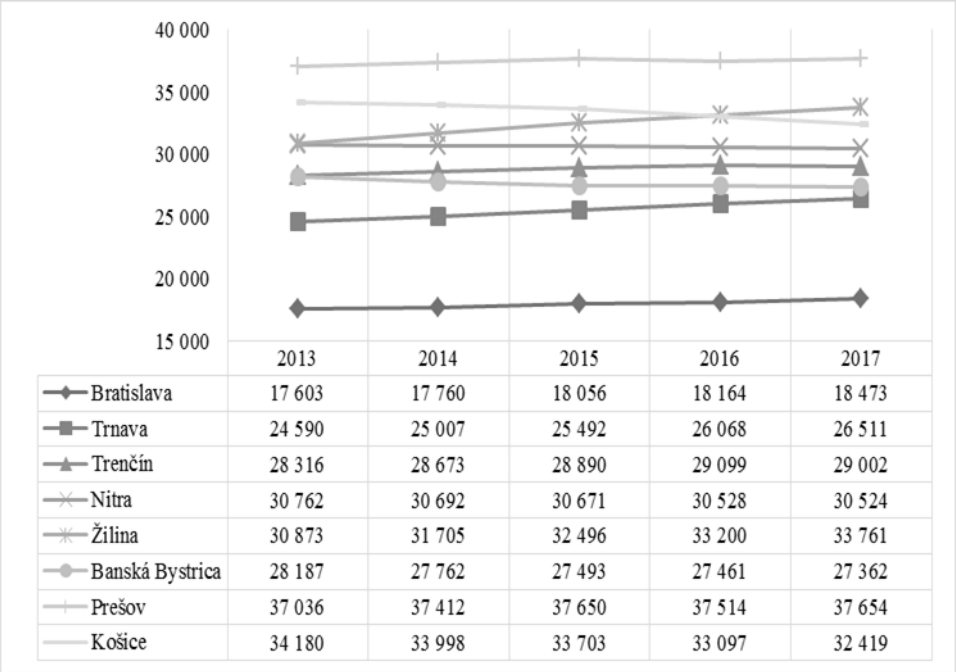


	2013	2014	2015	2016	2017
age under 19	1 165	1 164	1 151	1 143	1 081
20-24	6 967	6 960	6 848	6 681	6 463
25-29	9 371	9 315	9 344	9 462	9 654
30-34	12 636	12 690	12 828	12 758	12 671
35-39	17 517	17 854	17 889	17 791	17 593
40-44	21 435	22 562	23 723	24 632	25 134
45-49	30 005	29 837	29 449	29 637	30 394
50-54	47 148	47 217	46 894	46 844	46 419
55-59	73 150	74 146	73 796	72 767	70 248
60-64	21 213	21 678	24 210	26 445	30 309

Source: Social Insurance Agency

At the regional level, the highest increase in the number of persons determined as disabled in the year-over-year comparison can be observed in Žilina self-governing region (increase of 0.8% between 2013 and 2017). A correlation with the level of registered unemployment, which would support the hypothesis that there is an increased number of recipients of disability pension in districts with higher levels of registered unemployment, has not been confirmed. In the case of 10 districts with the highest registered unemployment, only three recipients of disability pension exceeded 8% of the total working-age population (Medzilaborce, Sobrance and Michalovce).

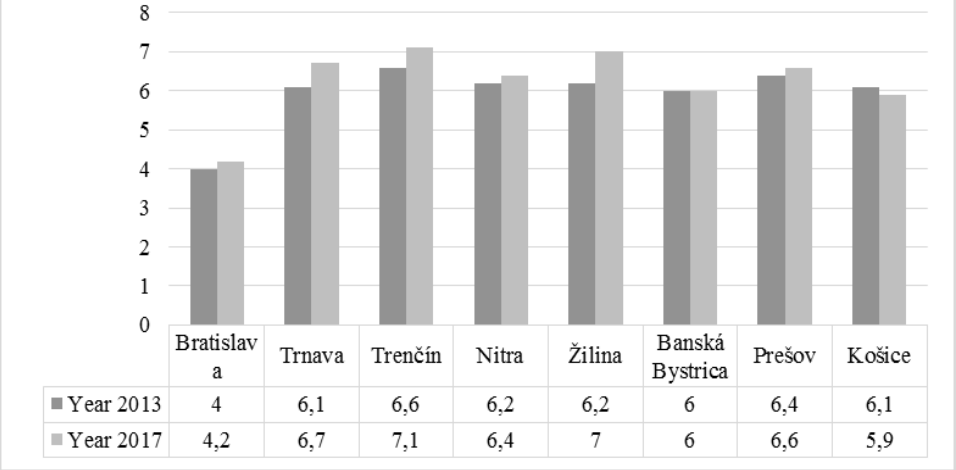
Figure 5.7:
Year-over-year development of the number of recipients of disability pension in regional breakdown



	2013	2014	2015	2016	2017
Bratislava	17 603	17 760	18 056	18 164	18 473
Trnava	24 590	25 007	25 492	26 068	26 511
Trenčín	28 316	28 673	28 890	29 099	29 002
Nitra	30 762	30 692	30 671	30 528	30 524
Žilina	30 873	31 705	32 496	33 200	33 761
Banská Bystrica	28 187	27 762	27 493	27 461	27 362
Prešov	37 036	37 412	37 650	37 514	37 654
Košice	34 180	33 998	33 703	33 097	32 419

Source: Social Insurance Agency and author's calculations

Figure 5.8:
Share of beneficiaries of disability pension in the population of working age in %



	Bratislava	Trnava	Trenčín	Nitra	Žilina	Banská Bystrica	Prešov	Košice
Year 2013	4	6,1	6,6	6,2	6,2	6	6,4	6,1
Year 2017	4,2	6,7	7,1	6,4	7	6	6,6	5,9

Source: Social Insurance Agency, Statistical Office and author's calculations

5.3 Participation of PwD in the labour market

According to the Social Insurance Agency, as of 31.12.2017, of 96,938 people determined as those with a reduced capacity to work, at least 40% (i.e. recipients of disability pension), have been contributing to the insurance system. This means that 38.7% of the total number of 249,964[67] recipients of disability pensions registered as of 31.12.2017 participated in the labour market (see Table 5.1).

Table 5.1:
Number of PwD contributing to Social Insurance Agency by type of insured person and year

Number of PwD contributing to Social Insurance Agency by type of insured person and year					
Type of insured person	**Year**				
	2013	**2014**	**2015**	**2016**	**2017**
Employee	51 863	54 779	58 913	65 093	70 790
Self-employed person	6 671	6 984	7 203	7 337	7 456
Voluntarily insured person	693	516	426	387	358
Work agreement/temp work	11 416	12 238	13 615	13 996	12 674
Concurrent employee and self-employed persons	704	775	726	750	787
Concurrent employee and voluntarily insured person	213	81	26	30	15
Concurrent employee and work agreement/temp worker	3 954	3 984	4 196	4 289	4 582
Concurrent self-employed and voluntarily insured person	143	48	18	17	11
Concurrent self-employed and work agreement/temp work	349	282	259	246	255
Concurrent voluntarily insured and work agreement/temp worker	51	27	9	12	10
Total	**76 057**	**79 714**	**85 391**	**92 157**	**96 938**
Total number of recipients of disability pension (including so-called disability pension of youth)	240 607	244 425	246 132	248 160	249 960
% Recipients of disability pension in the labour market	**31.7**	**32.6**	**34.6**	**37.1**	**38.7**

Source: Social Insurance Agency

The Social Insurance Agency also states that the participation rate of disability pension recipients in the labour market is increasing year-over-year. This can

[67] This also includes the youth pensions, 14,260 of which were being distributed, as of 31.12.2017.

certainly be viewed as a positive trend. It may be interpreted as a result of more phenomena, such as the emptying of the labour market and shortage of labour force in Slovakia. More job opportunities are provided for groups more removed from the labour market, as well as increasing the retirement age and the natural increase in disabilities among employees of greater age, for whom the prevalence of disability rises. This also applies to the increased involvement of employers (multinational corporations, in particular) and the creation of several initiatives aimed at a higher degree of integration of PwD into the labour market (e.g. the business leaders initiative called Figureer of Diversity, etc.).

Despite visibly positive trends, the level of acceptance of 'otherness' in the workplace (including disability) is still lagging in comparison with other EU countries. According to a survey on discrimination in the EU from the year 2015[68], the level of acceptance of a colleague with a health disability is the lowest in the Slovak Republic, among the entire EU. Only 47% of the respondents indicated that having a colleague with a disability is a totally comfortable situation for them (the EU average is 77%), while 9% indicated such a situation was not at all comfortable. Together with Romania and the Czech Republic, this represents the ultimate level of non-acceptance (the EU average is 3%).

A reason for these disheartening results may be high rates of worry and ignorance emanating from a lack of direct personal experience with a colleague with disabilities. According to a survey carried out by a job portal, profesia.sk, which aimed to map out actual experience with disadvantaged groups in Slovakia and map the acceptance rate of 'otherness' in Slovak workplaces, only 16% of the respondents of the total sample 2,441 persons stated that they had actual experience cooperating with a physically disabled person in their current workplace.

A reason for the persistently low PwD participation in the labour market (despite the yearly increase) can also be the lack of an inclusive education system, in which pupils/students without disability rarely come into contact with classmates with disabilities. This is in addition to pupils/students with disability rarely being encouraged to higher performance and professional ambition, which would significantly ease their entry and retention in the labour market.

A patronising attitude towards people with disabilities is still commonplace: they are perceived as people unable to fully participate in the labour market, and who should be provided for by the state through the social system. Public opinion and public debate, despite international trends, still focuses on the medical aspects of disability and highlights restrictions arising with disability, while a

[68] Eurobarometer 437, Discrimination in the EU in 2015

complex approach aimed at a bio-psycho-social perception of disability and orientation towards strength and the search for/strengthening the existing capacities of people with disabilities is still not fully accepted or established in practice.

A serious problem regarding employing PwD remains in structural PwD unemployment, when the availability of labour does not correspond to demand.

On one hand, employers often report helplessness in finding suitable staff with disabilities. Conversely, for example, at the end of 2017, portal profesia.sk, registered 2,978 job applicants with disability, actively searching for work. Candidates with their CV uploaded on the portal profesia.sk (despite no research on this subject) can be considered to be proactive and it can be assumed that their interest in finding employment is authentic. On the other hand, it is not impossible that the number of people registered on a portal Profesia.sk overlaps with PwD registered in the register of job seekers in the labour offices, standing at 6,626 as of 31.12.2017.

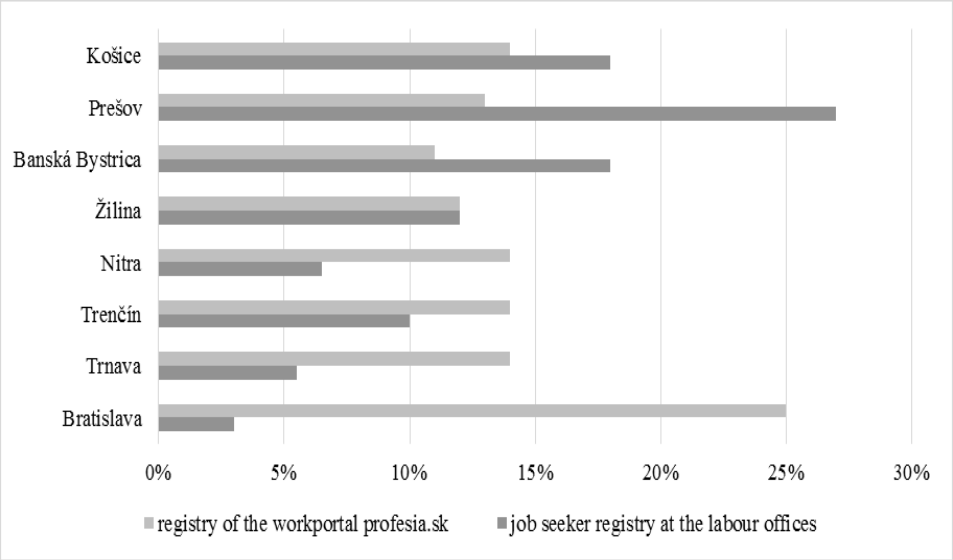
It is worth noting that in the regional distribution of people registered in each of the databases (see Figure 9), in portal profesia.sk, the largest group represented are those from the Bratislava region. 736 people (25% of the total number of registered persons) are registered, while in the catalogue of job seekers maintained by the labour office as of 31.12.2017, there were only 202 (only 3% of the total number).

This difference can be interpreted through the structure of the labour market and the options of the labour offices in the various regions, as well as by readiness to use services other than public employment.

Given the structure of the labour market, there is a relatively large amount of job vacancies and employers have higher levels of acceptance and readiness to employ PwD in the Bratislava region. Therefore, PwD often do not need to register at the labour office, as no benefits ensue from the registration. On the other hand, registration on an employment portal can bring new opportunities, including employers who do not cooperate with labour offices.

However, in the east of Slovakia, often the only opportunities for a disabled person’s employment are active labour market measures (for more information, see next chapter), where registration at the office is mandatory.

Figure 5.9:
Number of PwD registered in the various databases

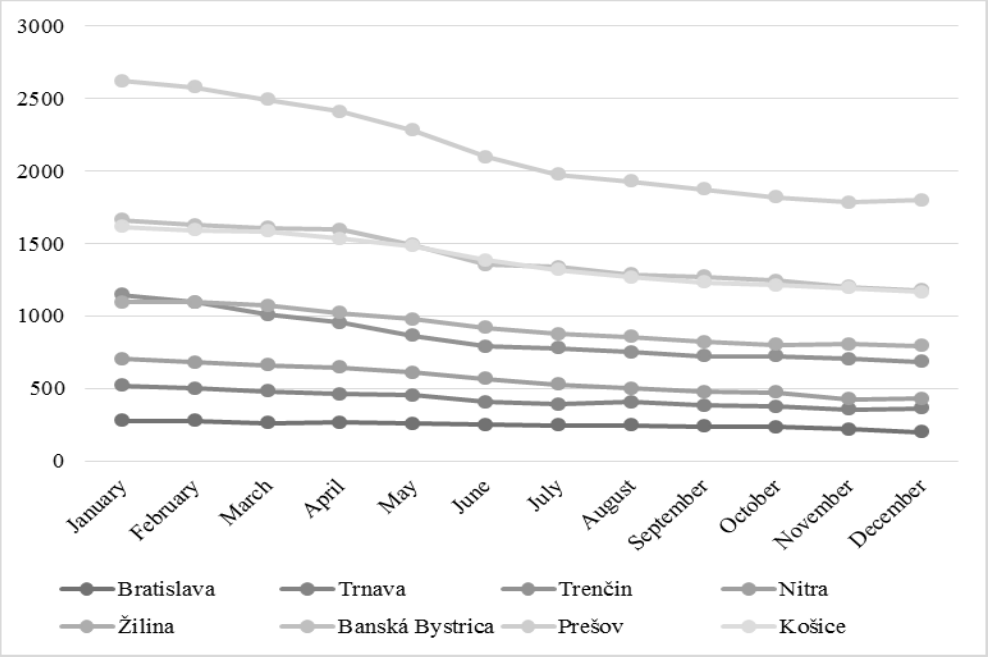


Source: Central Office of Labour, Social Affairs and Family and profesia.sk

The number of job seekers with disability, registered by the labour offices, decreased throughout 2017: it fell from 9,651 registered employment applicants with a disability (as of 31.1.2017) to 6,626 persons (as of 31.12.2017). The same trend was also monitored at a regional level (see Figure 5.10). Given the limits of the Central Office Labour, Social Affairs and Family databases, it is not possible to be certain how many people were removed from the records of job seekers over the year due to successfully finding a job.

Significant regional disparities can also be observed in the number of vacancies reported by employers at a labour office and identified as being suitable for PwD. The number of job vacancies suitable for PwD compared to the number of registered job-seekers with a disability varied between 14.8 positions per candidate (Bratislava 1) and 130 candidates per job (Košice area) or 113 candidates for a non-existent place of work (Rožňava) (see Figure 5.11).

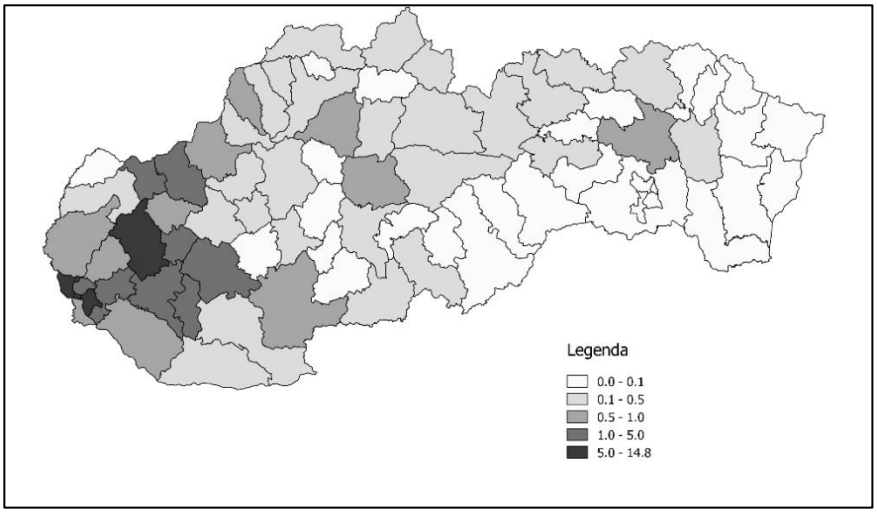
Figure 5.10:
Number of registered job seekers with disability in regional classification



Source: Central Office of Labour, Social Affairs and family and author's calculations

Figure 5.11:

Number of job vacancies registered by the labour office as appropriate for an applicant with disability per one applicant for a job with disability registered in job seekers registry



Source: Central Office of Labour, Social Affairs and Family and author's calculations

Information on the number of job vacancies registered by labour offices as suitable for PwD certainly does not provide complete information on the labour market structure in the district, as employers have no legal obligation to report vacant positions. The number of vacancies recorded by the labour office is only a fragment of the total number of jobs in the district, but there is no information about its size.

Furthermore, information on the number of registered applicants for disabled people's employment cannot be interchanged with the number of people with disabilities without a job, since a large group of PwD is not active in the labour market or registered as job applicants.

Registration at the labour office is not mandatory for a person inactive in the labour market. A strong motivation for registration in the case of persons without disability is the fact that the person registered at the labour office becomes a so-called insuree of the state in the system of public health insurance and has no financial obligations towards a health insurance company (in the case of a person not active in the labour market not being registered, compulsory payments for health insurance have to be paid by them). However, this incentive does not apply to recipients of disability pensions, as they automatically become insured by the state and, in case a person with a disability does not wish to take advantage of some of the active labour market measures, registration does not bring any benefits.

After subtracting the number of people who are receiving disability pension (249,960 as of 31.12.2017) and are registered by the Social Insurance Agency as active insured people (96,938 as of 31.12.2017) and those who are registered in the registry of job seekers (6,626 persons as of 31.12.2017), from the total number of recipients of disability pension, a group of 146,396 people remains. That represents 58% of all recipients of disability pension, who do not show activities related to the labour market.

From the point of view of reporting registered unemployment of PwD, this group of people (despite its size) does not exist and public policies related to employment do not take into consideration this group of people all.

5.4 Tools to support the employment and employability of PwD

5.4.1 Active labour market policies

The main tool of public policies aimed at increasing employment and the employability of disadvantaged groups in the labour market are certainly active labour market policies (ALMP), which are, in the Slovak Republic, defined by Act 5/2004 Coll. on employment services.

Job applicants with a health disability have the opportunity to use measures that are exclusively or explicitly intended for PwD, and furthermore, no legal standard precludes their participation in an ALMP, which is intended for any job applicant.

However, given the amount of incomplete data in the databases of the Central Office of Labour, Social Affairs and Family of the Slovak Republic, it is not possible to accurately determine participation rates of PwD in the entire ALMP portfolio (including those that are not specifically intended for PwD); it is possible, based on an expert estimate, to consider the participation to be minimal and, statistically speaking, irrelevant.

For example, in the case of measures aimed at improving employability, which are, in particular, retraining and education; i.e. in the category of ALMP in which there are no programmes specifically designed for job-seekers with health disability, out of 12,867 participants in the program REPAS, only 655 were PwD (5%). In the case of projects REPAS+, the participation rate of PwD was even lower and reached 0.09% of all participants (out of 2,145 participants, 20 were PwD). In the case of project Kompas, participation of PwD reached 1.3% of all project participants (out of 2,247 participants, 29 were persons with disabilities)[69].

Engaging the PwD in active labour market measures focuses, in practice, on the measures defined within the §56-60 of Act 5/2004 Coll. on employment services. Therefore, within the framework of measures aimed at:

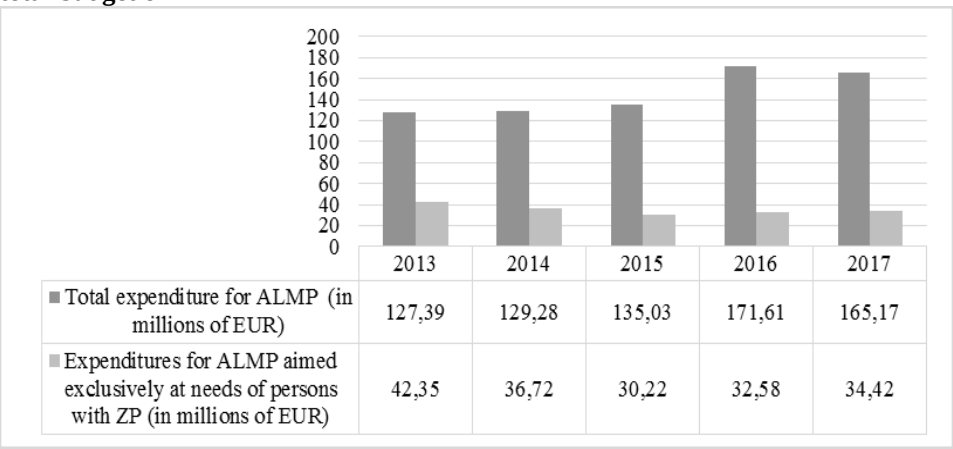
- Increasing employment, those are:
    - contribution to the establishing of a sheltered workshop and sheltered workplace (§ 56 of the Act),
    - contribution to a person with disabilities operating or engaging in self-employed activities (§ 57 of the Act),

[69] Central Office of Labour, Social Affairs and Family, 2018

- Maintaining existing jobs, those are:
    - contribution for maintaining a person with disability in employment (§ 56a of the Act),
    - contribution for a work assistant's activities (§ 59 of the Act),
    - contribution to cover sheltered workshop or sheltered workplace's operating costs and the costs of staff transportation (§60 of the Act).

Considering the expenditure structure of ALMP, it can be stated that in 2017, the expenditure intended to implement measures exclusively aimed at the needs of PwD, was almost 21% of the total budget of expenditures for ALMP. Compared with the previous two years, this is a slight increase. This comes following a period of substantial decrease from the year 2014, since in 2013, expenditure for ALPM intended exclusively for PwD represented 33.2% of the total budget, which, in nominal terms, is 42.35 million Euros (see Figure 5.12).

Figure 5. 12:
Rate of expenditure for AOTP exclusively intended for PwD in comparison with the total budget of ALMP



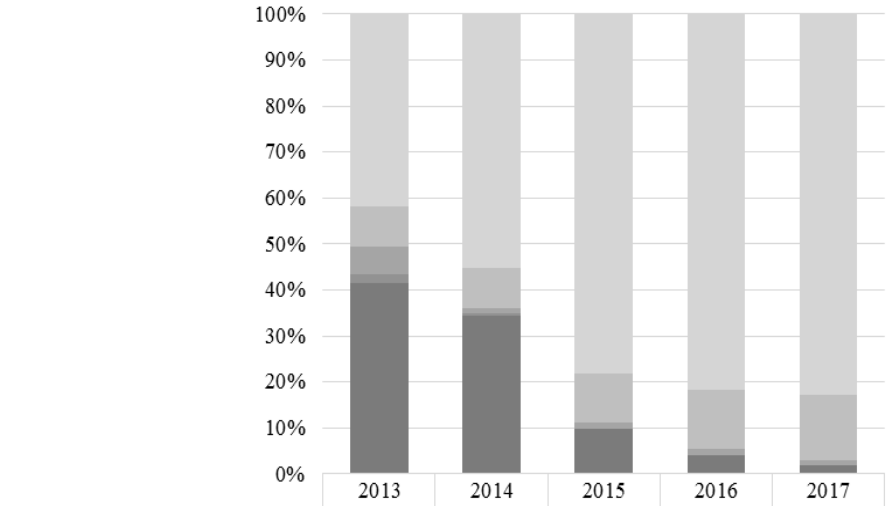
	2013	2014	2015	2016	2017
Total expenditure for ALMP (in millions of EUR)	127,39	129,28	135,03	171,61	165,17
Expenditures for ALMP aimed exclusively at needs of persons with ZP (in millions of EUR)	42,35	36,72	30,22	32,58	34,42

Source: Central Office of Labour, Social Affairs and Family and author's calculations

In the period 2013-2017, the internal structure of expenditure for ALMP intended for PwD was also changing. While in 2014, a significant component of expenditure was the contribution to set up a sheltered workshop and sheltered workplace (§ 56 of the Act), in 2015, the expenditure for this measure showed a significant drop. The majority of the expenditure is associated with the contribution to cover the operating costs of a sheltered workshop or sheltered workplace. It also covers the cost of the transportation of employees implemented within the scope of § 60 of the Code of employment services (see Figure 5.13).

Changes to the internal structure of expenditures can be considered a result of an amendment to the Act 5/2004 on employment services from 2013, within which lists of eligible expenditures implemented within the meaning of the measures were edited (e.g. in the §56, wage costs become ineligible). The duration of compulsory sustainability was also changed (e.g. in the case of §57, the compulsory sustainability of the business license has been extended for two years). In addition, access to individual measures (§56, §56a, §57 and §60) were changed from obligatory (when a contribution has to be given to everyone who filled the administrative conditions) to optional (when allocation is subject to further assessment and selection).

Figure 5. 13:
Internal structure of expenditures on selected measures of ALMP in year to year comparison

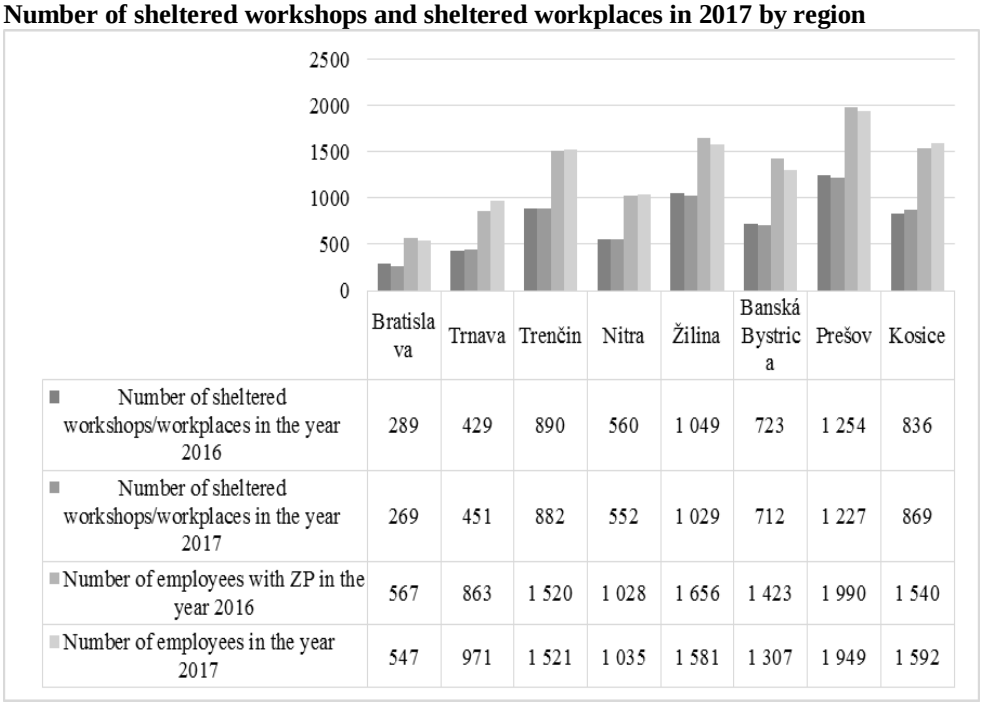


	2013	2014	2015	2016	2017
§ 60 (contribution to cover operating costs of sheltered workshop or sheltered workplace and employees´ transport costs)	17,75	20,26	23,61	26,63	28,47
§ 59 (contribution for activities of the assistant at work)	3,66	3,22	3,26	4,21	4,91
§ 57 (contribution for operating or performing self-employment to person with disability)	2,54	0,43	0,39	0,39	0,39
§ 56a (contribution for remaining of person with ZP in employ)	0,78	0,17	0,03	0,04	0,03
§ 56 (contribution for establishing sheltered workshop and sheltered workplace)	17,62	12,64	2,93	1,31	0,61

Source: Central Office of Labour, Social Affairs and Family and author's calculations

In the reference period, for those who are interested in participating in the individual measures, the obligation to register has also changed. In 2017, for example, in the case of contribution towards establishing a sheltered workshop or sheltered workplace, funded under §56 of the law, only an employer who has hired a PwD, registered for at least one month in the register of job seekers, for the newly established work place, was eligible. In the case of the contribution for initiation of self-employment paid under §57, the minimum duration of registration was set at three or 12 months.

Figure 5. 14:
Number of sheltered workshops and sheltered workplaces in 2017 by region



	Bratislava	Trnava	Trenčin	Nitra	Žilina	Banská Bystrica	Prešov	Kosice
Number of sheltered workshops/workplaces in the year 2016	289	429	890	560	1 049	723	1 254	836
Number of sheltered workshops/workplaces in the year 2017	269	451	882	552	1 029	712	1 227	869
Number of employees with ZP in the year 2016	567	863	1 520	1 028	1 656	1 423	1 990	1 540
Number of employees in the year 2017	547	971	1 521	1 035	1 581	1 307	1 949	1 592

Source: Central Office of Labour, Social Affairs and Family and author's calculation

Considering the number of participants and the number of supported jobs, a significant shift can be observed towards the use of contributions intended to cover operating costs for a sheltered workshop or sheltered workplace and to cover the cost of transportation of employees, paid according to §60 of the law (see Figure 5.15). This is provided to a legal or a natural person, is realised on quarterly basis and paid as a refund based on documents demonstrating the costs

for the quarter, at 25% of the established amounts[70]. Contribution paid in accordance with §60 is not intended for the creation of new jobs but to support those existing. The contribution's target groups are sheltered workshops and sheltered workplaces, of which there were 5,991 registered in Slovakia, as of 31.12.2017, with the total of 10,503 employees with health disability (of which 1,660 were sheltered workshops with 6,119 employees with a health disability and 4,331 sheltered workplaces with 4,384 employees with a health disability).

In comparison to 2016, the number of target subjects, in addition to their employees, is slightly lower (in 2016, 6,030 sheltered workshops or protected work places were registered with the number of 10,587 employees with a health disability).

The public considers sheltered workshops and sheltered workplaces to be the main areas for employing PwD. In 2017, however, only approximately 11% of the total number of PwD, registered by the Social Insurance Agency as insured persons contributing to social system, thus participating in the labour market, found employment in sheltered workshops/workplaces. However, out of 10,503 PwD working in either sheltered workshops/workplaces, up to 9,762 were supported by contributions paid due to §60 of the Act. This represents up to 93% of all employees of sheltered workshops/workplaces with a health disability. In 2017, the average amount of one paid contribution was 2,916 Euros.

The number of people/jobs supported in 2017 using §56 (contribution to the establishing sheltered workshop/workplace), §56a (contribution to maintaining a person with health disability in employment) and §57 (contribution to a person with disabilities for the operation or performing of self-employed activities), can be, from a statistical standpoint, considered irrelevant on the basis of the low number of paid contributions to the total number of persons with disabilities.

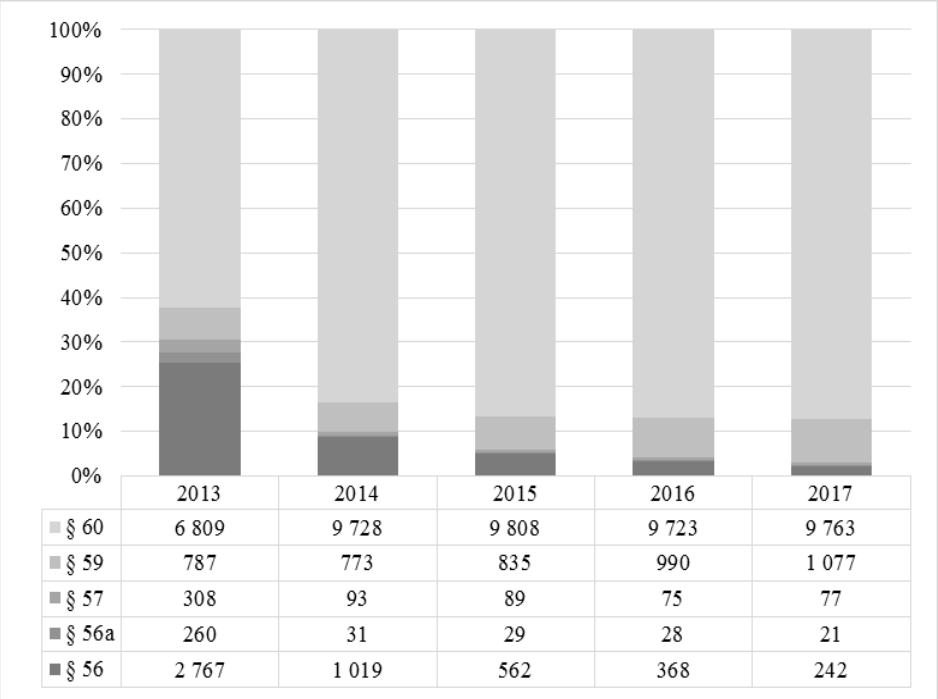
Using §56, the creation of 155 jobs was supported in 2017, in which (including rehiring) 242 PwD were hired in sheltered workshops and sheltered workplaces[71], representing only 2.3% of all persons with disabilities working in sheltered workshops/workplaces. The average amount of one paid contribution was 2,520 Euros.

Using §57, the creation of 77 self-employment jobs for people with disabilities was supported in 2017, representing 0.1% of all PwD registered with the

[70] See rules for the payment of the contribution published on the Central Office of Labour, Social Affairs and Family website
[71] Central Office of Labour, Social Affairs and Family, 2018

Social Insurance Agency as self-employed. The average amount of paid contributions in 2017, within the stated measure, was 4,560 Euro.

Figure 5. 15:
Number of supported jobs within the framework of person AOTP exclusively intended for PwD in year-over-year comparison



	2013	2014	2015	2016	2017
§ 60	6 809	9 728	9 808	9 723	9 763
§ 59	787	773	835	990	1 077
§ 57	308	93	89	75	77
§ 56a	260	31	29	28	21
§ 56	2 767	1 019	562	368	242

Source: Central Office of Labour, Social Affairs and Family and author's calculation

Despite the fact that the ratio of PwD supported by means of one of the instruments of ALMP may not be significant to the total number of PwD participating in the labour market, it can be assumed that, in particular, the measures implemented using §56 and §60 have a significant impact on softening the duplicate marginalisation of PwD aged 50+. This is because more than 50% of supported persons fall within this age category. These are, therefore, people disadvantaged on the labour market not only due to their disability, but also their age. In the case of all of the listed measures, women's participation was dominant (between 55.9 - 65%).

A positive trend can be observed in the case of contribution for the operation of work assistants paid within §59 of the Act, as the number of working assistants increased year-on-year (from 773 in 2014 to 1,077 in 2017). Despite the fact that the work assistant is (both from the employers' and persons' with disabilities points of view) considered a key member of successful positioning and

the maintaining of PwD on the labour market, it is written in the evaluation of ALMP officially published by the Central Office of Labour, Social Affairs and Family: *"On the basis of the evaluation of offices, despite the large scale of use, it appears to be little effective, in particular because of real difficulty in demonstrating a real need of work assistance; in particular in cases of self-employed persons with disability, where it is practically impossible to ascertain whether an assistant carries out assistance in reality and how many hours are provided."*[72] Thus, it can be assumed that the individual offices of labour do not perceive the importance of the work assistant correctly. Orientation to provide the broadest possible range of instruments supporting the entering and retention of people with disabilities often gives way to excessive direction on the administrative control of the individual measures.

In comparison with the portfolio of ALMP aimed at PwD carried out in other EU countries, measures aimed at preventing unemployment among young people and the successful transition of young people from the educational system to work is completely absent in Slovakia. Implemented measures do not exclude this group of candidates; however, the participation of people under the age of 24 is minimal.

Challenges remain with measures aimed at building human capital from people with disabilities, i.e. measures aimed at training and retraining. Measures aimed at the open labour market and promoting diversity, such as implementation of activities aimed at overcoming prejudice against employing PwD on the employers' or potential colleagues' side, are also absent.

Among the obligations resulting from *The National program of development of living conditions of persons with disability for the years 2014-2020*,[73] a commitment to the implementation of amended tools of support and aid intended for PwD, specifically with an emphasis on their employment on the open market, is listed.

Despite the defined commitment, amendment of the instruments and measures, or possibly an initiative that would affect the paradigm of understanding ALMP intended for PwD and their entry and remaining in the labour market has not happened yet. Aid is currently focused on a limited number of instruments with focus on maintaining existing jobs in the environment of sheltered

[72] Central Office of Labour, Social Affairs and Family, 2018
[73] Available on the website of the Ministry of Labour, Social Affairs and Family

workshops and sheltered workplaces, without an explicit[74] link to the open labour market or activities aimed at the building of social capital of persons with disabilities, which is, due to the disability, often limited to their environment.

5.4.2 Forms of offering public employment services

Despite the fact that the Act 5/2004 of Coll. on employment services recognises public as well as non-public employment service providers, active labour market measures have been de-facto implemented only by public providers, therefore by the Offices of Labour, Social Affairs and Family in 2017.

A version of a non-public service provider of employment services with work specialisation in PwD are the Agencies for Supported Employment (ASE). Despite the fact that in the registry of ASE maintained by the Central Office of Labour, Social Affairs and Family, as of 31.12.2017, 56 entities were registered, their involvement is minimal and is implemented more on a personal initiative basis of the individual ASE than as a systemic approach.

Specifically, agencies for supported employment are entities that are able to effectively work with persons with disabilities as well as employers, to whom they are able to provide adequate support. Abroad, ASE are considered to be a key element for success in the context of the support of the employment and employability of disabled people.

A weak involvement rate of non-public service providers by the Offices of Labour was also mentioned in the Action Plan to strengthen the integration of the long-term unemployed[75] into the labour market in the Slovak Republic[76], adopted by the Ministry of Labour, Social Affairs and Family at the end of 2016. One of the tasks is defined as '*Development of cooperation of providers of public employment services with non-state employment services*'. Also, with regard to this task, in 2017, an initiative was established on the basis of the requirement from the Ministry aimed at creating a so-called national project co-financed from the ESF resources. This was focused on the systematic involvement and coop-

[74] In this context, it is important that, in spite of the 'sheltered' workshop/workplace, a number of these jobs has characteristics of employment in the open labour market. Definition of these measures, however, does not concentrate on encouraging relationships with an open labour market.
[75] Despite the fact that only a small percentage of job seekers with disabilities belongs to a category of long-term unemployed, the action plan also includes activities related to other groups of disadvantaged job seekers showing low participation rates in the
labour market.
[76] Ministry of Labour, Social Affairs and Family, 2016

eration with non-public providers registered as Agencies for supported employment, so that conditions for systematic and pertinent provision of special employment services intended for PwD could be created.

Enhancing the partnerships of public and non-public service providers in the form of systematic involvement of Agencies for supported employment is also supported by the Action Plan of transition from sheltered workshops to employment of disabled people in the open labour market (Ondrušová, Kešelová and Repková 2017). This was created in 2017 in response to the recommendations of the UN Committee on the Rights of Persons with Disabilities, which in 2016 expressed its concern about the large number of PwD employed in sheltered workshops and the lack of effective measures to support their employment in the open labour market.

It is currently possible to attribute reasons for the low involvement rates of ASE into the provision of public employment services intended for PwD to the absence of standards of cooperation and measuring of performance. On this basis, it would be possible to determine the payment for the rendering of individual services. Equally, an obstacle is also the unclear picture of the capacity of individual ASE, which will not be possible to start building without systematic and long-term support from the state.

In the Slovak climate and in spite of all the obstacles and concerns that prevent full involvement of ASE into the employment services intended for PwD, international practice shows ASE's key role and importance in long-term and targeted work with PwD and their successful entry/stay in the labour market. It is therefore important to continue with the initiatives that were established in the context of the better positioning of ASE in 2017.

5.4.3 Compulsory employment of persons with disabilities

As in several European countries, a so-called quota system is applied in the Slovak Republic in relation to the employment of disabled people. This is defined in the Act 5/2004 Coll. on employment services through paragraphs 63-65 and obliges employers who hire at least 20 staff to employ PwD for at least 3.2% of the total number of workers. The number of employees with disability, who the employer is obliged to employ as well as the actual number of employees with disability is rounded to the nearest whole number, from 0.5 upwards. In practice, this means that if the average number for the calendar year was 20 employees, the employer is obliged to employ one PwD. Similarly, if the number

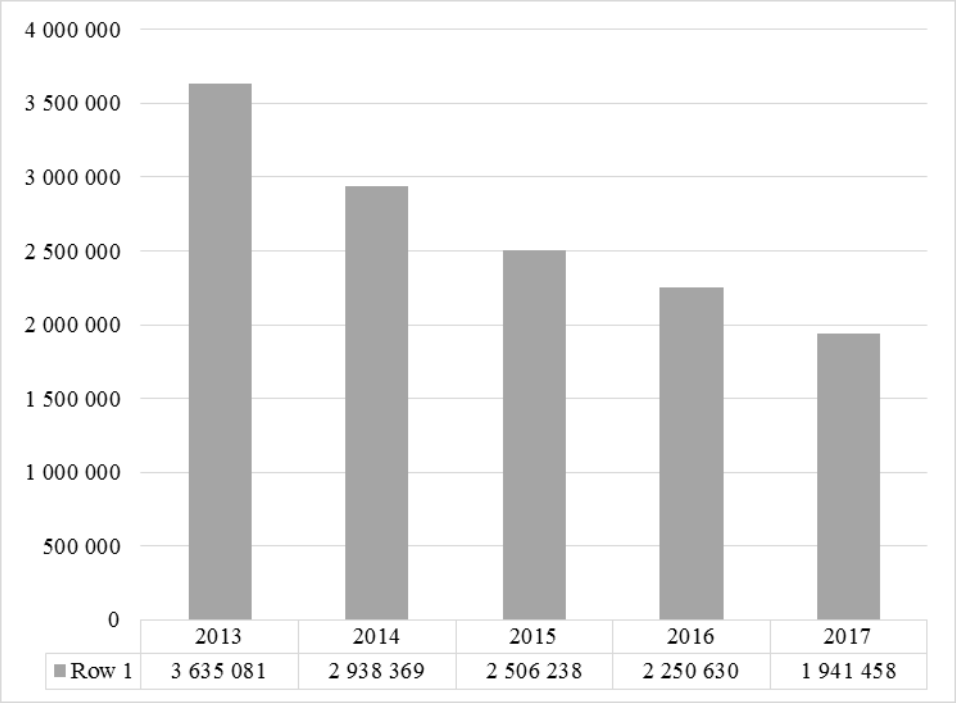
was, for example, 100 employees, the employer is obliged to employ three PwD and at 500 employees, 16 PwD (Ondrušová, Kešelová 2015). If the employer hires a PwD, who has, due to a long-term adverse health state, a more than 70% reduction in their ability to perform gainful activity, for the purposes of the compulsory rate of employment of staff with disability, this is counted as if the employer employed three PwD. Employers demonstrate fulfilment of this obligation once a year to the Central Office of Labour, Social Affairs and Family.

In case the employer does not employ disabled persons for any reason, the obligation regarding the compulsory rate of employees with disabilities can be filled by contracting an order suitable for employing PwD or by contracting an PwD who operates as self-employed. Such contracts are, in practice, carried out via sheltered workshops or sheltered workplaces. Starting in 2018, when Act 112/2018 Coll. on social economy and social enterprises will enter into force, these will also be social enterprises of work integration employing at least 30% PwD. Minimum price contracts representing a substitute for one employee with disabilities is determined by the Act to be 0.8 times the overall labour price calculated from the average wages of an employee in the Slovak Republic, which in 2017 was 929 Euros per not employing one PwD. If the employer does not provide compulsory employment for people with disability and does not contract within the specified range, he is obliged to pay the levy, which is equal to the amount of 0.9 times the total price of the work calculated from the average wage of an employee in the Slovak Republic, which, in 2017, was 1,049 Euros.

The funds from employers' levies are considered to be non-tax revenue from the state budget within Chapter 22 - Ministry of Labour, Social Affairs and Family. The aim of the payments, according to the explanatory memorandum, is '*to contribute to obtaining of funds from which employment of citizens with disabilities will be supported*'. However, for what purpose the funds are used in reality could not be determined, as they are not earmarked.

In the absolute nominal value, the scope of the funds collected through the levies for failure to meet the compulsory rate of employment of citizens with disabilities, pursuant to §65 of the Act on Employment Services in year-on-year comparison is substantially declining.

Figure 5.16:
Revenues of the treasury from the levies for non-employment of PwD



Source: Draft budget headings for each of the years presented for negotiations from the Slovak Republic government.

Despite the fact that the decrease represents a loss of income for the Ministry of Labour, Social Affairs and Family's budget, the trend can be interpreted as positive. It indicates employers' growing involvement in performing duties arising from the compulsory employment of PwD, either by direct employment or by substitution of performance in the form of awarding a contract, which certainly represents a positive impact regarding employing PwD.

It is possible to assume that, due to the economic cycle phase in which Slovakia found itself in 2017 (i.e. economic growth phase), in combination with the lack of availability of labour and with the increasing age of the working population, employers are filling designated quotas for PwD employment. This is despite the absence of special efforts in favour of employing of people with disability.[77]

[77] Fuchs, 2014

5.4.4 Protection of employees with disabilities

Current §66 of Labour Code states:

'*An employer may give notice to an employee with a health disability only with the prior consent of the relevant Office of Labour, Social Affairs and Family, otherwise notice shall be invalid. Such consent shall not be required where notice was given to an employee who has reached the age entitling him/her to old-age pension or for reasons as stipulated in §63, paragraph (1), letters a) and e).'*

§ 63(1):

An employer may give notice to an employee only for the following reasons:

a) the employer or part thereof 1. is wound up or 2. is relocated and the employee does not agree with the change in the agreed location for the performance of work.
b) ...
c) ...
d) ...
e) if there are reasons on the part of the employee, for which the employer might immediately terminate the employment relationship with him/her, or by virtue of less grave breaches of labour discipline; for less grave breaches of labour discipline, the employee may be given notice if, with respect to breach of labour discipline, he/she has been cautioned in writing within the previous six months as to the possibility of notice.

The Labour Code therefore guarantees employees with disability a higher degree of protection against termination compared to conventional employees.

Such a measure was certainly drafted and is maintained in good faith. In practice, however, it often has counterproductive effects.

Employers often voice their concerns through various platforms about the employment of PwD, since they are subsequently 'unfireable'. Employers often repeat stories about their negative experience with a particular employee with disabilities, whom '*it was* impossible *to lay off*'. These stories are often repeated, in spite of the fact that the majority of employers admit that usually this was a unique case and the employment of other people with disabilities posed no problems. Negative experience with the excessive protection is usually rooted so deeply that it has become an obstacle to involving other employees with disabilities.

Despite the fact that there is no known research that can confirm the reasons for employers' concerns when hiring PwD today, worries concerning the increased protection of PwD, in the process of potential terminations, established in the Labour Code, can be considered, based on the expert assessment, as one of the major reasons for concern and prejudice.

5.4.5 Reduced payment obligation

Act No 580/2004 Coll. on health insurance and the amendment of Act No. 95/2002 Coll. on insurance and on amendments and supplements to certain laws offers PwD, through §12, the possibility of utilisinge a reduced rate of compulsory health insurance to 50%; i.e. from the current 14% to 7% on the basis of assessment. This claim is relevant for employees as well as self-employed persons with disabilities.

To utilise this claim, it is sufficient to submit valid disabled person's ID, issued by the corresponding Office of Labour, Social Affairs and Family, or the proof of receipt of a disability pension. Also based on interviews with a sample of four PwD, it can be concluded that the utilisation of a claim for a reduced insurance rate is quite a popular tool, but it certainly does not present any key argument for employing PwD. Rather it constitutes a welcome bonus, which quietly increases the net income of employees/self-employed persons with disability. This claim is also based on the fact that it has not been possible to identify an employer who would specialise in employing PwD and reflect the reduced cost of their employment in its pricing policy. This is despite interviews with three non-profit organisations specialising in aid for PwD, regarding their entry and remaining in the labour market.

5.5 Conclusion and recommendations

At a general level, it is possible to say that the rate of PwD participation in the labour market has experienced an increasing trend in Slovakia in 2017. In comparison to 2016, according to the Social Insurance Agency, the rate of such participation increased by 1.6%, which, in absolute value, represents a yearly increase by almost 4,800 people. Despite the positive trend, the employment rate of PwD in Slovakia is still lagging in comparison with other EU countries and 60% of PwD of productive age still remain outside the labour market.

From the total number of PwD, registered at the Social Insurance Agency as persons participating in the labour market, 11% are employed in sheltered workshops and sheltered workplaces, of which more than 90% are financially supported by contributions from ALMP.

Generally, it is possible to say that in the ALMP portfolio explicitly and exclusively intended for PwD, measures aimed at the establishment and operation of sheltered workshops and sheltered workplaces dominated in the year 2017, as well. Specialised measures aimed at building human and social capital, through the successful transition of PwD from the educational process to employment, or via the provision of special employment services, were completely absent.

In 2017, a year-on-year reduction in the number of sheltered workshops was again recorded. This can be seen as a development in line with international trends. However, in Slovakia's case, a drop in the number of sheltered workshops is not offset by an increase in other instruments aimed at improving and maintaining employment of PwD. Anticipation is surrounding the new Act on the social economy and social enterprises, which was prepared in 2017 and gives special attention to labour-integration social enterprises and PwD.

In 2017, the Ministry of Labour, Social Affairs and Family, as the main sponsor of questions related to the topics of employment and employability of PwD, was oriented towards the preparation of an action plan for the transition of PwD from the sheltered workshops into the open labour market. This was created as a response to concerns raised by the UN Committee for the rights of PwD with respect to high numbers of PwD working in sheltered workshops.

With the goal of promoting employment growth for PwD, policy-makers and other parties involved should focus on the following areas:

- ***The existence and functioning of agencies for supported employment and case management***

The form and subsequent quality in the provision of public employment services in the context of employment PwD is regarded as one of the key elements for success. In the long-term, services specifically designed and intended for PwD are lacking in Slovakia, without mentioning further segmentation in the specialisation of individual types of disability. International practice, in addition to expert discussions, confirm that the agencies for supported employment (ASE) are organisations that could fill this gap in Slovakia and focus on long-term work with clients in the form of individualised case-management.

In 2017, a more intensive buzz was generated in the Ministry of Labour, Social Affairs and Family concerning the systematic support of ASE. However, it is necessary to implement these efforts into real schemes aimed at the systematic involvement of ASE in the provision of employment services intended for PwD.

With the goal of involving PwD in the provision of public employment services, it is also important to focus on building a network of ASE and to standardise the offered services (including the remuneration system of ASE and determining the indicators of success) and to better link employment services with social services.

- ***Preventing unemployment among young PwD***

Despite the fact that preventing unemployment among young people in Slovakia is considered to be one of the important issues in the debate about ALMP, measures specifically designed for the needs of young people with disability, intended for their smooth transition from the educational system to the labour market, are lacking. The ALMP portfolio, exclusively intended for PwD, is dominated by participants aged 50+ (more than 50%). Significant participation by young people with disability on other ALMP has not been confirmed. Based on available data from the Social Insurance Agency, it is not possible to determine the age structure of PwD participating in the labour market. However, based on knowing the field, it is possible to assume that a significant proportion of graduates and young people with disability remains outside the labour market. In order to overcome this situation, it is necessary to start creating programmes that identify young people with disability in the educational process and focus on ensuring their smooth transition to the labour market. The implementation of such programmes requires an individualised approach, creating another argument in favour of support for ASE, as this style of approach is considered to be the cornerstone of their operation.

- ***Promotion of human and social capital of PwD***

According to literature, one of the main objectives of ALMP aimed at PwD should be providing tools aimed at overcoming social isolation, as risk is very high in the case PwD: it is an obstacle to building social and human capital. Lack of human and especially social capital, resulting from disability, is considered to be a significant complication in efforts aimed at entry to the labour market.

Activities aimed at building human capital are directed towards education and retraining. Those aimed at building social capital focus on strengthening contacts outside the PwD community. Both are measures aimed at increasing employability: this had hardly been implemented in 2017. Then, PwD had the opportunity to participate in programmes aimed at training intended for job-seekers in general. However, it was not confirmed that these educational events reflected the specific needs of PwD (for example, at least by removing barriers), therefore participation of PwD at these events was minimal.

- ***Overcoming employers' prejudice and concerns***

Several studies show high levels of concern about the employment of PwD on the employers' side, stemming from a lack of personal experience with PwD. Currently, in Slovakia, there are no education/training programmes aimed at integrating PwD into the labour market, which would, in a qualified way, provide information on the essential characteristics of various types of disability, or the existence of/availability of compensatory aids which could level restrictions arising from disability.

In the process of employment of PwD, support for the employer and his/her closest colleagues with disability is often forgotten, although they often do not know how to react when in contact with PwD. This ignorance often and unnecessarily leads to inadequate and difficult situations, leading to a negative influence on the perception of employing PwD.

Due to increasing rates of employers' involvement in favour of PwD, initiated especially by multinational corporations and the trend to promote diversity in the workplace, there is a demand for the development of support programmes for the employer. These may be provided either in the form of education/training events or an online tool.

- ***Capacity of PwD orientation and the role of a work assistant***

In the context of the perception of disability, regarding human rights in connection with the labour market, it is not possible to identify a job that en bloc could be described as unfit for a person with specific type of disability. The particular person's capacity and the existence of/accessibility to compensation overcome restrictions arising from disability in many cases. People's attitude and focus on identifying options for PwD, instead of concentrating on identifying restrictions, is considered to be equally important and significant as accessibility to compensation aids. When assessing the capacity of PwD, it should be determined what activities the person can perform instead of the current approach, where the activities that the person is unable to carry out are highlighted. In essence, it is a paradigm shift in the perception of disability in the workplace. The presence of a work assistant, whose role is to support not only the PwD in the course of his work but also to assist the working environment of the employee with disability, to better integrate and receive him, can facilitate this change. The task of the workplace assistant is particularly important in the processes of entry and adaptation to the new workplace and should be viewed as such by the Offices of Labour, Social Affairs and Family.

- ***Unifying the disability evaluation system***

Currently, the two approaches of the disability assessment system means, in practice, that there are many unnecessary complications in the access to compensation aids and understanding of employing PwD.

The subject of simplifying the disability evaluation system has been long discussed. However, in 2017, there were no recorded specific actions that would lead to simplification.

An important element is the shift in the paradigm of the perception of disability, which is currently seen more from the medical viewpoint while the pedagogic-social aspect remains unnoticed, despite the fact that it often constitutes a significant part of restrictions arising from disability.

6 LABOUR MARKET INEQUALITIES AND THEIR REPRODUTION FROM A CLASS PERSPECTIVE: CLASS-BASED ANALYSIS OF SOCIAL STRATIFICATION AND SOCIAL MOBILITY[78]

Daniel Gerbery, Roman Džambazovič

6.1 Introduction

The article deals with labour market inequalities and their reproduction. This theme is of great interest especially to economists and sociologists. We apply a sociological perspective here, examining positions in the labour market in terms of social classes. It means that rather than focusing on wages and income, we pay attention to social relations in the economic life institutionalised in employment relations. Instead of wage or income inequality and mobility, we will talk about employment-based social class membership and its intergenerational change. We hope that this type of analysis will provoke discussion between sociologists and economists in Slovakia who have a shared interest in understanding the nature and long-term dynamics of labour market inequalities.

The chapter is divided into four parts. The first part offers rationales for the choice of social class perspectives on social stratification and social mobility. The second part explains foundations of the approach and describes two social class schemes that are mostly used in sociological research. Next, an analysis of empirical data follows. In the third section, the class structure in Slovakia and its changes are shown. In the fourth part, attention is paid to social mobility, which is analysed through various log-linear models. As log-linear modelling includes various approaches, we describe its general principles in the field of social mobility and explain the logic of the selected models. The models' parameters, estimated in the software lEM (Vermunt 1997), allow for testing hypotheses about the nature of intergenerational transmission of class membership. We select only a limited number of the models, with the aim to demonstrate the usefulness of social mobility analysis based on log-linear modelling.

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6.2 Why social class analysis?

Social class refers to a relational approach to social inequality, as opposed to an attributional one. While the attributional approach understands inequality in terms of the distribution of attributes (income, wealth, consumption) that cause differentiation/inequality of the members of society, the relational approach focuses on a structured form of inequality which is embedded in prevailing forms of social relationships that have an economic institutional basis (Goldthorpe 2010: 733). The position in the labour market plays a key role in this respect because it contains systematically produced and maintained advantages or disadvantages, resources, opportunities as well as their barriers. Thus, social classes — as categories of similar labour market positions — represent a major determinant of life chances and life choices. According to Goldthorpe and McKnight (2006: 129), "individuals in different class positions could in fact be seen as living in quite different economic worlds, not just as regards their levels of material welfare but, further, as regards the whole range of economic life chances – of risks and opportunities – that they face".[79] In addition, consequences of social class membership in the field of differentiation of cultural consumption and lifestyle, as well as political behaviour, have been identified over the last decades.

Social classes, as understood here, are defined on the basis of theoretical arguments concerning the structural positions in the labour market and their operationalisation. Thus, social class analysis does not start from the empirical merging/categorisation of people with similar work experiences. Instead it is a theoretically driven approach, which is then testified by empirical investigation. Social classes represent structural "empty places" which exist independently of persons who fill the positions. However, the locations of social classes within the social stratification system are not given once and for all. As social classes are relational concepts, the position of one social class defines the position of another one, and vice versa (Katrňák, Fučík 2010: 20).[80]

The categorical, relational understanding of inequality differs from the approach preferred by economists. The difference becomes apparent in the field of intergenerational social mobility, which is closely related to the analysis of ine-

[79] These economic worlds differ, for example, with respect to economic security, stability, or economic prospects.

[80] In addition to this categorical (class) approach, there are hierarchical approaches that define positions in the labour market in terms of income, education and/or occupational prestige. Labour market positions are then understood as a (vertically ranked) continuum (Katrňák, Fučík 2010: 20) and expressed as scores attached to occupational titles, based — for example — on the average educational attainment and earnings (Morgan 2006: 4). The International Socio-Economic Index of Occupational Status (ISEI) and the Standard International Occupational Prestige Scale (SIOPS) represent the most prominent examples.

quality and social stratification (and which is also covered by this chapter). Sociological answers to the question "Mobility between what?" rely on modelling relationships between the class positions of parents and children, with the aim to identify the structure of patterns of mobility (Morgan 2006: 4). The focus is on cross-classification of two variables and its various forms established by adding other parameters or breakdowns. In economics, intergenerational mobility is mainly captured by a single number, expressing the intergenerational correlation of incomes. Different perspectives translate into different methodological apparatuses: log-linear modelling in sociology and regression-based approaches in economics.[81] A further important difference lies in the way in which the impact of structural changes on social mobility is treated (Morgan 2006: 5). In sociology, structural and "pure" (exchange) mobility are distinguished, which allows for the identification of life chances purged of long-term changes in the social stratification system. Economists tend to focus on the consequences of economic growth, as well as the impacts of various forms of labour market inequality on mobility outcomes. Despite these differences, sociology and economics have also experienced similar developments. Growing interest in the mechanisms of intergenerational mobility (e.g. the role of education, skills), shifting from formal theory towards empirical modelling, may serve as examples. In addition, the categorical approach to structural inequality in the labour market has been gradually recognised among economists, resulting in analyses of income quintiles through techniques that are similar to log-linear modelling of class mobility (ibid.).

Thus, why social class analysis? It offers a picture of structurally produced and reproduced life chances. The chances are embedded in the economic realm — in the way in which the economic and labour relations are organised and institutionalised. It allows tracking inequalities in the labour market at a deeper level as compared to approaches focusing on the distribution of pure attributes. Furthermore, social class analysis provides a set of methodologically promising tools for measuring the intergenerational transmission of inequality (social mobility). The way in which these advantages materialise depends on the choice of a specific social class scheme. In the next part we will describe two schemes which will be used in empirical analysis.

6.3 Classifying the classes: EGP and ESeC schemes

There are several social class schemes that differ in respect of the theoretical background, operationalisation of the class position, or measurement issues. We

[81] The hierarchical (status) approach to social class in sociology leads to methodological choices similar to those that can be found in economics.

opt for the EGP class scheme[82] and the ESeC class scheme, which belong to the most used and most frequently testified analytical frameworks within social stratification studies. Previous analyses showed that these schemes are valid in Slovakia (see, for example, Bunčák et al. 2013; Bunčák, Hrabovská, Sopóci 2018b). The EGP scheme was developed by John H. Goldthorpe and his colleagues in the 1970s. Since then it has been modified and it took its current form in the early 1990s (Erikson, Goldthorpe 1992). It is usually classified as part of Weberian tradition and is referred to as a neo-Weberian class scheme (Breen 2004). In our study, the EGP scheme serves as a tool for the description of long-term development of social stratification in Slovakia. The reason behind this is that this is the only social class scheme that we were able to reconstruct from older data covering the period from 1988 to 2016. The ESeC scheme, which stands for European Socio-economic Classification, is based on the EGP scheme. It was developed by David Rose and Eric Harrison (Rose, Harrison 2010) in order to provide an alternative to the EGP, which would better reflect the labour market conditions in the EU countries. The ESeC scheme will be used to analyse the social mobility of current labour market participants.

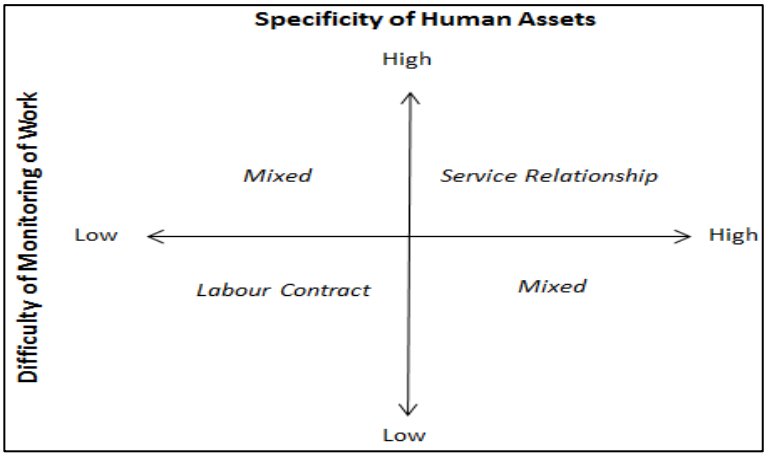
Social classes, as understood here, are determined by employment relations (see, for example, Breen 2004; Erikson, Goldthorpe 1992; Goldthorpe 2000; Goldthorpe, McKnight 2006). It leads to two distinctions. In the first step, three basic positions in the labour market are distinguished: employers, self-employed workers, and employees. In the second step, a further distinction among employees is made, based on the mode of regulation of employment, which refers to the nature of their employment contracts. Employment contracts are conceptualised from the standpoint of employers, "with whom the initiative in their design and implementation does at all events lie" (Goldthorpe 2000: 211) and who face a contractual hazard, which stems from the fact that employment contracts are often implicit or incomplete in relation to employees' obligations and demands.[83] Relying on the legacy of organisational and transaction cost economics, two aspects of employment contracts are taken into account: difficulty in the monitoring of work (performed by employees) and the level of human asset specificity of employees. In the first case, employment contracts differ with respect to "the degree of difficulty involved in monitoring quantity of work and observing and controlling its quality". In the second case, contracts differ in respect of the degree of specificity of human capital (skills, expertise) used by employees,

[82] The scheme is named after the three original authors: Erikson, Goldthorpe and Portocarero (1979).
[83] For example, contracts do not contain details concerning the intensity of work effort, the degree of initiative, or adaptability.

referring to "the degree to which productive values would be lost if these assets were to be transferred to some other employment" (Goldthorpe 2000: 213).

As a result, employment contracts take different forms depending on the types of tasks and roles performed (Figure 6.1). Two basic forms of employment contracts include *labour contract* and *service relationship*. A service relationship is typical for non-manual professionals, administrative officials, managers, or (well-educated) technicians whose work activities are difficult to monitor and require specific skills and expertise. These employees supply services to their employers based on long-term and less specified exchanges. Compensation contains not only financial rewards but also other advantages, including a higher degree of autonomy for employees, job stability, better financial compensation, and future job prospects. On the other hand, a labour contract is applied especially to manual workers (in industry, agriculture) whose work activities require lower qualifications and relatively simple control and monitoring. Employees with a labour contract are involved in relatively short-term and specific exchanges of money for effort (ibid.). Advantages offered by this mode of work regulation are much more limited in comparison to advantages produced by a service relationship. As Figure 6.1 shows, there are also contracts that combine features of service relationship and labour contracts. Mixed forms of contracts are associated with positions of routine non-manual workers in administration, trade and services, as well as positions of less qualified technicians and supervisors of manual workers.

Figure 6.1:
Dimensions of work as sources of contractual hazard and related employment contracts



Source: Goldthorpe (2000: 223)

The EGP class scheme has a relatively complex structure (Table 6.1).[84] There are three main class positions: employers, self-employed, and employees. Positions of employers are divided into two groups: large employers (class I) and small employers (classes IVa, IVb, and IVc). Self-employed persons' positions are classified according to the sector: self-employed positions in industry and agriculture (classes IVb and IVc). Positions of employees are categorised according to the type of employment contract into three basic groups: a) positions based on a service relationship, subdivided according to the qualification level into classes I and II; b) positions with a mixed contract (classes IIIa, IIIb, and V); and c) positions with a labour contract, consisting of manual work in industry and manual work in agriculture (classes VI, VIIa, and VIIb).

Table 6.1:
EGP class scheme

Class	Description	Type of contract
Service class (Salariat)		
I	Large proprietors; higher-grade professionals, administrators, and officials; managers in large firms	Employers or service relationship
II	Lower-grade professionals, administrators, and officials; higher-grade technicians; managers in small firms; supervisors of non-manual employees	Service relationship
Intermediate class		
IIIa	Higher-grade routine non-manual employees in administration and commerce	Mixed form of contract
IIIb	Lower-grade routine non-manual employees in administration, commerce and services	Mixed form of contract
IVa	Small proprietors, artisans, self-employed with employees	Employers
IVb	Small proprietors, artisans, self-employed without employees	Self-employed
IVc	Farmers, small holders, self-employed in primary production	Employers or self-employed
V	Lower-grade technicians, supervisors of manual workers	Mixed form of contract
Working class		
VI	Skilled manual workers	Labour contract
VIIa	Unskilled manual workers (not in agriculture)	Labour contract
VIIb	Unskilled manual workers in agriculture	Labour contract

Source: Erikson, Goldthorpe (1992: 38)

In summary, the EGP class scheme distinguishes 11 classes. *Service class* (classes I and II) includes proprietors of means of production as well as non-proprietors, who perform non-manual work and fulfil the (service-relationship-

[84] The Roman numerals are used to label classes.

based) positions with the highest prestige (white collars). *Intermediate class* represents a mixed class (white and blue collars) in two respects: it includes proprietors and non-proprietors on the one hand and positions characterised by manual and non-manual work on the other hand. *Working class* consists only of manual non-owners. Although the EGP class scheme does not imply an unambiguous hierarchical ranking, some kind of hierarchy in the scheme can be identified. While the service class is considered to occupy the highest positions, working class can be found at the opposite end of the scale. This kind of implicit ranking is used in analyses of social mobility.[85]

In addition to its solid theoretical background, the popularity of the EGP scheme is due to its simple operationalisation for the purposes of empirical surveys. It requires only limited information concerning respondents' employment, which indicates market and work situations: information on the basic position in the labour market (employer, self-employed, employee), the ISCO code of employment, the number of employees or the number of subordinated persons in the workplaces. Although the EGP class scheme was originally conceived primarily for analyses of employment structure in Great Britain in the 1970s, a series of amendments adapted the class scheme to the changing labour market conditions and their variability in developed countries. In the first half of the 1990s, Harry Ganzeboom and Donald Treiman took an important step by preparing a standardised operationalisation of the EGP scheme into measurable indicators and developing a publicly available algorithm for the empirical identification of class positions within national occupational systems. However, a full version of the scheme, consisting of 11 classes, is rarely used. Empirical analyses usually employ shorter versions, as recommended by the authors of the original scheme. Depending on the nature of empirical data and the aims of the empirical analysis, researchers can use schemes with three, five or seven classes. Table 6.2 shows ways in which to reduce the scheme with 11 classes to more parsimonious ones.

The ESeC scheme relies on the EGP classification. They both share a theoretical background, including a relational approach to social inequality, highlighting the key role of the labour market position and its theoretical framing, as well as the role of social classes in determining life chances. On the other hand, as authors state, "ESeC improves on the EGP scheme in terms of more thorough validation and better documentation for comparative purposes" (Harrison, Rose 2006). They also add that "ESeC has advantages over the existing international

[85] As can be seen from Table 6.1, the EGP scheme captures only persons who participate in the labour market. Economically inactive persons are not taken into account. Unemployed persons can be included in the scheme by identifying features of their last job. This limitation should be kept in mind when interpreting observed distributions of classes. In particular, it should be taken into account in times of major social and economic changes.

versions of EGP. It is more transparent, better documented, more user-friendly and is based on the most recently available evidence on employment relations" (Rose, Harrison 2007: 487). In contrast to the EGP, they distinguish four basic market positions. Three classes identified by the EGP (employers, self-employed, and employees) are supplemented by persons involuntarily excluded from paid employment. This fourth category consists of people who have never worked but would wish to and the long-term unemployed. Furthermore, in order to increase coverage of the population, other non-employed persons — such as economically inactive persons (the retired), the sick and disabled, and the short-term unemployed — are classified according to their last occupation.

Table 6.2:
Full and shorter versions of EGP class scheme

<table>
<tr><th>Full version</th><th colspan="2">Version with seven classes</th><th colspan="2">Version with five classes</th><th colspan="2">Version with three classes</th></tr>
<tr><td>I</td><td rowspan="2">I + II</td><td rowspan="2">Service class</td><td rowspan="4">I + II + III</td><td rowspan="4">White collars</td><td rowspan="6">I + II + II + IV</td><td rowspan="8">Non-manual workers</td></tr>
<tr><td>II</td></tr>
<tr><td>IIIa</td><td rowspan="2">III</td><td rowspan="2">Routine non-manual workers</td></tr>
<tr><td>IIIb</td></tr>
<tr><td>IVa</td><td rowspan="2">IVa + IVb</td><td rowspan="2">Petit bourgeoisie</td><td rowspan="2">IVa + IVb</td><td rowspan="2">Petit bourgeoisie</td></tr>
<tr><td>IVb</td></tr>
<tr><td>IVc</td><td>IVc</td><td>Farmers</td><td>IVc + VIIb</td><td>Farmers</td><td>IVc + VIIb</td><td>Farm workers</td></tr>
<tr><td>V</td><td rowspan="2">V + VI</td><td rowspan="2">Skilled workers</td><td rowspan="2">V + VI</td><td rowspan="2">Skilled workers</td><td rowspan="3">V + VI + VIIa</td><td rowspan="3">Manual workers</td></tr>
<tr><td>VI</td></tr>
<tr><td>VIIa</td><td>VIIa</td><td>Unskilled workers</td><td>VIIa</td><td>Non-skilled workers</td></tr>
<tr><td>VIIb</td><td>VIIb</td><td>Agricultural labourers</td><td>VIIb</td><td></td><td></td><td></td></tr>
</table>

Source: Erikson, Goldthorpe (1992)

While employers are divided according to the degree and exercise of managerial authority (large employers and small employers), the self-employed are differentiated according to their occupation, and employers according to the type of contract. There are three types of contracts which reflect employees' different labour market situations (source of income, economic security, and prospects of economic advancement) and work situations (location in systems of authority and control at work): service contract, labour contract, and mixed contract (Harrison, Rose 2006: 4). These three forms of regulation of employment relations are identical to those in the EGP scheme. However, the final class scheme looks different, as Table 6.3 shows.

Class 1 (*Higher salariat*) consists of large employers, higher-grade professional occupations, and higher-grade administrative and managerial occupations.[86] Higher-grade professional occupations and higher-grade administrative and managerial occupations are regulated by a service contract. Within Class 2 (*Lower salariat*), lower-grade professional occupations are characterised by a modified service contract (and not by a full or pure service contract) because their skills are more readily transferable and less organisationally specific. Lower-grade administrative and managerial occupations show high asset specificity (it is expected that they have a high degree of organisation-specific knowledge). Despite this fact, their employment relations are also regulated by a modified service contract because their work requires only routine monitoring. Similar holds true for higher-grade technicians.

Higher-grade white collars within Class 3 work with a mixed contract because there is a high degree of difficulty with regard to the monitoring of performed work. Classes 4 and 5 include small employers and the self-employed. While Class 4 consists of non-professional occupations[87], Class 5 refers to occupations in agriculture and related fields. Class 6 is similar to Class 3, as it is also based on a mixed contract. But the reason behind this is different. While in Class 3 there is — from employers' point of view — a problem with monitoring, in Class 6 there is a higher degree of asset specificity, which requires more specific regulation. Occupations in Classes 7 and 8 are regulated by a modified labour contract, which means that the nature of work requires modification of the basic (pure) labour contract in order to respond to "difficulties" faced by employers. A pure labour contract is typical for Class 9, consisting of occupations which can be easily monitored and lack any asset specificity. Class 10 is a specific category, as it is not related to labour market participation. Therefore, it is often put aside in empirical analyses. In this case, the long-term unemployed are classified according to their last paid job.

The ESeC as a whole does not imply consistently ordered categories. On the other hand, some classes do have clear advantages over other classes. For example, Classes 1 and 2 show greater long-term income security, less income fluctuation, or better future prospects than Classes 2, 6, 7, 8 and 9 (Rose, Harrison 2007: 465). Moreover, its shorter versions strengthen — by reducing the scheme's complexity — previously implicit ranking of social classes.

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[86] The description of the classes in this paragraph is based on Rose, Harrison (2007: 466–469).

[87] The authors point out that self-employed and smaller employer professionals belong to the same class as employees of their profession, as professional status represents a key criterion (Rose, Harrison 2007: 466).

Table 6.3:
ESeC class scheme – full and shorter versions

Full version	Version with six classes	Version with three classes
1. Higher salariat: large employers; higher-grade professional, administrative and managerial occupations Contract: service relationship	1 + 2 (Salariat)	1 + 2 (Salariat)
2. Lower salariat: lower-grade professional, administrative and managerial occupations, and higher-grade technician and supervisory occupations Contract: modified service relationship		
3. Higher-grade white-collar workers: non-manual higher-grade occupations Contract: mixed	3 + 6 (Intermediate occupations)	3 + 4 + 5 + 6 (Intermediate classes)
4. Petit bourgeoisie: small employers and self-employed (not in agriculture) Contract: not applicable	4 + 5 (Small employers and self-employed)	
5. Petit bourgeoisie: small employers and self-employed in agriculture Contract: not applicable		
6. Higher-grade blue-collar workers: lower supervisory and lower technician occupations (higher-grade manual occupations) Contract: mixed	3 + 6 (Intermediate occupations)	
7. Lower white collars: lower service, sales and clerical occupations (lower-grade non-manual occupations) Contract: modified labour contract	7 (Lower white collars)	7 + 8 + 9 (Working class)
8. Skilled workers: lower technical occupations Contract: modified labour contract	8 (Skilled workers)	
9. Semi- and non-skilled workers: routine occupations Contract: labour contract	9 (Semi and non-skilled workers)	
10. Unemployed: never worked and long-term unemployed Contract: not applicable	10 (Unemployed)	10 (Unemployed)

Source: Rose, Harrison (2007: 464–470)

6.4 Long-term changes in class structure in Slovakia

Based on data from empirical sociological surveys[88], we can analyse the development of the social class structure in Slovakia. We focus here on the period from 1988 to 2016, which allows us to compare various stages of socioeconomic transformation as well as recent developments in Slovakia. We examine this

[88] The list of empirical sociological surveys that we used for analysis is presented in the Annex.

period in terms of the EGP scheme, as surveys contained questions that are necessary for the identification of social classes according to the EGP scheme. The surveys differ in some methodological aspects (type of sampling procedure, sample size), but these differences do not prevent a direct comparison of findings, as other studies have shown (see, for example, Katrňák, Fučík 2010). The main findings on the "weight" of social classes within the stratification system are summarised in Table 6.4, which rely on the EGP scheme with 10 classes.

Survey data confirm that the last years of socialism in Slovakia were characterised by a high presence of the working class, which represented a majority of the economically active population (53.9%). It is no surprise, taking into account long-term institutional settings and official political objectives. Unskilled manual workers (with the exception of unskilled manual workers in agriculture) represented the largest social class, but the size of the class of skilled manual workers lagged behind only by a small margin. The service class represented almost 25% of the economically active population. When we add the proportion of routine non-manual workers to that number, we can see that the "weight" of the white-collar class was 40.5%. Data also confirm that at the end of the 1980s, the shape of the class structure was influenced by strong limits for economic activities of self-employed persons, including private farmers.

Since 1989, social stratification has radically changed due to three macrosocial shifts that played an important role. Firstly, the occupational structure was changed dramatically. A marked decrease in the share of manual (both skilled and unskilled) work professions and workers in agriculture occurred, accompanied by a persistent increase in the share of small entrepreneurs (Bunčák et al. 2013). Secondly, changes in the educational structure caused primarily by the expansion of secondary and tertiary education represented a key factor. Last but not least, there were effects of changes in the demographic structure and reproductive behaviour of the population. As a result, since 1989 the sizes of social classes have changed dramatically — and they have changed in such a way that we can talk about the "*upgrade of class structure*" in Slovakia.

Above all, the position of the working class shrank. This is true especially for skilled manual workers and unskilled manual workers. While in 1993 skilled manual workers represented 21.4%, in 2016 they represented only 15.8%. The share of unskilled manual workers dropped by eight percentage points between the years 1993 and 2016. Adding together all shifts, the size of the working class shrank from 49.6% in 1993 to 31.3% in 2016. On the other hand, the growing need for a more skilled labour force, together with the growth of trade and the service sector, was translated into the expansion of three other classes: small entrepreneurs, lower part of the service class, and especially routine non-manual

workers. The share of routine non-manual workers increased by more than 11 percentage points in the post-1989 period (1993–2016), which represented the biggest change amongst all social classes. In 2016, more than one quarter of persons in the labour market belonged to this class, which consists of higher-grade and lower-grade routine non-manual employees in administration, commerce and services and which is characterised by a mixed employment contract. Self-employed persons (both with and without employees) experienced a similar expansion, with growth from 3.9% in 1993 to 13% in 2016.

Thus, the upgrade of the class structure in Slovakia was a result of the contractions of classes with the positions regulated by a labour contract and the expansion of classes with the positions regulated by mixed and service contracts, as well as the expansion of employers.

Table 6.4:
Development of class structure in Slovakia according to EGP class scheme (%)

Class	1988	1993	2001	2008	2012	2016
Service class						
I. Large proprietors; higher-grade professionals, administrators, and officials; managers in large firms	11.0	10.0	10.8	8.0	8.0	9.1
II. Lower-grade professionals, administrators, and officials; higher-grade technicians; managers in small firms; supervisors of non-manual employees	14.9	17.4	13.0	13.5	16.0	19.4
Intermediate class						
IIIa+b. Routine non-manual workers	14.6	14.3	24.0	21.0	21.9	26.1
IVa. Self-employed with employees	0.0	0.8	4.0	3.6	1.8	4.5
IVb. Self-employed without employees	0.4	3.1	2.9	6.9	8.5	8.5
IVc. Farmers	0.4	0.6	0.3	-	-	0.3
V. Lower-grade technicians, supervisors of manual workers	4.9	4.3	0.9	-	0.3	0.7
Working class						
VI. Skilled manual workers	23.0	21.4	15.4	16.3	17.4	15.8
VIIa. Unskilled manual workers (not in agriculture)	24.4	22.4	24.9	26.0	21.6	14.3
VIIb. Unskilled manual workers in agriculture	6.5	5.8	3.7	4.7	4.5	1.2

Source: Authors' calculations (based on surveys described in the Annex)

6.5 Intergenerational social mobility

Social mobility is understood here as vertical social mobility, i.e. moves between different social classes. As such, it refers to the degree of rigidity of the social stratification system and the (non)existence of structural barriers between social classes. It allows us to quantify and compare life chances of people with

various socioeconomic backgrounds. Intergenerational social mobility is related to the relationship between the position of parents and the position of their children in their adulthood. In general, if the relationship is weak, the stratification system is open and persons from different classes do have similar chances to fill the same positions. On the other hand, the strong relationship implies the existence of solid barriers between classes and significant inequality of opportunities (Džambazovič, Gerbery 2018).

Such understanding of social mobility is referred to as "relative mobility" or "social fluidity". It is based on the comparison of life chances of persons with different class backgrounds to reach a given class destination and not another (Breen 2004). Statistically speaking, it is conceptualised in terms of odds ratios in a mobility table. Contrary to this, "absolute mobility" is concerned with patterns and rates of mobility, without taking into consideration the comparison of chances. Absolute social mobility relates to structural changes in class structure. It allows us to quantify the amount of upward and downward movements along the stratification ladder (in comparison to their parents).

The analysis of intergenerational social mobility is based on an intergenerational table that includes two variables: class position of parent and class position of child. In the majority of social mobility studies, attention was paid to the relationships between men and their sons. The argument was that when focusing on the mobility of men, difficulties with the interpretation of specificities of careers of men and women are removed. This step is justified, as the arguments go, in light of empirical findings showing that differences between the results of men's mobility analyses on the one hand and analyses of men and women's mobility on the other hand are small (Erikson, Goldthorpe 1992). Nevertheless, since 1980s research into social mobility has paid systematic attention to the social mobility of women, addressing profound changes in the labour markets of Western developed countries, focus on the relationship between the positions of fathers and sons has been expanded by taking into account the relationship between the positions of mothers and daughters. In our study we will employ a similar strategy, i.e. we will analyse the mobility of men and women separately in order to identify gender-specific patterns of social mobility.

Social mobility research has a rich tradition of comparative analyses, which have contributed to the understanding of mobility trends and patterns and their cross-country variability. They show that class structures in developed European countries are becoming more similar, although differences in relative chances still persist (Džambazovič, Gerbery 2018). Differences regarding social mobility regimes also persist among post-socialist European countries. From a historical perspective, socialist countries experienced the peak in absolute mobility in the

1950s and somewhat later they also reached the peak in relative mobility. Then, however, the class structure became more rigid. In addition, the socioeconomic transition in the 1990s was accompanied by further weakening of its openness (see, for example, Katrňák, Fónadová 2014; Katrňák, Fučík 2010; Róbert, Bukodi 2004). These findings give rise to questions as to what kind of mobility regime emerged in Slovakia. We will answer this question by examining data from the "Survey on Social Stratification and Social Mobility in Slovakia" from 2016, which was carried out by the Department of Sociology at Comenius University in Bratislava (its characteristics are briefly described in the Annex). In the next part we will examine absolute and relative social mobility in terms of the ESeC scheme, which appears to be more suitable for our analytical purposes (Džambazovič, Gerbery 2018). Furthermore, we will test some hypotheses about the form of relative social mobility by applying log-linear modelling techniques to intergenerational mobility tables. As mentioned above, all analyses will be carried out separately for men and women.

6.5.1 Absolute mobility

Absolute mobility refers to movements between the class of origin (parents' class) and the current class (class of respondent). Sometimes it is referred to as movements between class origin and destination. Absolute mobility captures changes in the structure of occupations across time, reflecting structural changes in the economy (Eurofound 2017: 7). It can reveal whether upgrading of the social structure occurred (moving to fewer low-level classes and more to medium- or high-level classes) or there were other trends (stability, downgrading of structure).

In one of the previous parts of the chapter we have argued that the class structure in Slovakia changed due to three macrosocial shifts. Now we will examine these changes from an intergenerational perspective, drawing attention to changes between parents' class and the class of respondents. These changes can be identified by comparing marginal distributions in the mobility table (where each respondent is allocated to a cell according to his/her own class position and the class position of his/her family). It means comparing the relative size of classes in the parents' generation and the current generation in the labour market. It is worth noting that this comparison differs from the comparison in Table 3. It does not examine the class structure in single years but it shows how current labour market participants differ from their parents. In order to extend the evidence on long-term trends in social stratification, as provided in the previous part, we em-

ploy the EGP and ESeC schemes. Later, when analysing specific patterns of absolute and relative mobility we switch to the ESeC scheme with six classes.

Tables 6.5 and 6.6 show a clear trend in terms of both the EGP and the ESeC scheme. According to the EGP scheme, men experienced an expansion of the lower part of the service class (an increase by 6.9 percentage points), self-employment (9.6 p.p.) and routine non-manual occupations (8.9 p.p.). On the other hand, skilled and unskilled manual occupations lost their weight. The picture is similar for women, with few exceptions. There is an increase in the relevance of the higher part of the service class, a less significant fall in the size of skilled manual workers, and a more significant decrease in the proportion of unskilled manual workers.

Examining intergenerational shifts from the perspective of the ESeC scheme, we arrive at similar conclusions. Higher- and medium-level classes (salariat, higher-grade white and blue workers, small employers, and self-employed) expanded and the working class shrank. The growth of small employers and the self-employed (petit bourgeoisie) represents the most significant change between two generations. Differences between men and women are similar to those identified within the EGP scheme. Men show a greater increase in the proportion of small employers and the self-employed and a greater decline of the proportion of skilled manual workers. Women experienced a more significant increase in the size of the highest class (salariat) and a more significant decrease in the size of the lowest class (semi- and non-skilled workers).

The trend is clear: there has been a significant upgrade of the current class structure as compared to the class structure of parents' generation. However, we must admit that this kind of comparison should be treated with caution. As Breen (2004: 19) points out, the problem is that the data for mobility analyses are usually drawn from surveys which have a retrospective design. "So while the destination distribution represents the class structure of a given country at the time that survey was conducted, the origin distribution doesn't represent that structure at any given earlier point in time." However, Breen argues, "there is no doubt that comparisons between the origin and destination distributions do reflect, albeit imperfectly, historical change in the class structure".

Table 6.5:
Changes in relative size of EGP classes from intergenerational perspective (p.p.)

	Change "fathers–sons"	Change "mothers–daughters"
I. Large proprietors; higher-grade professionals, administrators, and officials; managers in large firms	-1.3	+2.6
II. Lower-grade professionals, administrators, and officials; higher-grade technicians; managers in small firms; supervisors of non-manual employees	+6.9	+4.5
IIIa+b. Routine non-manual workers	+8.9	+4.6
IVa. Self-employed with employees	+3.4	+2.9
IVb. Self-employed without employees	+6.2	+5.7
IVc. Farmers	-0.1	-0.2
V. Lower-grade technicians, supervisors of manual workers	+1.1	-0.2
VI. Skilled manual workers	-13.5	-5.8
VIIa. Unskilled manual workers (not in agriculture)	-5.1	-5.6
VIIb. Unskilled manual workers in agriculture	-6.5	-8.3

Note: The table compares the proportions of classes in the parents' generation and in the current labour force, expressed in percentage points.
Source: Authors' calculations from *Survey on Social Stratification and Social Mobility in Slovakia* (2016)

Table 6.6:
Changes in relative size of ESeC classes from intergenerational perspective (p.p.)

	Change "fathers–sons"	Change "mothers–daughters"
1. Higher salariat	+0.1	+2.7
2. Lower salariat	+1.2	+1.2
3. Higher-grade white-collar workers	+1.1	-1.6
4. Petit bourgeoisie	+12.8	+8.7
5. Petit bourgeoisie in agriculture	0.0	-0.4
6. Higher-grade blue-collar workers	+1.3	+0.4
7. Lower white collars	-5.9	+5.6
8. Skilled workers	-17.5	-8.0
9. Semi- and non-skilled workers	-5.0	-8.5

Note: The table compares the proportions of classes in the parents' generation and in the current labour force, expressed in percentage points.
Source: Authors' calculations from *Survey on Social Stratification and Social Mobility in Slovakia* (2016)

The comparison of origin and destination distributions can be supplemented by a description of outflow and inflow mobility. *Outflow mobility* indicates what

share of people originating in a particular class is found in other classes of destinations. It offers an answer to the question "Where?". *Inflow mobility* shows the distribution of respondents of various origins within each class of destination. It answers the question "From where?". While outflow mobility indicates the strength of the relationship between an origin and destination, inflow mobility captures the degree of homogeneity of each class destination in terms of the class origin of its members (Katrňák 2005).

Table 6.7 shows the outflow and inflow mobility for men. The salariat, as the highest-level class, shows a high degree of reproduction/immobility. In terms of outflow mobility, 43.4% of respondents whose parents belong to the salariat can be found in the same class. Other classes seem to be less likely destinations. For example, almost 11% of men who come from the salariat belong to the class of intermediate workers. Approximately 9% of men who come from the salariat belong to the lower white-collar class. Attention should also be paid to the fact that the class of skilled workers represents the second most frequent class destination for persons who come from the salariat (13.9%). It indicates that, apart from strong reproduction bias, people rooted in the salariat tend to end up in more distant classes.

Adjacent classes — intermediate workers and small entrepreneurs — exhibit different patterns of outflow mobility. The degree of immobility of intermediate workers represents 17%; in the case of small entrepreneurs it is 18%. But while the most frequent destination for persons who come from the class of intermediate workers is the salariat, people from the class of small entrepreneurs tend to end up in the lowest class. At the other end of the ESeC scheme, skilled workers and semi- and non-skilled workers show a higher degree of reproduction. Twenty-seven point one per cent of men whose parents are skilled workers belong to the same class. Similarly, 26% of men from the lowest class remain in the same class position.

In terms of inflow mobility, the salariat class mainly consists of people who come from the salariat (38.8%). In contrast, the adjacent classes of intermediate workers and small entrepreneurs are biased towards lower social classes. Approximately half of the intermediate workers come from the class of skilled workers or the class of semi- and non-skilled workers. This proportion is even higher for small entrepreneurs (68.4%). In the case of other classes, it could be expected that the majority of their members have roots in the lower part of the social stratification system.

According to Breen (2004: 18), classes that are expanding will be diverse in the class origins of their members. Declining classes tend to have a large share of

their members with origins in that same class. Our data confirm this hypothesis, with the exception of the service class.

Table 6.7:
Outflow and inflow intergenerational mobility within ESeC scheme with six classes: fathers (rows) and sons (columns)

Outflow mobility							
	I	**II**	**III**	**IV**	**V**	**VI**	TOTAL
I	*43.4*	10.6	13.9	9.3	13.9	8.9	100.0
II	33.0	*17.0*	15.9	18.2	5.7	10.2	100.0
III	17.8	17.8	*17.8*	15.6	11.1	20.0	100.0
IV	24.7	10.3	10.3	*11.3*	13.4	29.9	100.0
V	14.5	6.1	16.5	11.3	*27.1*	24.7	100.0
VI	14.7	7.6	15.2	13.6	22.6	*26.0*	100.0
SPOLU	22.0	8.6	15.3	12.1	20.7	21.3	100.0
Inflow mobility							
	I	**II**	**III**	**IV**	**V**	**VI**	TOTAL
I	*38.8*	24.2	17.9	15.1	13.2	8.3	19.7
II	8.6	*11.4*	6.0	8.6	1.6	2.8	5.7
III	2.4	6.1	*3.4*	3.8	1.6	2.8	2.9
IV	7.1	7.6	4.3	*5.9*	4.1	8.9	6.3
V	25.4	27.3	41.9	36.2	*50.6*	45.0	38.8
VI	17.8	23.5	26.5	30.3	28.9	*32.4*	26.5
SPOLU	100.0	100.0	100.0	100.0	100.0	100.0	100.0

I = Salariat, II = Intermediate workers, III = Small employers and self-employed, IV = Lower white collars, V = Skilled workers, VI = Semi- and non-skilled workers
Source: Džambazovič, Gerbery (2018)

Outflow and inflow mobility of women show quite different patterns. Although members of the salariat show the highest degree of immobility, their outflow percentages are more heterogeneous than the outflow distribution of men. A stronger tendency towards class reproduction can be found among women from the class of lower white collars and semi- and non-skilled manual workers. Moreover, it seems that some barriers between distant classes are not very solid for women. More than one fifth of persons whose mothers belong to non-skilled workers end up in the salariat. Similar holds true for women from the class of skilled workers.

Examining inflow mobility, there are two classes that attract women with the same class background: salariat (29%) and semi- and non-skilled manual workers (41%). Here, the hypothesis regarding the structure of expanding and diminishing classes has been proven to a certain extent.

Table 6.8:
Outflow and inflow intergenerational mobility within ESeC scheme with six classes: mothers (rows) and daughters (columns)

Outflow mobility							
	I	**II**	**III**	**IV**	**V**	**VI**	TOTAL
I	*35.6*	19.3	11.5	22.4	2.4	8.8	100.0
II	37.4	*12.8*	11.8	21.4	3.7	12.8	100.0
III	42.9	14.3	*14.3*	21.4	0.0	7.1	100.0
IV	25.0	12.9	10.0	*31.3*	3.3	17.5	100.0
V	23.4	12.3	6.4	25.1	*6.4*	26.3	100.0
VI	22.6	12.8	7.5	25.3	5.0	*26.7*	100.0
SPOLU	28.6	14.3	9.5	25.1	4.0	18.5	100.0
Inflow mobility							
	I	**II**	**III**	**IV**	**V**	**VI**	TOTAL
I	*29.0*	31.5	28.3	20.8	13.7	11.1	23.3
II	19.3	*13.3*	18.3	12.6	13.7	10.3	14.8
III	1.7	1.1	*1.7*	0.9	0.0	0.4	1.1
IV	16.6	17.1	20.0	*23.6*	15.7	17.9	19.0
V	11.1	11.6	9.2	13.5	*21.6*	19.2	13.5
VI	22.4	25.4	22.5	28.6	35.3	*41.0*	28.4
SPOLU	100.0	100.0	100.0	100.0	100.0	100.0	100.0

I = Salariat, II = Intermediate workers, III = Small employers and self-employed, IV = Lower white collars, V = Skilled workers, VI = Semi- and non-skilled workers
Source: Džambazovič, Gerbery (2018)

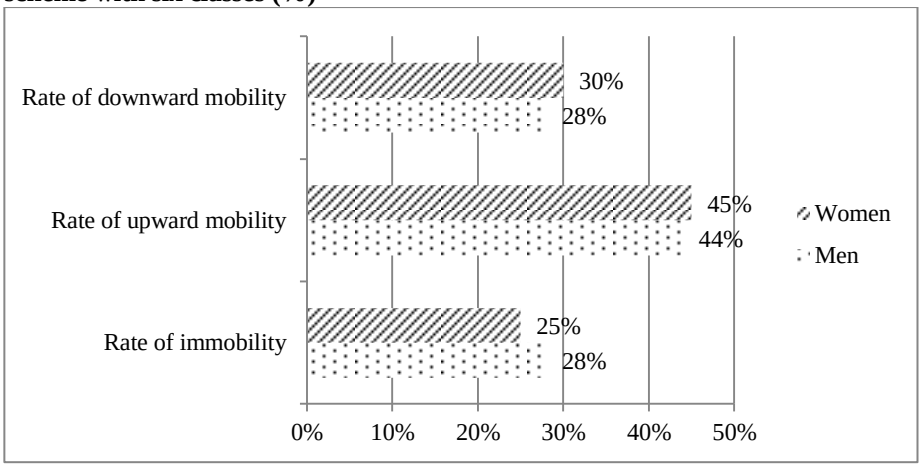
Information on structural shifts across generations and outflow and inflow mobility must be combined with aggregated indicators on overall absolute mobility which summarise all movements in the mobility table by few values. As Figure 6.2 shows, upward mobility was the most frequent type of mobility that the population in the current labour market experienced. Forty-five per cent of men and 44% of women in the current labour market increased their class position as compared with their parents. Slightly more men (30%) than women (28%) went in the opposite direction. On the other hand, women showed a higher rate of reproduction of the class position. A large part of upward mobility (more than 70%) represented so-called "longer" mobility, i.e. movement across more than one class (people who moved to an adjacent class were not included).[89] To sum up, it seems that as upper parts of the class structure became larger, they were often filled by people from lower classes.

It should be noted that values of the absolute mobility indicators heavily depend on the type of mobility table and the class scheme that was used. We rely on the ESeC scheme with six classes and the above-mentioned values relate only to this mobility table. Using a mobility table with more classes (7, 11) would

[89] "Longer" mobility also prevails among people who experienced downward mobility but its proportion is lower (50% of men, 65% of women).

lead to different estimations (a larger table with more cells allows computing more movements between class positions, and vice versa).

Figure 6.2:
Indicators of absolute intergenerational mobility for men and women – ESeC scheme with six classes (%)



Source: Džambazovič, Gerbery (2018)

6.5.2 Relative mobility

A general "upgrade" of the class structure (expansion of upper classes and contraction of lower classes) does not necessarily lead to increasing mobility chances. Chances to access (newly created) positions in the class structure may differ markedly according to the socioeconomic background. Therefore, the following question arises: "How much difference is there between people coming from different origin classes in their chances of occupying a place in one destination class rather than another?" (Breen 2004: 20). To answer the question, we must turn to relative mobility.

Relative mobility, also known as social fluidity, refers to a class structure's degree of rigidity, or degree of societal openness. It is based on the comparison of chances of individuals of different classes of origins being found in different classes of destinations, putting aside the effects of structural change (Goldthorpe 2016: 96). Relative mobility is measured by odds ratios, which can be calculated from a mobility table or can be obtained by modelling the relationship of origin and destination variables. Odds ratios represent the measure of association be-

tween two variables, which is invariant to marginal frequencies of the contingency table. For a 2x2 contingency table consisting of variables *a* and *b*, the odds ratio takes the following form:

$$\text{odds ratio} = (f_{11} / f_{12}) / (f_{21} / f_{22}),$$

where *f* stands for frequency.

Here, the odds ratio expresses the chance of a person originating in class *1* being found in class *1* rather than in class *2* (f_{11} / f_{12}) relative to the chance of a person originating in class *b* being found in class *a* rather than *b* (f_{21} / f_{22}). For a contingency (mobility) table with I rows and J columns, we can calculate (I-1) (J-1) non-redundant odds ratios for 2x2 sub-tables for pairs of adjacent rows and columns of the full table (Hout 1983: 16). The odds ratio can be expressed in a more general form:

$$\text{odds ratio} = f_{ij} f_{i+1, j+1} / f_{i, j+1} f_{i+1, j}.$$

In the case of perfect mobility (no association between the origin and destination), the odds ratio is equal to 1. The greater the deviation from 1, the more unequal the relative chances.

As we rely on a mobility table with six classes (table 6x6), 25 non-redundant odds ratios can be calculated. It is clear that 25 values represent a complexity that is too demanding for a systematic interpretation. This problem is usually solved by specifying a statistical model (log-linear models) of the full set of independent odds ratios or the overall association (Breen 2004: 21). Here, we will describe briefly some odds ratios from the mobility table (separately for men and women) — in order to demonstrate their usefulness as well as point out theoretically important issues — and then we will proceed to log-linear models.

Table 6.9 shows odds ratios for adjacent classes in the mobility table for men. We would like to draw attention to two findings. Firstly, the table confirms previous indications that the class of the salariat shows a significant degree of immobility/reproduction. The odds ratio for the first two classes (the chances of men originating from the salariat becoming a member of the salariat and not the intermediate occupations class relative to the chances of men from the intermediate occupations class) is equal to 2.1. It means that the chances of men from the salariat becoming a member of this class are two times higher than the chances of men from a lower adjacent class. Secondly, the chances to move to the salariat (and not to the intermediate occupations class) are significantly higher for men from the intermediate occupations class than for men from the class of small entrepreneurs (odds ratio is equal to 1.9).

Table 6.9:
Odds ratios for mobility table ESeC with six classes: fathers–sons

Fathers	Sons				
	I:II	II:III	III:IV	IV:V	V:VI
I:II	2.1	0.5	1.7	0.2	2.8
II:III	1.9	1.1	0.8	2.3	1.0
III:IV	0.4	1.0	1.3	1.7	1.2
IV:V	1.0	2.7	0.6	2.0	0.4
V:VI	1.2	0.7	1.3	2.1	1.3

I = Salariat, II = Intermediate workers, III = Small employers and self-employed, IV = Lower white collars, V = Skilled workers, VI = Semi- and non-skilled workers
Source: Džambazovič, Gerbery (2018)

Table 6.10 describes 25 odds ratios in the mobility table for women. It is clear that distributions of relative chances of men and women differ. In general, women's odds ratios are less heterogeneous. Furthermore, the salariat is open to women from adjacent classes. Two indicators confirm this fact. Firstly, the chances of women from the salariat being found in the same class are lower than the chances of women from the intermediate occupations moving to the salariat. Secondly, women who come from the intermediate occupations and women from the class of small entrepreneurs have the same chances to move to the salariat. Attention should also be paid to the fact that women from the lowest classes have similar chances to move to the salariat.

Table 6.10:
Odds ratios for mobility table ESeC with six classes: mothers–daughters

Mothers	Daughters				
	I:II	II:III	III:IV	IV:V	V:VI
I:II	0.6	1.5	1.0	1.7	0.9
II:III	1.0	1.1	0.8	n.a.	n.a.
III:IV	1.6	0.8	2.1	n.a.	n.a.
IV:V	1.0	0.7	1.3	2.4	0.8
V:VI	1.1	1.1	0.9	0.8	1.3

I = Salariat, II = Intermediate workers, III = Small employers and self-employed, IV = Lower white collars, V = Skilled workers, VI = Semi- and non-skilled workers
Source: Džambazovič, Gerbery (2018)

As mentioned above, the interpretation of all odds ratios from mobility tables is limited by the complexity of the relationships and, simply, by the number of values. In the case of mobility tables with several classes, log-liner modelling represents a more appropriate analytical strategy. The association between origins and destinations is modelled through interactions (between origins and destinations) or association parameters. Log-linear modelling does not work with a standard "dependent variable". Instead of a dependent variable, (expected) frequency in the cells of the mobility table is on the left side of the equation. For

the mobility table with *I* rows (origins) and *J* columns (destinations) we define the logarithm of the expected frequency in each cell of the table in the following way:

$$\log (F_{ij}) = \lambda + \lambda_i^O + \lambda_j^D + \lambda_{ij}^{OD}$$

$$(\text{for all } i = 1, ...I; j = 1, \ldots J),$$

where λ is a constant term, λ^O and λ^D represent the row and column main effects, and λ^{OD} is a set of interaction parameters. Interactions are at the heart of the building of social fluidity models because they capture the association between rows and columns.[90] They are functions of the odds ratios in the mobility table.

The analytical strategy is based on searching for the parsimonious model which embodies theoretical considerations regarding the pattern of the relationship between the class of origin and the class of destination and which has a good fit to data. Theoretical hypotheses often relate to the form of the relationship and its components or to theoretically grounded assumptions regarding the nature of the relationship in various categories of the third variable (e.g. when we compare the association between origins and destinations in different age cohorts). Searching for a parsimonious model means that we would like to have the model that fits fewer than *I* x *J* parameters (which reproduce cell frequencies exactly) and reproduces the observed cell counts adequately. There are (*I* - 1) x (*J* - 1) possible parameters which can be used to express the association in the table.

Several measures are usually used to check the goodness of fit of the model. The index of dissimilarity (Δ) compares the observed frequencies (f_{ij}) with the frequencies expected under the model (F_{ij}). It indicates the proportion of cases that are misclassified, i.e. the percentage of cases that would have to be reclassified in order to make the two distributions identical. It is calculated according to the following formula:

$$\Delta = \frac{1}{2N_{ij}} \sum_{i=1}^{I} \sum_{j=1}^{J} |f_{ij} - F_{ij}|.$$

Pearson's x^2 and G^2 belong to the most used goodness-of-fit statistics (von Eye, Mun 2013: 25). They are used for two purposes. Firstly, they indicate the fit of the model by measuring the distance between the observed distribution and the distribution that the model proposes: the larger values of x^2 and G^2, the big-

[90] Row and column main effects ensure that the marginal totals estimated by the model exactly match the observed marginal totals (Breen 2004: 22).

ger the difference between the observed and fitted values. Secondly, they serve as tools of statistical inference. They take the following forms:

$$x^2 = 2\ \sum_{i=1}^{I}\sum_{j=1}^{J}\frac{(f_{ij} - F_{ij})^2}{F_{ij}}; \qquad G^2 = 2\ \sum_{i=1}^{I}\sum_{j=1}^{J} f_{ij}\log\frac{f_{ij}}{F_{ij}}.$$

The choice of the model(s) is also often guided by information criteria which are based on the idea of parsimony (von Eye, Mun 2013: 32). The Akaike information criterion and the Bayesian criterion belong to the most popular and widely used tools. They refer to the amount of information provided by the model. Models containing more information are more suitable for interpretation. When choosing among models, we focus on models that minimise their values. Information criteria are defined as follows:

$$\text{AIC} = G^2 - 2\,df$$

$$\text{BIC} = G^2 - df\log N,$$

where *df* stands for degrees of freedom and *N* for the size of the sample.

In order to explore the association between an origin and destination, various models, which contain various assumptions about interaction parameters in various parts of the mobility table, can be developed. Our aim here is not to provide a systematic test of all relevant theoretical ideas about the nature of social mobility in Slovakia but to demonstrate the usefulness of log-linear modelling for its understanding. To do so we test several log-linear models using data from the "Survey on Social Stratification and Social Mobility in Slovakia" and the ESeC scheme with six classes. We will start with the simplest model and then proceed with the models that incorporate more assumptions. Relying on the analytical strategy described above, we will try to find parsimonious models with a good data fit. Models' assumptions regarding interaction effects will be demonstrated by design matrices (and not by equations) in order to make assumptions as well as differences between models as clear as possible. Values in design matrices show interaction parameters (capturing the relationship between destinations and origins) or the lack thereof (zero values).

The simplest (and theoretically least relevant) model is represented by the independence model. As the name already suggests, it is based on the assumption that there is no relationship between the origin and destination. It serves as a basis against which other models are compared. (In order to evaluate their "contribution" we will employ goodness-of-fit criteria.) The quasi-perfect mobility model (sometimes called the quasi-independence model) assumes independence everywhere, except for the diagonal. The reason is that the main diagonal cells often contribute significantly to the poor fit of independence model due to a

strong inheritance effect (Powers, Xie 1999: 115). The pattern assumed by the quasi-perfect mobility model is the result of two processes (Hout 1983: 19). The first process allocates part of the population to destinations that are the same as their origins. It results in immobility. The second process allocates the rest of the population to destinations without regard to the class origin (which means that some persons are allocated to destinations that are identical to their origins by mechanism of perfect mobility, i.e. by chance). We distinguish two types of quasi-perfect mobility models. The first model (QPM) assigns unique parameters (interaction effects) to the different main diagonal cells, assuming that they differ with respect to the nature of the inheritance/reproduction effect. The second model (QPM-C) relies on the difference between the two processes of immobility and mobility but it specifies a single parameter for all main diagonal cells (i.e. it supposes that there is the same inheritance effect on the main diagonal).

Quasi-perfect mobility	**Quasi-perfect mobility constrained**
1 0 0 0 0 0	1 0 0 0 0 0
0 2 0 0 0 0	0 1 0 0 0 0
0 0 3 0 0 0	0 0 1 0 0 0
0 0 0 4 0 0	0 0 0 1 0 0
0 0 0 0 5 0	0 0 0 0 1 0
0 0 0 0 0 6	0 0 0 0 0 1

On the basis of the quasi-perfect mobility models, other models can be developed by adding parameters to the minor diagonals above and below the main diagonal. The symmetrical diagonals-constrained model (SD-C) applies the same parameter to the two minor diagonals. The quasi-symmetrical diagonals-constrained model (QSD-C) does the same thing but it relies on the assumption of the QPM model regarding the main diagonal. Both models assume that there are two or more patterns of inheritance in the mobility table. Two other models further extend the assumptions by differentiating among various parameters on the minor diagonals. While the first modified model assumes that both minor diagonals contain the same set of the parameters, the second modified model identifies several subfields with the different interactions.

Symmetrical diagonals-constrained	**Quasi-symmetrical diagonals-constrained**
1 2 0 0 0 0	1 7 0 0 0 0
2 1 2 0 0 0	7 2 7 0 0 0
0 2 1 2 0 0	0 7 3 7 0 0
0 0 2 1 2 0	0 0 7 4 7 0
0 0 0 2 1 2	0 0 0 7 5 7
0 0 0 0 2 1	0 0 0 0 7 6

Quasi-symmetrical diagonals-modified I	Quasi-symmetrical diagonals-modified II
1 7 0 0 0 0	1 7 0 0 0 0
7 2 8 0 0 0	7 2 7 0 0 0
0 8 3 9 0 0	0 7 3 8 0 0
0 0 9 4 10 0	0 0 8 4 8 0
0 0 0 10 5 11	0 0 0 8 5 9
0 0 0 0 11 6	0 0 0 0 9 6

Furthermore, various versions of the topological model used to be tested in social mobility analyses. Here, cells are grouped into several levels or types, where all cells at the same level share a common parameter. Each cell at a given level is quasi-independent of other cells at that level, which means that the subsets are composed of cells between which mobility is easy in the sense that origins and destinations are independent conditional on the marginal distributions and the assignment of cells to the K levels (Hout 1983: 37–38). Establishing levels and assigning parameters should be a theoretically driven process, while at the same time reflecting identified patterns of mobility in a given country. The topological models that we test here rely on arguments regarding the presence of several subsets in the mobility table in Slovakia which differ with respect to the relationship between the origin and destination and, as such, represent different areas of immobility/mobility processes.

Topological model I	Topological model II
1 2 3 3 3 4	1 2 3 3 3 3
2 2 3 3 4 4	2 2 3 3 3 3
3 3 3 4 4 4	3 3 3 3 3 5
3 3 4 4 4 5	3 3 3 4 3 5
3 4 4 4 5 5	3 3 3 4 5 5
4 4 4 5 5 6	4 4 4 5 5 6

All models were applied to data for men and women. Table 6.11 provides information on key goodness-of-fit measures which will help us to assess the models for the men's mobility tables. Taking into account Pearson's x^2 and G2 (as well as degrees of freedom), the independence model does not represent the data's structure adequately. Information criteria confirm this conclusion. It is not surprising because the independence model usually serves as a baseline, and not a substantively relevant hypothesis. However, similar characteristics also apply for the quasi-perfect mobility model with constrained main diagonals. It indicates that the differences between the observed and fitted frequencies are too large and the amount of information included in the model is not as high as the amount of information in other models. On the other hand, the quasi-perfect

mobility model, the model of quasi-symmetrical diagonals-constrained, and the model of symmetrical diagonals-constrained show lower values of goodness-of-fit statistics. Information criteria confirm that these models are more suitable for data. But, taking into account p value of the x^2 test, all these models (including the independence model and the quasi-perfect mobility model) significantly differ from our data and must be rejected.[91]

There are four models that describe our data well and have low values of goodness-of-fit statistics: the two modified models of quasi-symmetrical diagonals and two topological models. They confirm that there are several areas in the mobility table for men which differ in respect of the relationship between the origin and destination. Some classes show a quite strong inheritance effect. More specifically, it seems that there are several patterns of inheritance in the mobility table (on the main and adjacent marginal diagonals). Furthermore, there are specific interactions in the corner of the table, suggesting a specific form of relationship at the top and bottom of the class hierarchy, as well as in its other parts. Generally speaking, there is social fluidity in Slovak society but it has various limitations, depending on the position within the class hierarchy. Similar conclusions apply for women.

[91] There are statistically significant discrepancies between the models and data.

Table 6.11:
Characteristics of log-linear models for ESeC 6x6 mobility table "fathers–sons"

	x^2 (sig.)	G^2 (sig.)	df	Δ	BIC	AIC
Independence model	191.5 (0.000)	189.3 (0.000)	25	0.14	5.9	139.3
Quasi-perfect mobility model	78.9 (0.000)	78.8 (0.000)	19	0.07	-60.6	40.8
Quasi-perfect mobility model constrained	116.5 (0.000)	117.6 (0.000)	24	0.11	-58.5	69.6
Model of symmetrical diagonals constrained	86.7 (0.000)	85.0 (0.000)	23	0.09	-83.7	39.2
Model of quasi-symmetrical diagonals constrained	59.3 (0.000)	61.1 (0.000)	18	0.07	-71.0	25.1
Model of quasi-symmetrical diagonals modified I	20.9 (0.102)	20.8 (0.107)	14	0.03	-81.9	-7.2
Model of quasi-symmetrical diagonals modified II	25.8 (0.06)	26.2 (0.06)	16	0.04	-91.2	-5.8
Topological model I	28.5 (0.07)	29.2 (0.06)	19	0.04	-110.2	-8.8
Topological model II	28.8 (0.07)	28.7 (0.07)	19	0.04	-110.7	-9.3

Source: Authors' calculations from Survey on Social Stratification and Social Mobility in Slovakia (2016)

Table 6.12:
Characteristics of log-linear models for ESeC 6x6 mobility table "mothers–daughters"

	x^2 (sig.)	G^2 (sig.)	df	Δ	BIC	AIC
Independence model	81.1 (0.000)	82.7 (0.000)	25	0.11	-65.9	33.0
Quasi-perfect mobility model	49.6 (0.000)	48.5 (0.000)	19	0.07	-87.2	10.5
Quasi-perfect mobility model constrained	59.0 (0.000)	59.5 (0.000)	23	0.08	-104.8	13.5
Model of symmetrical diagonals constrained	32.5 (0.000)	33.4 (0.000)	23	0.06	-113.9	-12.6
Model of quasi-symmetrical diagonals constrained	26.8 (0.000)	26.6 (0.000)	18	0.04	-101.9	-9.3
Model of quasi-symmetrical diagonals modified I	14.1 (0.445)	14.2 (0.433)	14	0.03	-65.8	-13.8
Model of quasi-symmetrical diagonals modified II	15.7 (0.335)	15.4 (0.353)	14	0.03	-84.6	-12.6
Topological model I	28.0 (0.08)	26.6 (0.07)	19	0.05	-107.1	-9.4
Topological model II	28.9 (0.07)	28.6 (0.06)	19	0.04	-110.7	-9.4

Source: Authors' calculations from Survey on Social Stratification and Social Mobility in Slovakia (2016)

6.6 Conclusions

The aim of the chapter was to contribute to discussions surrounding social inequality and life chances. We have shown that the class structure in Slovakia has changed significantly over the last decades. New positions in its upper parts emerged, both for men and for women. A large proportion of the current population in the labour market experienced upward absolute mobility. Moreover, approximately 70% of these people (both men and women) experienced a significant improvement of the class position. On the other hand, 30% of men and 28% of women faced downward mobility. In sum, the "upgrade" of the class structure occurred between generations, opening opportunities in the upper parts of the ladder.

Data on relative mobility show, however, that chances to fill in these positions are not distributed equally. The idea of equal opportunities remains far from being a reality. There are clusters within the social stratifications which show a higher degree of reproduction and closeness towards persons with different class origins. Social fluidity takes several forms, depending on the position in the class structure.

Models and calculations presented in the chapter serve as an example of how to address the issue of unequal life chances and performance of "the social mobility engine". Starting from theoretical arguments regarding the nature of inequality and its economic roots, attention has been paid to categorical schemes that establish matrices of positions that are then applied to a given society. Of great importance is establishing a solid theoretical basis for using log-linear models as tools of social fluidity analyses. In addition to few models that were shown here, there are some others which should be applied to our conditions. However, their development requires more theoretical effort as well as the collection of convincing empirical evidence on social inequalities that would allow formulating a set of hypotheses about barriers and forms of inequality reproduction. Such a set of theoretically as well as empirically driven arguments is a necessary basis for comprehensive, multi-tier topological models which might reveal deeper structural processes behind the scene.

6.7 Appendix

Table 6.13:

List of empirical surveys used for analysis of development of class-based stratification in Slovakia

Name of survey	Period of data collection	Authors	Data collection info
Social Stratification in Eastern Europe after 1989[92]	March 1993	I. Szelényi, D.J. Treiman University of California, Los Angeles	Institution: Methodical and Research Department, The Slovak Radio Sample: Two-stage stratified sampling Sample size: 4953 respondents
ISSP Social Inequalities 2001	September 2001	Institute of Sociology, Slovak Academy of Science	Institution: Institute for Public Opinion Research, Statistical Office Sample: Quota sampling Sample size: 1082 respondents
ISSP in Slovakia 2006-2008	October 2008	Institute of Sociology (Slovak Academy of Science) and Department of Sociology (Faculty of Arts, Comenius University in Bratislava)	Institution: FOCUS Sample: Multistage stratified sampling Sample size: 1138 respondents
ISSP Slovakia 2012	October–December 2012	Institute of Sociology (Slovak Academy of Science), Department of Sociology (Faculty of Arts, Comenius University), Faculty of Social and Economic Sciences, Comenius University in Bratislava)	Institution: TNS Slovakia Sample: Multistage stratified sampling Sample size: 1128 respondents
Social Stratification and Social Mobility in Slovakia 2016	October–December 2016	Department of Sociology (Faculty of Arts, Comenius University in Bratislava)	Institution: MEDIAN SK Sample: Multistage stratified sampling Sample size: 3500 respondents

[92] Social class membership in 1988 was identified by retrospective questions.

7 SHORT-TERM FORECASTS OF UNEPLOYMENT RATE AND THEIR PRECISION

Eva Rublíková, Katarína Karasová

7.1 Introduction

From April 2012, The Institute for Forecasting, Centre of Social and Psychological Sciences of the Slovak Academy of Sciences (2012-2018) in Bratislava started to publish a bulletin of short-term forecasts for important indicators concerning the labour market in Slovakia in order to share knowledge about their development. Short-term forecasts, with the horizon of six time periods ahead, are computed by means of statistical methods from two different sources of data.

Monthly time series (the registered and the disposable number of unemployed, the registered and the disposable rate of unemployment, the number of job vacancies and the number of employed foreigners) are taken from the Central Office of Labour, Social Affairs and Family (2018) and their forecast are created by means of the Box-Jenkins methodology.

Quarterly time series (the rate of unemployment and the number of unemployed given by gender, the rate of employment 20-64 and the number of employed 20-64 given by gender, the number of job vacancies) are taken from the Slovak Statistical Office of Slovakia and their forecasts are computed by means of the Brown linear exponential smoothing combined with the method of multiplicative seasonal decomposition. Mentioned methods were briefly described in the monograph Lubyová et al. (2015).

Behind all our efforts in modelling and having developed extrapolative forecasts of mentioned variables, our experience showed mixed precision of ex-ante forecasts, which were created for the horizon of six months or six quarters ahead, from the last observation in the series. For this reason, we would like to answer several questions regarding the source of variability in forecast errors.

In a practical sense, forecasts must always be evaluated before the outcome of the forecasted variable is known. From this point of view, it is necessary to distinguish between ex-ante evaluation, when the forecast is developed before the actual value is known, and ex-post evaluation, performed after the outcome of variable has occurred and is known.

It is also important to distinguish between a quantitative and qualitative evolution of the accuracy of a forecast given by the statistical univariate time series analysis.

The quantitative evaluation is used to inform us, by means of statistical measures, how close the forecast came to describe the outcome of variable forecasted. On the other hand, the qualitative evaluation deals with the nonstatistical aspects directed toward the question of whether or not the correct model was chosen or about assumptions that were made and turned out to be incorrect.

Since we have used two different statistical techniques, the question of whether or not the chosen model is good for forecasting is based on two different approaches.

In monthly univariate time series, forecasting the source of variability in forecast errors could be hidden in the chosen model, because the ARIMA modelling used to offer several 'quite good' models (in a statistical sense) but with different extrapolative forecasts. This approach is based on the positive answers to the questions, whether:

- the time series is stationary and if not, whether the transformations to stationarity were taken properly
- the estimated parameters are statistical significant, fulfilling conditions of stationarity or invertibility
- the residuals are independent, homoscedastic and normally distributed
- the measures of residuals, like RMSE (standard deviation of residuals), MAE (mean absolute deviation of residuals), MAPE (mean absolute percentage error of residuals) and measures of bias ME (mean error) with MPE (mean percentage error) are small
- the development of the variable does not change dramatically in the future
- the model is simple, with few parameters.

Still, having the model chosen according to previous conditions, the decision to use this model for computing m - months ex-ante forecast for the time periods beyond the last observation could be only partially correct, because the residuals are only, at best, a measure of how well the model fits the data of the past. They do not answer the question of how well it fits future data. For this reason, statisticians used to solve this problem by making a distinction between ex-post sampling errors and ex-ante sampling errors. For the analyst, residuals are a measure of in-sampling errors (ex-post errors) with the horizon one period ahead, interpreted as the random deviation from the fitted model. For the forecaster, the real

source of forecast errors lies in the out-sampling errors (ex-ante errors), in problems such as having the wrong model or incorrect input data or choosing the horizon larger than one period ahead.

In quarterly univariate time series forecasting, the Brown linear exponential smoothing is used to the seasonally adjusted series given by the classical multiplicative decomposition. The source of variability in forecast errors could be hidden in the technique of seasonal adjustment (classical decomposition versus method X-11Q, ARIMA method or others) in the size of parameter of exponential smoothing - alpha and also in the length of horizon. There is no question about the suitability of fit, because we know only ex-post forecasts with one period ahead. The model is considered as good for forecasting purposes if the ex-post forecast errors with one period ahead are independent and their statistical measures, like RMSE, MAE, MAPE, MPE and ME, are close to zero.

The exponential smoothing and forecasting technique was developed for operating mode in industry, in which a forecast is updated with new data information (with every new quarter measurement), so we do not need to take the long horizon of ex-ante forecast because it is enough to make the forecast for one period ahead only. For this attribute of the exponential smoothing methodology, we will concentrate our analysis on the precision of 6-months ex-ante forecast making by Box-Jenkins methodology. We would like to concentrate only on the unemployment rate as the indicator that most represents the unemployment situation in the Slovak Republic. Its value is every 20th of the month, published by the Ministry of Labour, Social Affairs and Family.

The aim of this work is to answer several questions:

1. Is the precision of the out-of-sample (ex-post forecast) errors helpful in choosing a good forecasting model?
2. Is it possible to foresee the mean absolute percentage error of m – period ex-ante forecasts given by the mean absolute percentage error of m – period ex-post forecasts?
3. Is an analyst's selection of the forecasting model better than the statistical programme's automatic selection of the model?

7.2 Out of sample validation period

As was mentioned above, the model could be one of the reasons for the forecasts' bias. We are starting to analyse forecasting performance of ARIMA models by means of out-of-sample validation, because Box-Jenkins' methodology would offer several good ARIMA models from a statistical point of view, but

with various outcomes of forecasts. What does ‘out of sample validation period’ mean?

Assume we have time series y_t for t = 1, 2,..., T, T observations or the sample we would like to identify and to estimate several possible models. To test their forecasting performance, we can withhold from the time series m last observations and create an out-of-sample validation period. The sample of N = $T - m$ observations is also called the estimation period. This means that the model would be identified, estimated and tested by means of residuals on the sample N = $T - m$ observations.

In general, the data in the estimation period is used to help select the model and to estimate its parameters. The one-step-ahead forecasts made in the estimation period $\hat{y}_t$ for t = 1, 2, ..., N are usually called *fitted values*. (They are said to be ‘fitted’ because statistical software estimates the parameters of the model to ‘fit them as well as possible in a mean-squared-error sense). The corresponding one-step-ahead forecast errors are called *residuals*, $\hat{\varepsilon}_t = y_t - \hat{y}_t$ for t = 1, 2, ..., N.

The estimated model is regarded as a good model when its parameters are statistically significant and if its residuals are at least independent at a five per cent level of significance. Randomness of residuals are tested often by means of the Durbin-Watson statistics or by the autocorrelation function (Rublíková, 2007).

If there are several good models, the residual statistics (RMSE, MAE, MAPE, ME and MPE) are compared and the model with the smallest statistics is chosen and is regarded as the best. Another way to select the best model from the class of ARIMA models is the Akaike information criterion.

The best model is then used to compute m extrapolative ex-post forecasts, starting at the time t = N = T – m for the time period t = N + h = T– m + h with the horizon h = 1, 2, ..., m during the validation period. The m- ex post forecast errors $fe_h = y_{N+h} - \hat{y}_{N+h}$ for h = 1, 2, ..., m would then be evaluated by means of the mean measures like RMSEx-post, MAEx-post, MPEx-pos, MAPEx-post, MEex-post and MPEex-post computing in the validation period. If the data has not been badly overfitted, the ex-post forecast error measures in the validation period should be similar or slightly larger than those in the estimation period given by means of the RMSE, MAE, MPE and MAPE of residuals.

Because the data in the validation period is *held out* during parameter estimation, the forecasts made in this period are often called *backtests* or ex-post forecasts. Ideally, these are 'honest' forecasts and their error statistics are representative of errors that will be made in forecasting the future or making the ex-ante forecast with the same horizon h = 1., 2, ..., m started in the last observation T.

If we have the large time series, it is recommended to hold out at least 20 per cent of our data for validation purposes. The size m of the validation period should ideally be at least as large as the maximum forecast horizon required for computing future values for t = T + 1, T + 2, T + h for h = 1, 2, ..., m.

Holding data out for validation purposes is probably the single most important diagnostic test of a model: it gives the best indication of the accuracy that can be expected when forecasting the future.

7.3 Measuring forecast accuracy

Part of the decision to use a particular forecasting model must be based on our belief that, when implemented, the model will work reasonably well. It is unrealistic to expect a model to predict perfectly all the time but it is realistic to expect to find a model that produces relatively small ex-ante forecast errors. To judge a model quantitatively, there are several measures of forecast accuracy and their interpretation.

Assume time series y_t for t = 1, 2, ..., T where T is the number of observations of the series. Assume that N = T – m is the number of observations created in the sample estimation period in which we are looking for the good model with statistically significant parameters, independent, homoscedastic and normally distributed residuals and with their descriptive measures RMSE, MAE, MAPE, ME, MPE quite small. If all these criteria are fulfilled, the model is used to compute m – ex-post forecasts. Because we know these last m values of the time series, we can compute ex-post forecast errors:

$$fe_j = y_{N+j} - \hat{y}_j \text{ for } j = 1, 2, ..., m \qquad (1)$$

where y_{N+j} is real value of the series taken from the validation period

$\hat{y}_j$ is ex-post forecast in validation period

m is the number of observations in the validation period

Descriptive measures of ex-post forecast errors provide a single and easily interpreted measure of a model´s usefulness or reliability.

The ex-post mean absolute error measures forecast accuracy by averaging the magnitude of the ex-post forecast errors. The formula is:

$$MAEex-post = \frac{1}{m}\sum_{j=1}^{m}\left|y_{N+j} - \hat{y}_j\right| \tag{2}$$

MAEex-post is measured in the same units as the original series and can be easily interpreted.

The ex post RMSE forecast error (root mean square error of ex post forecasts) is very important criterion for model performance defined as:

$$RMSEex-post = \sqrt{\frac{1}{m}\sum_{j=1}^{m}(y_{N+j} - \hat{y}_j)^2} \tag{3}$$

To compare MAEex-post with RMSEex-post, we can see that RMSEex-post gives more weight to the large forecast errors. This is important, since a model that produces uniformly moderate errors may well be preferable to one that usually has smaller errors but occasionally yields unexpectedly large ones.

Mean absolute percentage ex-post forecast error MAPEex-post is defined as:

$$MAPEex-post = \frac{1}{m}\sum_{j=1}^{m}\frac{\left|y_{N+j} - \hat{y}_j\right|}{y_{N+j}}100\ \% \tag{4}$$

and gives us an indication of how large the forecast errors are in comparison to the actual values of the series. The last two measures are measures of bias that the model could perform in the future.

The mean ex-post forecast error is given by the formula:

$$MEex-post = \frac{1}{m}\sum_{j=1}^{m}\left(y_{N+j} - \hat{y}_j\right) \tag{5}$$

and used to inform us whether the model overestimates (underestimates) actual values. If MEex-post is of negative value, the model overestimates actual values and vice versa. The same interpretation is for the mean per cent ex-post forecast error, given relatively.

The mean percent MPEex-post error is defined as:

$$MPEex-post = \frac{1}{m}\sum_{i=1}^{m}\frac{y_i - \hat{y}_i}{y_i}\,100\ \% \tag{6}$$

Another useful criterion is Theil´s inequality coefficient, defined as:

$$U = \frac{\sqrt{\frac{1}{m}\sum_{j=1}^{m}(y_{N+j} - \hat{y}_j)^2}}{\sqrt{\frac{1}{m}\sum_{j=1}^{m} y_{N+j}^{\ 2}} + \sqrt{\frac{1}{m}\sum_{j=1}^{m} \hat{y}_j^{\ 2}}} \tag{7}$$

If U = 0, *the model forecasts perfectly*. The smaller the U, the better the forecasting performance of the model. If U = 1, the forecasting performance of the model is as bad as it possibly could be.

Theil also developed a simple decomposition of the MSEex-post into three components:

$$1 = \frac{(\bar{\hat{y}} - \bar{y})^2}{MSEex-post} + \frac{(s_{\hat{y}} - s_y)^2}{MSEex-post} + \frac{2(1-r)s_{\hat{y}}s_y}{MSEex-post} = U_M + U_V + U_C \tag{8}$$

each addressing a different aspect of forecast accuracy (Pindyck and Rubenfeld, 1981).

Each of the three components called U_M, U_V and U_C can be interpreted as a proportion or percentage of the MSEex-post error.

U_M (M stands for the difference in the means) measures the proportion of the MSEex-post caused by bias in the forecasting model (the means of the forecasts and actual values are different, because of some systematic error). For a good forecasting model, it is desirable to have $U_M = 0$. A large value of U_M (above 0,1 or 0,2) would be quite troubling, since it would mean that systematic bias is present and that revision of the model is necessary.

The variance proportion U_V (V stands for variance) indicates the ability of the model to replicate the degree of variability in the variable of interest. It is desirable to have $U_V = 0$. If U_V is large, it means that the actual values have fluctuated considerably, while the forecasted values show little fluctuation, or vice versa. Such a model is also troubling and might lead us to its revision.

The covariance proportion U_C measures unsystematic forecast errors; i.e. it represents the remaining error after deviations from average values and average variabilities have been noted. Since it is unreasonable to expect forecasts that are perfectly correlated with actual values, this component of error is less worrisome. The ideal distribution of inequality over the three sources is $U_M = U_V = 0$ and $U_C = 1$.

Note: Theil measures (7) and (8) are not used in this work. We mentioned them only because they were used in article (Rublíková, Karasová, 2018) with the result that 6 months ex-post forecasts were biased – the means of the ex-post forecasts and actual values were different. The value of U_M was large, which stands for systematic error of the model. We decided not to compute this proportion because error of bias is quite well expressed by formula (4) or (5).

When we are ready to forecast the future in real time, because we are satisfied with the ex- post forecast characteristics, then we use *all* the available data for estimation (whole time series with T observations), which means that the most recent data is used and the validation period is zero time periods.

Forecasts into the future are 'true' forecasts that are made for time periods beyond the end of the time series T for horizon h = 1, 2, ..., H, or for the observations in time periods T + 1, T + 2. ..., T + H. The ex-ante forecast errors $fe_{T+h} = y_{T+h} - \hat{y}_{T+h}$ for horizon h = 1, 2, ..., H time periods ahead may be evaluated only when real values are available. Remember that the ex-ante forecast errors are likely to be larger than the ex-post forecast errors.

Most forecasting software is capable of performing ex-ante forecasts automatically together with 95% confidence intervals. The 95% confidence interval is roughly equal to the forecast plus or minus two times the estimated standard deviation of the forecast error at each period. The confidence intervals typically *widen* as the forecast horizon increases, due to the expected build-up of error in the bootstrapping process: (first a one-period-ahead forecast is made, then the one-period-ahead forecast is treated as a data point and the model is cranked ahead to produce a two-period-ahead forecast, and so on, as far as we wish). The rate at which the confidence intervals widen is, in general, a function of the type of forecasting model selected.

7.4 Forecasting monthly unemployment rate by the user-specified ARIMA model

An important indicator of unemployment in Slovakia is the unemployment rate registered at the end of each month during the year: its values are published on the 20th next month. Our interest is focused upon preparing the forecasts as precisely as possible. We would like to analyse the precision of forecasts by means of 6-months ex-post forecast errors, using the best ARIMA model in rolling mode.

Time series is of the length T = 210 observations, from January 2001 until June 2018. The out-of-sample (validation) period is of the length m = 6 months, because we would like to construct extrapolative quasi ex-ante forecasts for the horizon of 6 months ahead, for January 2018 to June 2018, started in December 2017.

Our analysis will be conducted frequently for five estimation periods, always changed after extending data set by three new observations in line with their publishing by the Central Office of Labour, Social Affairs and Family of Slovakia. The ex-post forecasts will be computed in the validation period for m = 6 observations.

Table 7.1
Proposed time series for consecutive analysis

Time Series I	Number of obs. T_i	Estimation period-in- sample period N_i	Validation period for ex-post forecast m = 6	Ex-ante forecasting period H = 6
1	$T_1 = 198$	2001/M01-2016/M12	2017/M0-2017/M06	2017/M07-2017/M12
2	$T_2 = 201$	2001/M01-2017/M03	2017/M04-2017/M09	2017/M10-2018/M03
3	$T_3 = 204$	2001/M01-2017/M06	2017/M07-2017/M12	2018/M01-2018/M06
4	$T_4 = 207$	2001/M01-2017/M09	2017/M10-2018/M03	2018/M04-2018/M09
5	$T_5 = 210$	2001/M01-2017/M12	2018/M01-2018/M06	2018/M07-2018/M12

Source: Own suggestions

Because we have data, the ‘quasi’ ex-ante forecasts will be computed (the validation period will have zero observations) and descriptive measures of their errors will be compared together with the descriptive measures of ex-post forecast errors. We hope that the first three iterations of our analysis for the time series summarised in Table 7.1 would help us to know the precision of ex-ante forecasts that could be expected using the same model ARIMA.

How we will work? For each time series *i* with N_i observations, the model will be estimated and tested for statistical significance of its parameters and full-filling conditions for homoscedasticity by the F-test and normality by the Shapiro-Wilk test. Residuals of each model will be evaluated by descriptive measures to find the best model. This model will be used to compute 6-month ex- post forecast in the validation period and their descriptive mean measures will also be computed. Both mean measures for residuals and for ex-post forecast errors will be compared to see whether they are similar. If they are, the estimated model is regarded as a good model ARIMA and will be used for the whole sample T_i (using validation period with zero observations) to compute 6-months quasi ex-ante forecast. Quasi ex-ante forecast errors will be evaluated by means of descriptive mean measures.

We hope that the comparison of the descriptive mean measures of 6-months ex-post forecast errors and quasi 6-months ex-ante forecast errors for the first three models will not be too different.

Because we do not have more data, the precision of 'quasi' or exactly 6-months ex-ante forecasts for time series (5) and (6) could not be evaluated. For this series, the really ex-ante forecasts will be calculated. Their precision can be evaluated after they are known.

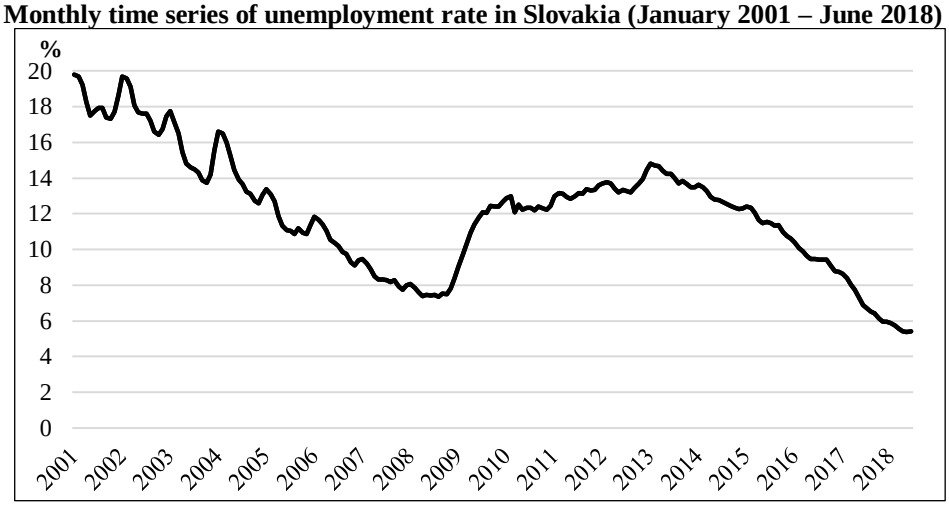
The question is whether only three iterations are enough to conclude that the chosen ARIMA model is/is not enough to say something about the precision of our model or methodology. The answer is that we could have longer time series from the example from January 2013, but because the trend from 2013 to 2016 is very similar to the trend from 2016 to 2018, we assume that the mean measures would not differ too much.

7.5 Results of the proposed analysis for the first three-time series of UR

The development of the unemployment rate (UR) in Slovakia from January 2001 to June 2018 is depicted in Figure 7.1. It is possible to see that the series is stochastic, nonstationary, and heteroscedastic, with stochastic seasonality, but from January 2013 there is a long-time decreasing trend to June 2018. Because the trend from January 2016 is similar to the trend from January 2013, we assume that the time period chosen for our analysis (January 2016 to June 2018) is enough to make conclusions about precision ex-ante forecasts of our models.

Before looking for some tentative model ARIMA, the series has to be transformed to stationary. Variance was stabilised by the logarithmic transformation.

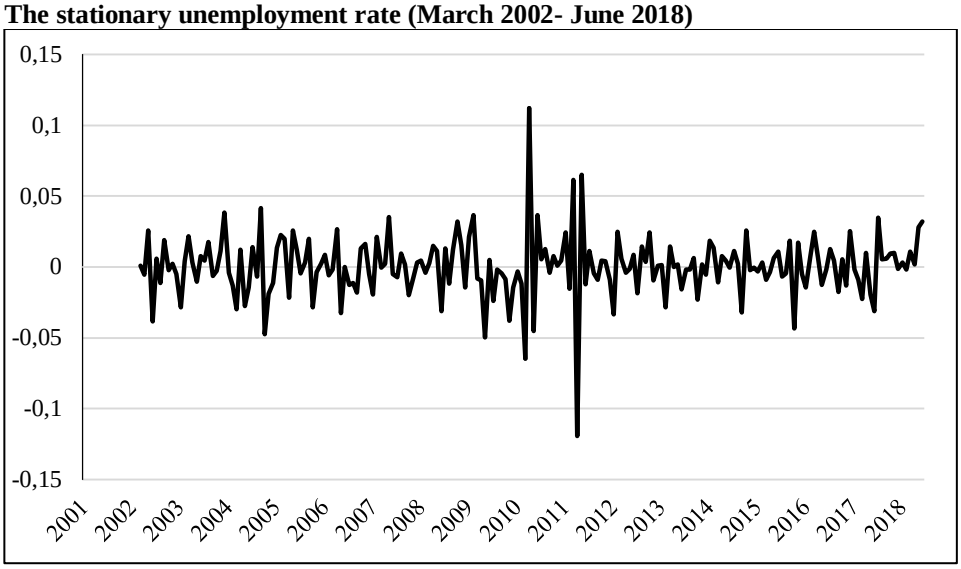
Figure 7.1:
Monthly time series of unemployment rate in Slovakia (January 2001 – June 2018)



Source: Own computations; Central Office of Labour, Social Affairs and Family (2018)

To adjust the series from seasonality, the first order seasonal difference was used together with the second order of nonseasonal difference adjusting the series from a stochastic trend. The new time series depicted in Figure 7.2 is stationary of the form. $z_t = (1-B)^2(1-B^{12})\log(UR_t)$ with the length t = 15, 16, ..., 210 and have been split several times according to Table 7.1.

Figure 7.2:
The stationary unemployment rate (March 2002- June 2018)



Source: Own computations

Model for the series 1

Our analysis will start with the series UR with T = 198 observations splited to the estimation period (in the sample period) with N = 192 observations, from 2001/M01 to 2016/M12 and the validation period with m = 6 observations, from 2017/M01 to 2017/M06, for which the 6- months ex-post forecasts will be computed and their errors evaluated by means of ex-post descriptive measures.

According to the properties of autocorrelation and partial autocorrelation function for variable z_t model SARIMA (0,2,1) (0,1,1)12 was selected, estimated and tested for independence, homoscedasticity and the normality of its residuals.

Model 1

Model 1 was estimated on the sample 2001/M01 – 2016/12, N_1 = 192 observations

$$(1-B)^2(1-B^{12})logUR_t = (1-0.459273B)(1-0.571007B^{12})a_t$$

$$(0.06817) \qquad (0.06136)$$

The parameters are statistically significant at 5% level of significance (standard deviations of coefficients are in parentheses), fulfilling invertibility conditions.

According to the *Box-Pierce test* based on the first 24 autocorrelations, with large statistic Q_{24} = 19.8999 and its P – value = 0.58929, the residuals form a random sequence of numbers. The condition of homoscedasticity for residuals is fulfilled by the F–test at 5% significance level and the normal distribution was confirmed by the Shapiro-Wilk test = 0.976236 with P–value = 0.15727.

Table 7.2:
The mean mesures of residuals, 6-months ex-post forecast errors, 6 months quasi-forecast errors for unemployment rate. Model (1)

Mean statistics model (1)	Estimation period	Validation period	Forecasted period
	2001/M01-2016/M06	2017/M01-2017/M06	2017/M07-2017/M12
	Residuals	6-months ex-post forecast errors	6-months quasi ex-ante forecast errors
RMSE	0.221	0.122	0.299
MAE	0.158	0.120	0.590
MAPE	1.305	1.319	9.650

Source: Own computations

Measures of bias in ME and MPE for both periods were negative: model (1) overestimated actual values and we assume, the same in the future. Comparing the measures in Table 7.2, we assign model (1) as a good model and assume that quasi 6-months ex-ante forecasts for the period 2017/M07 to 2017/M12 will overestimate the actual values.

To detect our premises, we will use series 2001/M01 – 2016/M12, with T_1 = 198 observations to estimate ARIMA(0,2,1)(0,1,1)12 with zero observations for the validation period to compute quasi 6-months ex-ante forecasts for the period 2017/M07 to 2017/M12.

$$(1-B)^2(1-B^{12})logUR_t = (1-0.448272B)(1-0.576157B^{12})a_t$$

$$(0.06745) \qquad (0.05999)$$

The new estimate of model (1) does not change much in all properties compared to the previous model and the quasi ex-ante forecasts from this model are depicted in Table 7.3, together with the actual data concerning the unemployment rate.

Table 7.3:
Actual and forecast quasi 6-months ex-ante values of UR, 2017/M07-2017/12

Period	Actual value UR	Quasi ex-ante forecast UR	Quasi ex- ante error	Percent ex-ante error
2017/M07	6.70	6.54	0.16	2.39
2017/M08	6.54	6.19	0.35	5.35
2017/M09	6.42	5.91	0.51	7.94
2017/M10	6.14	5.49	0.65	10.59
2017/M11	5.95	5.13	0.82	13.78
2017/M12	5.94	4.88	1.06	17.85

Source: Own computations

From Table 7.3, it is evident that the forecasts underestimate actual values. It contrasts with our expectations from a previous estimation of model (1) because MEex-post and MPEex-post are now positive. The errors are increasing almost linearly with increasing horizon. The reason is that the ARIMA model is linear. Other descriptive measures of quasi 6-months ex-ante forecasts are RMSEex-ante = 0.298, MAEex-ante = 0.595 and MAPEex-ante = 9.65%, which were added to Table 7.2 for comparison. We can conclude that RMSEex-ante is 2 times larger, but MAPEex-ante is 7 times larger as in the validation period.

Model for the series 2

Model (2)

Model (2) was estimated on the sample 2001/M1 – 2017/M03, N_2 = 195 observations

$$(1-B)^2(1-B^{12})logUR_t = (1-0.457767B)(1-0.570914B^{12})a_t$$

$$(0.066535) \qquad (0.05993)$$

The parameters are statistically significant at 5% level of significance (standard deviations of coefficients are in parentheses), fulfilling invertibility conditions.

According to the *Box-Pierce test* based on the first 24 autocorrelations, with large statistic Q_{24} = 19.6574 and its P – value = 0.60571, the residuals form a

random sequence of numbers. The condition of homoscedasticity for residuals is fulfilled by the F–test at 5% significance level and the normal distribution was confirmed by the Shapiro-Wilk test = 0.977567 with P–value = 0.20872.

Table 7.4:
The mean mesures of residuals, 6-months ex-post forecast errors, quasi 6-months ex- ante forecasts for unemployment rate, model (2)

Mean statistics model (2)	Estimation period	Validation period	Forecast period
	2001/M01-2017/M03	2017/M04-2017/M09	2017/M10-2018/M03
	Residuals	6 months ex-post forecast errors	6 months quasi ex- ante forecasts
RMSE	0.217	0.151	0.187
MAE	0.155	0.128	0.250
MAPE	1.294	1.855	4.360

Source: Own computations

Comparing the measures in Table 7.4, we can see that MAPE of residuals is smaller than MAPEex-post. We assume that ex-ante forecasts will overestimate actual values because ME and MPE are again negative.

New estimation of the model ARIMA(0,2,1)(0,1,1)12 of the series 2001/M01 – 2017/M09 with $T_2 = 201$ observations (zero observations for validation period) is:

$$(1-B)^2(1-B^{12})logUR_t = (1-0.462289B)(1-0.571179B^{12})a_t$$

$$(0.065359) \qquad (0.060343)$$

From Table 7.5, it is evident that quasi 6-months ex-ante forecasts underestimate the actual values: this is again in contrast with our expectations because MEex-post and MPEex-post were negative, but MEex-ante = 0.25 and MPEex-ante = 4.36% are positive. Again, quasi ex-ante forecast errors are increasing with horizon. Other descriptive measures of quasi ex-ante forecasts are RMSEex-ante = 0.187, MAEex-ante = 0.25 and MAPEex-ante = 4.36%. These values were added to Table 1.4 for comparison with the measures from the validation period.

Table 7.5:
Actual and forecasted quasi ex-ante values of UR, 2017/M10 -2018/M03

Period	Actual value UR	Quazi ex-ante forecast UR	Quazi ex-ante error	Per cent ex- ante error
2017/M10	6.14	6.11	0.03	0.49
2017/M11	5.95	5.85	0.10	1.68
2017/M02	5.94	5.72	0.22	3.70
2018/M01	5.88	5.55	0.33	5.61
2018/M02	5.72	5.31	0.41	7.17
2018/M03	5.55	5.04	0.51	9.19

Source: Own computations

When we compare precision results of model (2) with model (1), which is the same model ARIMA (0,2,1) (0,1,1)12 estimated on the updated series (extended about three new observations), we can conclude that the model is stable with acceptable precision.

Model for the series 3

Model (3)

Model (3) is again model ARIMA(0,2,1)(0,1,1)12, now estimated on the sample 2001/M1 – 2017/M06, $N_3 = 198$ observations

$$(1-B)^2(1-B^{12})\log UR_t = (1-0.448275B)(1-0.576166B^{12})a_t$$
$$(0.06755) \qquad (0.05999)$$

The parameters are statistically significant at 5% level of significance (standard deviations of coefficients are in parentheses), fulfilling invertibility conditions.

According to the *Box-Pierce test* based on the first 24 autocorrelations, with large statistic $Q_{24} = 20.1326$ and its P – value = 0.574745, the residuals form a random sequence of numbers. The condition of homoscedasticity for residuals is fulfilled by the F–test at 5% significance level and the normal distribution was confirmed by the Shapiro-Wilk test = 0.976323 with P–value = 0.15192.

The model was used to compute ex-post forecasts in the validation period with descriptive statistics of residuals together with ex-post forecast errors that are summarised in Table 7.6.

Table 7.6:
The mean measures of residuals, 6-months ex-post forecast errors, quasi 6-months ex- ante forecasts for unemployment rate. Model (3)

Mean statistics model (3)	Estimation period	Validation period	Forecasting period
	2001/M01-2017/M06	2017/M07-2017/M12	2018/M01-2018/M06
	Residuals	6 months ex-post forecast errors	Quasi 6-months ex-ante errors
RMSE	0.216	0.091	0.177
MAE	0.155	0.078	0.178
MAPE	1.307	1.219	3.279
ME	–0.009	0.078	0.178
MPE	–0.059	1.219	3.279

Source: Own computations

From Table 7.6, we can expect that model (3) will underestimate future actual values systematically, because the measures of bias ME and MPE in the validation period have changed to positive.

The new estimation of the model ARIMA(0,2,1)(0,1,1)12 for the series 2001/M01 – 2017/M12 with T_2 = 204 observations (zero observations for the validation period) is

$$(1-B)^2(1-B^{12})\log UR_t = (1-0.457011B)(1-0.573121B^{12})a_t$$
$$(0.06523) \qquad (0.05958)$$

Six months quasi ex-ante forecasts for January 2018 to June 2018 given by the model are depicted in Table 7.7 and their descriptive measures are in Table 7.6.

Table 7.7:
Actual and forecast quasi ex-ante values of UR, 2018/M01 – 2018/M06

Period	Actual value UR	Quasi ex-ante forecast UR	Quasi ex- ante error	Per cent ex-ante error
2018/M01	5.88	5.85	0.03	0.51
2018/M02	5.72	5.69	0.03	0.52
2018/M03	5.55	5.49	0.06	1.08
2018/M04	5.42	5.28	0.14	2.58
2018/M05	5.37	5.08	0.29	5.40
2018/M06	5.43	4.91	0.52	9.58

Source: Own computations

Quasi ex-ante forecasts underestimated actual values with MEex-ante = 0.178 and MAPEex-ante = 3.279. Other measures are RMSEex-post = 0.177 and MAEex-post = 0.178 and are depicted in Table 7.6.

When we compare MAPEex-ante of quasi ex-ante forecasts in all three models, we can say that the chosen model ARIMA(0,2,1)(0,1,1)12 is working quite precisely in spite of the fact that the forecasts are based only on statistical methodology.

7.6 Results of 6-months ex-ante forecast of UR for the next two time series

The last two models will be estimated in the same way as the previous three, because we are still anticipating that they might be quite precise to the end of 2018.

Model for the series 4

Model 4

Model (4) was estimated on the sample 2001/M01 – 2017/M09, $N_3 = 201$ observations

$$(1-B)^2(1-B^{12})\log UR_t = (1-0.46228B)(1-0.57116B^{12})a_t$$
$$(0.06536) \qquad (0.06035)$$

It is evident that the parameters are statistically significant at 5% level of significance (standard deviations of coefficients are in parentheses), fulfilling invertibility conditions.

According to the *Box-Pierce test* based on the first 24 autocorrelations, with large statistic Q_{24} = 20.9172 and its P – value = 0.52586, the residuals form a random sequence of numbers. The residuals are homoscedastic at 5% significance level confirmed by the F-test. Their normal distribution was confirmed by the Shapiro-Wilk test = 0.975736 with P–value = 0.127097.

The mean measures showing how model (4) fits data and creates 6-months ex-post forecasts are depicted in Table 7.8.

Table 7.8:
The mean measures of residuals and 6-months ex-post forecast errors for unemployment rate, model (4)

Mean statistics model (4)	**Estimation period**	**Validation period**
	2001/M01-2017/M09	**2017/M10-2018/M03**
	Residuals	**6 months ex-post forecast errors**
RMSE	0.215	0.045
MAE	0.154	0.038
MAPE	1.312	0.640

Source: Own computations

Because measures of bias ME and MPE for 6-months ex-post forecast errors were positive, we expect that ex-ante forecasts will underestimate actual values.

Six-months ex-ante forecasts for March 2018 to October 2018 were computed by the new estimation of the model (4) on the series with T_4 = 207 and m = 0 observations of the form

$$(1-B)^2(1-B^{12})\log UR_t = (1-0.455758B)(1-0.573581B^{12})a_t$$
$$(0.06455) \qquad (0.05905)$$

These forecasts are depicted in Table 7.9.

Table 7.9:
Actual and forecast ex-ante values of UR, 2018/M04 – 2018/M09

Period	Actual value UR	Ex-ante forecast UR	Quasi ex- ante error	Percent ex-ante error
2018/M04	5.42	5.36	0.06	1.11
2018/M05	5.37	5.18	0.19	3.54
2018/M06	5.43	5.03	0.40	7.37
2018/M07	-	4.93	-	-
2018/M08	-	4.84	-	-
2018/M09	-	4.79	-	-

Source: Own computations

As we can see, the first three months of quasi ex-ante forecasts give quite a large percentage error. Maybe we can conclude that the time for permanently decreasing unemployment rate is in the end.

Finally, in our analysis we will use model ARIMA(0,2,1)(0,1,1)12 for computing the ex- ante forecasts from July 2018 to December 2018, using time series with T_5= 210 observations. The first model (5) was estimated on the sample N_5 = 204 and m = 6 with the following results:

$$(1-B)^2(1-B^{12})\log UR_t = (1-0.456955B)(1-0.572972B^{12})a_t$$
$$(0.065243) \qquad (0.059613)$$

The parameters are statistically significant at 5% level of significance (standard deviations of coefficients are in parentheses), fulfilling invertibility conditions.

According to the *Box-Pierce test*, based on the first 24 autocorrelations, with large statistic Q_{24} = 20.0961 and its P – value = 0.57703, the residuals form a random sequence of numbers. The residuals are homoscedastic at 5% significance level confirmed by the F-test. Their normal distribution was confirmed by the Shapiro-Wilk test = 0.97733 with P–value = 0.184427.

The mean measures showing how the model (5) fits data and creates 6-months ex-post forecasts are depicted in Table 7.10.

Table 7.10:
The mean measures of residuals and 6-months ex-post forecast errors for unemployment rate. Model (5)

Mean statistics model (5)	Estimation period	Validation period
	2001/M01-2017/M12	2018/M01-2018/M06
	Residuals	6 months ex-post forecast errors
RMSE	0.213	0.073
MAE	0.153	0.058
MAPE	1.306	1.069

Source: Own computations

The measures of ex-post forecast errors MEex-post and MPEex-post in the validation period were positive, so we again expect that the 6-months ex-ante forecasts will underestimate an actual value.

The 6-months ex-ante forecasts of the unemployment rate for July 2018 to December 2018, together with their 95% confidence intervals, are depicted in Table 7.11.

Table 7.11:
Forecast ex-ante values of UR, 2018/M06 – 2018/M12 with 95% confidence interval

Period	Ex-ante forecast value UR	Lower 95% Limit UR	Upper 95% Limit UR
2018/M07	5.49	5.30	5.68
2018/M08	5.55	5.20	5.92
2018/M09	5.66	5.12	6.25
2018/M10	5.61	4.90	6.43
2018/M11	5.62	4.70	6.71
2018/M12	5.76	4.61	7.19

Source: Own computations

According to the results in Table 7.11, we would expect slowly increasing values in the unemployment rate in Slovakia, which is not so surprising because winter approaches and the seasonal places might soon be cancelled.

7.7 Conclusion

At the beginning of our analysis, we formulated three aims or three questions to which we would like to find answers by means of our statistical analysis. This was based on the seasonal autoregressive integrated moving average ARIMA(0,2,1)(0,1,1)12 model used for forecasting Slovakia's monthly unemployment rate. This model was estimated several times during the period from December 2016 to January 2018. These repetitions were established on time series always extended about three new observations. Individual estimates of the model showed that it is stable, not only in its parameters but also in its facilities concerning residuals (independence, homoscedasticity and normality), as well. Also the error statistics for both the estimation and validation period were very close, which means that the model is very likely to perform ex-ante forecasts. Hence, the answer to the first question: 'Is the precision of the out-of-sample (ex-post forecast) errors helpful in choosing a good forecasting model?' is positive.

The answer to the second question: 'Is it possible to foresee the mean absolute percentage error of m – period ex-ante forecasts given by the mean absolute percentage error of m – period ex-post forecasts?" is not so clear. For the first model, the MAPE of ex-ante forecast errors was about 7 times larger than the ex-post errors during the validation period, but by using the second and third model, it was better: it was only about 2 times larger.

The answer to the last question: 'Is the selection of the forecasting model by means of analyst better than automatic selection, given by the statistical programme?' is expressly positive. Why? According to my practice, the computer used to offer the model which is statistically good, but with too many parameters and with very biased forecasts.

We are aware of the fact that statistical methods of forecasting cannot represent all other affects that actually influence the unemployment rate, but as we could see, it remains a very useful tool to quickly prepare quite precise forecasts of the unemployment rate.

Box-Jenkins methodology of ARIMA models is one of those methods for computing short-term forecasts of linear stochastic processes. If the horizon of ex-ante forecasts is large, the forecasts are computing on the previous forecasts, together with their errors, so their error is increasing linearly. For this reason, for monthly time series data, we recommend taking the horizon of three months ahead.

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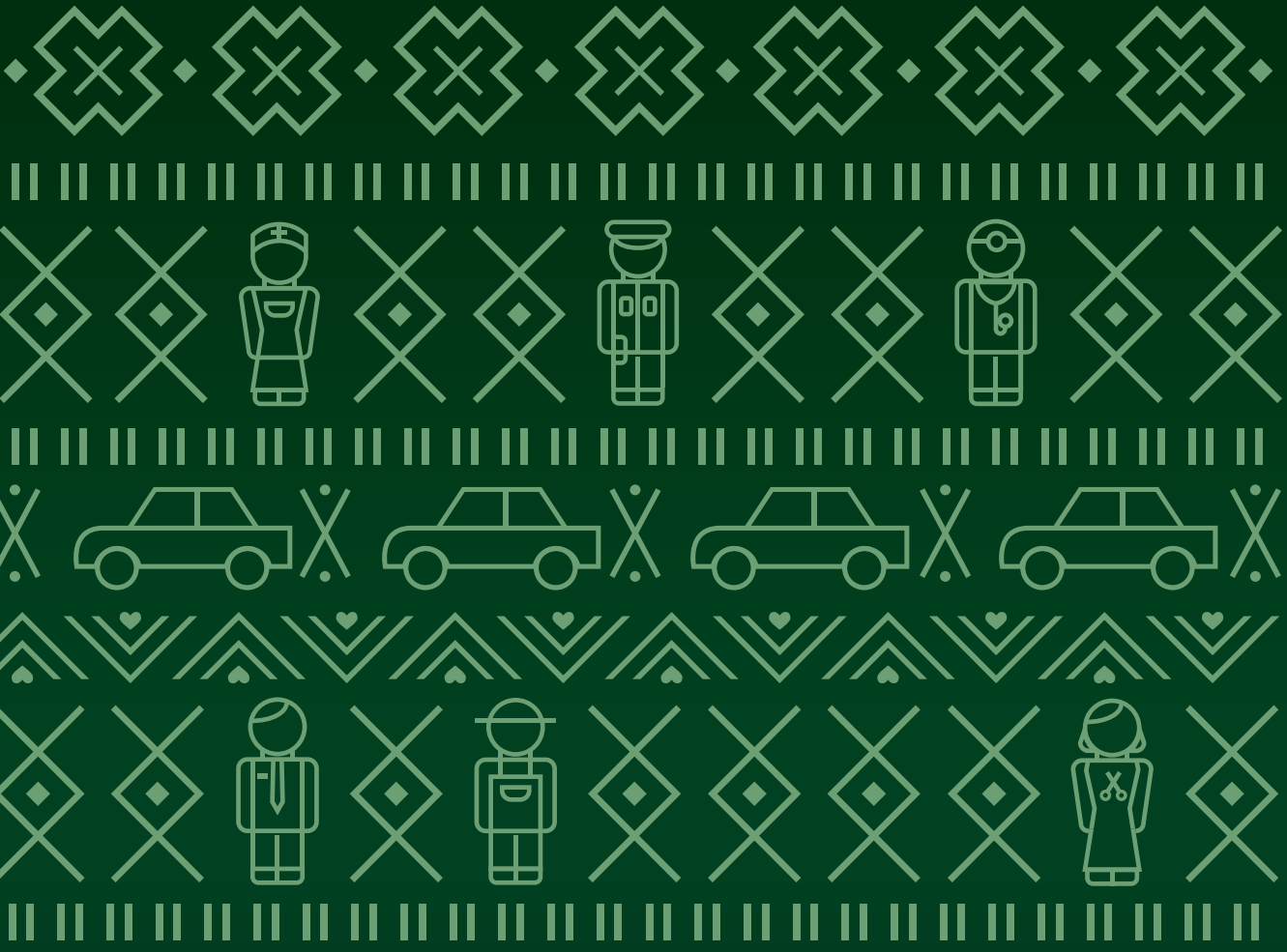

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