# THE IMPACT OF THE ECONOMIC SITUATION OF SMES ON LABOUR MARKETS AND THE FAMILY IN THE V4 COUNTRIES

**Emilie Jašová – Jiří Rotschedl**

**Abstract**

The aim of the paper is to verify and further extend the knowledge on the existence and nature of the impact of the economic situation of enterprises by number of employees on the labour market and family in the V4 countries, the Germany, Austria and Sweden from different perspectives by means of econometric analysis. The empirical results were compared with the findings of international and domestic research and policy documents on the impact of economic indicators of enterprises by number of employees. The analysis first shows the highest prevalence of a statistically significant positive desirable impact of the economic performance for sole traders with a maximum of 9 employees. This was followed by medium-sized enterprises with 50 to 249 employees and, at a distance, large enterprises with 250 or more employees. In small enterprises with 20 to 49 employees, in addition to the prevalence of a positive desirable effect over the undesirable effect, a negative desirable effect of economic indicators on the labour market and the family was also found. For small enterprises with 10 to 19 employees, there is only a positive undesirable effect, and then a negative undesirable effect outweighs the desirable effect.

**Key words:** small and medium-sized enterprises, large enterprises, Capital Markets Union, Descriptive analysis method, SWOT analysis, employment growth rate.

**JEL Code:** E24, E32, E37

## Introduction

The contribution of small and medium-sized enterprises (SMEs) to innovative activities has been the subject of research since the beginning of the 20th century. Among the first to stress the importance of SMEs was Schumpeter (1911). According to him, entrepreneurs create new inventions and try to monetise them on the market. But more recently, Schumpeter (1942) foresaw a decline in the importance of small entrepreneurs in the innovation process as large companies are able to exploit large economies of scale in production, distribution and R&D management.

Small business innovators, in contrast, are responsible for many of the revolutionary innovations of the last two centuries and their innovations have changed the technological paradigm of their time (Baumol, 2004). B. Hall and J. Lerner (2010) argue that SMEs may find it harder to finance innovative activity. The role of SMEs in the innovation process has been strengthened as economic development and technological change have reduced the importance of economies of scale, leading to the removal of structural disadvantages for SMEs (Markatou, 2012).

In recent times, it is often micro firms and SMEs that are the innovation drivers. SEAF (2004) confirms this positive impact on the economy as a whole and on the community. Other research such as the Edinburgh Group (2013) reports little relevance of SMEs in the international sphere. There are also contradictions in economists' and policymakers' views on the role of SMEs in assessing job quality, resilience to cyclical fluctuations, debt, ability to withstand government regulation and other indicators.

The aim of the paper is to use econometric tools to determine the impact of the development of economic indicators of enterprises with different number of employees on the labour market and family.

The following text can be divided into three parts. Part 1 presents an overview of findings from international and domestic research and policy documents on the impact of the economic situation of enterprises with different numbers of employees on the labour market and the family. Part 2 characterizes the data sources and the research method. Section 3 provides empirical testing of the impact of enterprise development on labour market and family indicators, which are disaggregated from different perspectives. The last part presents an overview of the main conclusions from the research of other authors and the conclusions from the analysis carried out in this article.

# 1 Conclusions from domestic and international research and policy documents on the impact of the economic development of enterprises with different numbers of employees on the labour market and the family

## 1.1 Conclusions of domestic and international research

Research in the Czech Republic based on electronic questionnaires confirmed the importance of separate research of enterprises by size, see Slabá (2013). The differentiated sensitivity to the course of the business cycle and thus differentiated ability to recover from the crisis has been confirmed by studies by Frková and Kadeřábková (2015) and Mejstřík (2012).

The Technology Centre of the CAS (2018) assumes that the dynamic component in terms of investment in R&D in the segment of domestic enterprises could consist mainly of SMEs. It is the segment of domestic SMEs that could become one of the stabilizing components of the Czech economy in the future thanks to their own research activities. The development of SMEs can be supported by providing access to specialized consulting services.

In their international research, Datta and Kotikula (2017) examine SMEs in a gendered manner and report that currently, women-owned SMEs are often considered "risky" businesses due to lack of access to collateral and lack of financial literacy.

Dung (2017) also points out the negative effect of the minimum wage on total employment. Increasing the minimum wage will not boost wage compensation of employees in SME firms.

Tambunan (2006) suggests that countries with a higher share of SMEs in their economy tend to have higher economic growth rates, but is not a determinant of this rapid growth. Rocha (2014) analyzes the impact of tax and labor regulations that affect the number of SMEs in each economy. Tax regulation is more likely to be a constraint for smaller enterprises, while labour regulation is expected to become more of a constraint for medium-sized enterprises over time.

OECD (2017) argues that SMEs are more dependent than large companies on their entrepreneurial ecosystem and are more vulnerable to market failures, policy inefficiencies and inconsistencies. The International Finance Corporation (2014) report documents that the World Bank's strategy promotes a women-friendly environment by addressing the financial and non-financial barriers faced by women entrepreneurs globally and nationally.

### 1.2 Conclusions drawn from domestic strategic materials

The European Commission's (2010) initiative "An Industrial Policy for the Globalisation Era" was intended to bring about progress in the business environment, particularly for SMEs as a strong and sustainable industrial base that would be globally competitive. The Digital Agenda for Europe initiative was to create the conditions for fast-growing SMEs to take the lead in emerging markets and to stimulate innovation in ICT in all business sectors. A less resource-intensive Europe must improve the accessibility of the Single Market for SMEs.

According to the Work 4.0 Initiative (National Education Fund o.p.s., 2016), a large number of SMEs ready for technological growth and innovation are awaiting input and direction. The aim of the Knowledge Transfer Partnership Programme is to promote collaboration between SMEs and research organisations. The Gama programme also supports innovation in SMEs, which have the opportunity to receive subsidies to use the results of research already carried out in the laboratories of research organisations.

## 2 Description of the data sources used and methods of analysis

The main explanatory variables in examining the impact of the economic situation in enterprises by number of employees on selected areas of the real economy, its nature and intensity across world economies were time series of economic indicators published by Eurostat (Eurostat, 2019) over the period 2008 to 2016. The data are divided into micro enterprises (0-9 employees), small enterprises (10-19 and 20-49 employees), medium enterprises (50-249 employees) and large enterprises (over 250 employees). The definition of SMEs is derived from the categories used by the Ministry of Industry and Trade (MIT, 2016 and 2017).

In the Mining and Quarrying; Manufacturing; Electricity, Gas, Steam and Air Conditioning Supply; Water Supply, Sewerage, Waste Management and Remediation; and Construction sectors, the following indicators of the economic performance of enterprises are analysed: Production value - mill. EURO; gross operating surplus - million EURO; Wages and Salaries - million EURO; Wage adjusted labour productivity (Apparent labour productivity by average personnel costs) - %; Growth rate of employment - %.

In the sector Wholesale and retail trade, repair of motor vehicles and motorcycles; Transportation and storage; Accommodation and food service activities; Information and communication; Real estate activities; Professional, scientific and technical activities, it was possible to analyse the following indicators from Eurostat data: Value added at factor cost - million EURO; Turnover per person employed - thousand EURO; Apparent labour productivity (Gross value added per person employed) - thousand EURO; Growth rate of employment - %.

Explained or additional explanatory (numerical) variables include the following labour market and family indicators published by Eurostat (Eurostat, 2018b1 ): Monthly minimum wages - % (hereafter minimum wage), which is expressed in purchasing power parity; Tax rate - % (hereafter tax rate); Tax rate on low wage earners: Tax wedge on labour costs - % (hereafter tax burden on low earners); Labour cost index by NACE - % (hereafter labour cost index); Inactive population by sex, age and educational attainment level - % (hereafter inactive population); Long working hours in main job by sex, age, professional status and occupation - % (hereafter working hours); Job tenure by sex, age, professional status and occupation - % (hereinafter job tenure); Young people aged 15-24 neither in employment nor in education and training by sex - % (hereinafter NEET); Active population by sex, age and educational attainment level - % (hereinafter active population); Number of private households by household composition, number of children and age of youngest child - % (hereinafter

[1] The data was downloaded in April 2018.

household composition); Percentage of employed adults working at home by sex, age groups, number of children and age of youngest child - % (hereinafter employed at home); LMP expenditure by type of action - % (hereinafter LMP expenditure); Number of persons by working status within households and household composition - % (hereinafter working at home); and Number of adults by working status within households, number of children and age of youngest child - % (hereinafter working adults).

Indicators of these other explained or explanatory variables were then obtained from Eurostat data: Unemployment rate by occupation was calculated[2] from the indicators Previous occupations of the unemployed, by sex - in 1000 persons and number of Employment by sex, occupation and educational attainment level - in 1000 persons; Unemployment by sex, age and type of employment sought - in 1000 persons and number of Employment by sex, age, occupational status and full-time/part-time - in 1000 persons. In addition, the following labour market indicators have been fully taken over from Eurostat: Unemployment rates by sex, age and NUTS 2 regions - % and Unemployment rates by sex, age and educational attainment level - %. From the calculated and re-calculated unemployment rates, the non-inflation adjusted unemployment rates (NAIRU)[3] by occupation, contract type, regions and by sex, age and educational attainment were calculated using the HP filter[4] . We apply the NAIRU to the analysis as this concept shows the long-term potential of the labour market.

The explained or explanatory variable is also the GPG indicator - Gender pay gap in unadjusted form - % of average gross hourly earnings of men[5] (Eurostat, 2018[6]). This indicator is published from three perspectives. The first perspective is its breakdown by age - Gender pay gap in unadjusted form by age - % (hereafter GPG by age). The second view disaggregates GPG by type of ownership of economic activity - Gender pay gap in unadjusted form by type

[2] The formula has the following format: $u = \frac{U}{E+U}.100.$ The variable *U* represents the unemployment rate in %, *U* represents the number of unemployed persons in the previous job or the number of unemployed persons and *E* represents the number of employed persons.

[3] According to Tobin (1997), the non-accelerating inflation rate of unemployment is the unemployment rate at which the effects of rising inflation from demand-dominated markets offset the effects of falling inflation from supply-dominated markets.

[4] Fabiani and Mestre (2000) base trend and cycle identification on filtering methods such as the Hodrick-Prescott filter. According to the authors, univariate tools are easy to implement.

[5] The indicator measures the difference between average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees. The indicator has been defined as unadjusted, because it gives an overall picture of gender inequalities in terms of pay and measures a concept which is broader than the concept of equal pay for equal work. All employees working in firms with ten or more employees, without restrictions for age and hours worked, are included.

[6] The data was downloaded in March 2018.

of ownership of economic activity % (hereafter GPG by ownership of economic activity). The third area of the GPG view is the type of working arrangements - Gender pay gap in unadjusted form by working time in % (hereafter GPG by working arrangement).

For the poverty indicator, these are the following Eurostat time series (Eurostat, 2019[7]): Inability to face unexpected financial expenses in %; People at risk of poverty or social exclusion by age and sex in %; People at risk of poverty or social exclusion by degree of urbanisation in %; Share of housing costs in disposable household income, by type of household and income group in %; indicator At-risk-of-poverty rate of older people by sex and selected age groups.

The analysis covered the following countries: the Czech Republic), Germany (GE), Hungary (HU), Austria (AU), Poland (PO), Slovakia (SK) and Sweden (SW). The main reason for selecting these countries was to make a comparative analysis of the V4 countries with Austria, which has recently participated in the joint meetings of the group. Germany is the most important trading partner of the V4 groups and Sweden is one of the role models for the V4 countries in the field of social and family policy, for example.

All the time series used were tested with the ADF test (EViews, 2013), which confirmed their stationarity. We use linear regression to assess the intensity and nature of the impact of the economic situation in firms with different numbers of employees on selected labour market and family indicators.

To select the best fitting model to approximate the analyzed data, the adjusted $R^2$ is applied. To test the normality of the residuals, the Jarque Ber test (EViews, 2013) is applied. To test the autocorrelation of the residuals, the Breusch-Godfrey test (EViews, 2013) is applied. To test the heteroskedasticity of the residuals, the Wald test (EViews, 2013) is applied. The Variable Inflation Factor (EViews, 2013) is used in the analysis to measure the carrying capacity of multicollinearity. The failure of the tests of normality of residuals due to fluctuations in the evolution of some segments of the explained variable and the year-to-year changes calculated from them in the case of a large number of observations allows us to assume the validity of the central limit theorem, which states that t tests are asymptotically valid.

The impact of the economic situation of enterprises with different numbers of people on selected labour market and family indicators is examined using the Least Squares Method. The observed value of the regression coefficient then indicates the intensity of the impact of enterprises on the selected indicators and the sign of its nature. The text then refers to a positive

[7] The data was downloaded at the turn of January and February 2019.

impact in the case of a positive sign and a negative impact in the case of a negative sign. In the case that a categorical variable interacted with the enterprise type indicator is not statistically significant in the model, we speak of not demonstrating its influence on the selected labour market and family indicator.

A positive value of the regression coefficient means that the selected labour market and family indicator increases with the improvement of the economic situation of enterprises. A negative value of the regression coefficient means that the selected indicator decreases as enterprises perform better. In our analysis, regression coefficients in the interval from 0.00001 to 0.79 indicate very weak sensitivity of the development of the selected labour and family market indicator to the economic situation of enterprises, in the interval from 0.80 to 1.59 weak sensitivity, in the interval from 1.60 to 2.40 indicate medium sensitivity, in the interval from 2.41 to 3.19 strong sensitivity and in the interval from 3.20 to 3.99 locate very strong sensitivity of the labour and family market indicator to the change in the economic situation of enterprises. Regression coefficient values exceeding 4.00 indicate extremely strong sensitivity.

# 3 Overview of results from empirical testing of the impact of the economic situation of enterprises on the labour market and the family in selected countries

In this section, the econometric method is applied to analyse the nature and intensity of the impact of the economic indicators of enterprises on the labour market and the family from different perspectives and in different degrees of detail of the indicators used. The obtained values of the regression coefficient are divided into three groups. The first group will summarize all proven positive and negative values of regression coefficients with a desirable impact on the development of the labor market and family. The second group will summarize all proven positive and negative values of the regression coefficients with undesirable impact on labor market and family indicators. In the third group, no statistically significant impact of the economic situation of enterprises on the labour market and family was confirmed. The results are presented in the following regression analysis. The enterprise, labour market and family indicators used in all countries are viewed in the structure presented in section 2 of this paper.

## 3.1 The impact of the economic development of micro-enterprises - sole traders on the labour market and the family

In this section, the average values of the regression coefficients are first analysed, which are then augmented with the highest and lowest values of the regression coefficients for the economic indicator, sector and country variables, respectively.

**Tab. 1: Desirable, undesirable and unproven effects of the economic situation of sole traders (0 to 9 employees) on the labour market and the family**

| Dependent variable/ Regression coefficient and Number of statistically unproven effects | Positive regression coefficient | | Number of statistically unproven effects |
|---|---|---|---|
| | Intensity of the beneficial effect | Intensity of the adverse effect | |
| Labour cost index in manufacturing (annual % change) | x | 0,022 | 286 |
| NEET women (%) | x | 0,067 | 274 |
| Number of households of one adult with 2 children under 6 years (% change in %) | x | 1,109 | 248 |
| Percentage of home-employed women with 2 children aged 6-11 years (%) | x | 0,203 | 272 |
| Number of households with 2 children under 6 in which all adults work full time (% change in %) | 0,371 | x | 208 |
| NAIRU of women in full-time employment aged 25-49 (%) | x | 0,002 | 252 |
| NAIRU of women in NUTS 8 (%) | x | 0,016 | 205 |
| GPG in ec. activities in private ownership (%) | x | 0,032 | 265 |
| Share of housing costs in household disposable income (%) | x | 0,214 | 225 |
| Men at risk of poverty or social exclusion aged less than 6 years (%) | x | 0,108 | 248 |
| Single person's inability to cope with unexpected financial costs (%) | x | 0,055 | 209 |

Source: own calculation based on Eurostat data.

A. In general, Table 1 shows a very weak statistically significant positive sensitivity of labour market and family indicators to economic indicators for sole traders with 9 or fewer employees. Specifically, the indicator was the number of households with 2 children under 6 years of age in which all adults work full time, where the number of such households increased by 0.371% when the annual growth in entrepreneurial performance was 1%.

B. In contrast, the highest undesirable impact was found for the indicator number of households of one adult with 2 children under 6 years, which increased by 1.109% ($R^2$ only 0.549), indicating a weak impact when the performance of sole traders increased by 1% year-on-year. The group of results with a positive regression coefficient and very weak sensitivity then includes the indicator of the share of housing costs in household disposable income with a value of +0.214%, the indicator of the percentage of home-employed women with 2 children aged 6-11 with a value of +0.203% and the indicator of men at risk of poverty or social exclusion aged under 6 with a value of +0.108%. Significantly lower undesirable impacts were

mapped on the NEET female indicator (+0.067%), the inability of single persons to face unexpected financial costs (+0.055%), the GPG in activities in private ownership (+0.032%), labour cost index in manufacturing (+0.022% with $R^2$ only 0.507), NAIRU of women in NUTS 8 (+0.016%) and NAIRU of women in full-time employment aged 25-49 (+0.002%).

C. The unproven regression, i.e. statistically insignificant desirable and undesirable impact was found across the monitored economic indicators, especially when mapping the impact on the year-on-year changes in the labour cost index in manufacturing (286 cases), followed by the NEET female indicator (274 cases), the percentage of home-employed women with 2 children aged 6-11 (272 cases), the GPG in econ. activities in private ownership (265 cases), followed by the NAIRU indicator of women in full-time employment aged 25-49 (252 cases), the number of households of one adult with 2 children under the age of 6, or men at risk of poverty or social exclusion under the age of 6 (248 cases), and the share of housing costs in household disposable income (225 cases).

### 3.2 The impact of small business economic development on the labour market and the family

In this section, the average values of the regression coefficients are again analysed first, which are then augmented with the highest and lowest values of the regression coefficients for the economic indicator, sector and country variables, respectively.

**Tab. 2a: The desirable, undesirable and unproven impact of the economic situation of small enterprises (10 to 19 employees) on the labour market and the family**

| Dependent variable/ Regression coefficient and Number of statistically unproven effects | Positive regression coefficient | | Negative regression coefficient | | Number of statistically unproven effects |
|---|---|---|---|---|---|
| | Intensity of the beneficial effect | Intensity of the adverse effect | Intensity of the beneficial effect | Intensity of the adverse effect | |
| Tax rate for one person with two children (%) | x | 0,637 | x | x | 27 |
| Inactive women aged 25-49 with upper secondary education (% change in %) | x | x | -0,099 | x | 134 |
| NEET women (%) | x | 0,147 | x | x | 138 |
| Number of households of one adult with 2 children under 6 years (% change in %) | x | 3,094 | x | x | 71 |
| Percentage of home-employed women with 2 children aged 6-11 years (%) | x | 0,526 | x | x | 166 |
| Number of households with 2 children under 6 in which all adults work full time (% change in %) | x | x | x | -0,199 | 97 |
| NAIRU of women in basic occupations (%) | x | x | -0,032 | x | 80 |
| NAIRU of women in full-time employment aged 25-49 (%) | x | 0,012 | x | x | 197 |
| NAIRU of women in NUTS 8 (%) | x | 0,038 | x | x | 142 |
| GPG in ec. activities in private ownership (%) | x | x | -0,041 | x | 228 |
| GPG in part-time employment (%) | x | 0,053 | x | x | 78 |
| Share of housing costs in household disposable income (%) | x | 0,56 | x | x | 167 |
| People at risk of poverty or social exclusion in urban areas (%) | x | 0,274 | x | x | 209 |
| Single person's inability to cope with unexpected financial costs (%) | x | x | -0,578 | x | 37 |

Source: own calculation based on Eurostat data.

A. Table 2a shows only a very weak statistically significant negative sensitivity of labour market and family indicators to the evolution of economic indicators for enterprises with a maximum of 19 employees. The year-on-year increase in the performance of these small enterprises had a desirable effect, causing the indicator of the inability of a single person to face unexpected financial costs to fall by 0.578%), inactive women aged 25 to 49 with more than a high school education to fall by 0.099%, GPG in ec. activities in private ownership by 0.041% and NAIRU of women in basic occupation by 0.032%.

B. In contrast, the highest undesirable positive impact was found for the indicator number of households of one adult with 2 children under 6, which increased by 3.094% when the performance of these small enterprises increased by 1% year-on-year, signalling strong sensitivity ($R^2$ only 0.550). The group of results with a positive regression coefficient also includes the indicator tax rate of one person with two children +0.637%, the indicator housing costs as a share of household disposable income +0.560%, and the percentage of home-employed women with 2 children aged 6-11 years +0.526%. Significantly lower undesirable impacts were mapped on the indicators people at risk of poverty or social exclusion in urban

areas (+0.274%), NEET women (+0.147%), GPG in part-time employment (+0.053%), NAIRU of women in NUTS 8 (+0.038) and NAIRU of women in full-time employment aged 25-49 (+0.012%). The year-on-year increase in the performance of these small businesses also had an undesirable effect, causing the indicator for the number of households with 2 children under 6 years of age in which all adults work full-time to fall by 0.199%.

C. The unproven regression was found across the monitored economic indicators, particularly when mapping the impact on year-on-year changes in the GPG in ec. activities in private ownership (228 cases), followed by the indicator people at risk of poverty or social exclusion in urban areas (209 cases), the NAIRU of women in full-time employment aged 25 to 49 (197 cases), and the share of housing costs in household disposable income (167 cases), the percentage of women employed at home with 2 children aged 6-11 (166 cases) and, with a lag, the NAIRU of women in NUTS 8 (142 cases), NEET women (138 cases) and inactive women aged 25-49 with more than secondary education (134 cases).

**Tab. 2b: Desirable, undesirable and unproven effects of the economic situation of small enterprises (20 to 49 employees) on the labour market and the family**

| Dependent variable/ Regression coefficient and Number of statistically unproven effects | Positive regression coefficient | | Negative regression coefficient | | Number of statistically unproven effects |
|---|---|---|---|---|---|
| | Intensity of the beneficial effect | Intensity of the adverse effect | Intensity of the beneficial effect | Intensity of the adverse effect | |
| Tax rate for one person with two children (%) | x | 0,062 | x | x | 147 |
| Length of working time of female managers (%) | 0,257 | x | x | x | 182 |
| Duration of work of female technicians up to one year (%) | x | 0,06 | x | x | 217 |
| NEET women (%) | x | 0,01 | x | x | 275 |
| Number of households of one adult with 2 children under 6 years (% change in %) | x | 0,194 | x | x | 267 |
| Percentage of home-employed women with 2 children aged 6-11 years (%) | x | 0,008 | x | x | 213 |
| LMP expenditure to service providers (%) | 0,001 | x | x | x | 168 |
| NAIRU of women in basic occupations (%) | x | 0,047 | x | x | 260 |
| NAIRU of women in full-time employment aged 25-49 (%) | x | 0,011 | x | x | 228 |
| NAIRU of women in NUTS 8 (%) | x | 0,002 | x | x | 238 |
| NAIRU of women with more than secondary education aged 50-54 (%) | x | 0,008 | x | x | 269 |
| GPG in ec. activities in private ownership (%) | x | 0,149 | x | x | 254 |
| GPG in part-time employment (%) | x | x | -0,017 | x | 146 |
| Share of housing costs in household disposable income (%) | x | 0,015 | x | x | 132 |
| People at risk of poverty or social exclusion in urban areas (%) | x | 0,003 | x | x | 229 |
| Single person's inability to cope with unexpected financial costs (%) | x | 0,523 | x | x | 192 |

Source: own calculation based on Eurostat data.

A. Table 2b shows a generally very weak statistically significant positive and negative sensitivity of the labour market and family indicators to the evolution of economic indicators for firms with a maximum of 49 employees. In the case of the positive regression coefficient, the indicators are working hours of female managers and LMP expenditures on service providers, where, with a 1% year-on-year increase in the performance of these businesses, working hours increased by 0.257% and expenditures on services increased by 0.001%. The year-on-year increase in the performance of these small businesses also had a desirable effect, causing the GPG in part-time employment to fall by 0.017%.

B. On the other hand, the highest undesirable positive impact was mapped for the indicator of the inability of single persons to face unexpected financial costs, which increased by 0.523% with a 1% year-on-year increase in the performance of these small enterprises. The group of results with a positive regression coefficient also includes the indicator of the number of households of one adult with 2 children under 6 years +0.194% with $R^2$ of 0.516 and the indicator of GPG in ec. activities in private ownership +0.149%. Significantly lower undesirable impact has been mapped on the indicator tax rate of one person with two children +0.062%, duration of work of female technician under one year +0.060%, NAIRU of women in basic occupation +0.047%, share of housing costs in household disposable income +0.015%, NAIRU of women in full-time employment aged 25-49 +0.011%, NEET women +0.010%, percentage of home-employed women with 2 children aged 6-11 years, respectively. NAIRU of women with higher than secondary education aged 50-54 +0.008%, people at risk of poverty or social exclusion in urban areas +0.003% and NAIRU of women in NUTS 8 +0.002%.

C. The statistically insignificant desirable and undesirable impact was mainly located across the economic indicators under study when assessing the impact on the year-on-year changes in the NEET female indicator (275 cases), followed by the NAIRU of women with more than secondary education aged 50-54 (269 cases), the number of households of one adult with two children under 6 (267 cases), the NAIRU of women in elementary occupations (260 cases), the GPG in ec. activities in private ownership (254 cases) and, with a lag, the NAIRU of women in NUTS 8 (238 cases), people at risk of poverty or social exclusion in urban areas (229 cases) and the NAIRU of women in full-time employment aged 25 to 49 (228 cases).

### 3.3 The impact of the economic development of medium-sized enterprises on the labour market and the family

In this section, the average values of the regression coefficients are first considered, which are then supplemented by the highest and lowest values of the regression coefficients for the economic indicator, sector and country variables, respectively.

**Tab. 3: Desirable, undesirable and unproven impact of the economic situation of medium-sized enterprises (50-249 employees) on the labour market and the family**

| Dependent variable/ Regression coefficient and Number of statistically unproven effects | Positive regression coefficient | | Negative regression coefficient | | Number of statistically unproven effects |
|---|---|---|---|---|---|
| | Intensity of the beneficial effect | Intensity of the adverse effect | Intensity of the beneficial effect | Intensity of the adverse effect | |
| Tax rate for one person with two children (%) | x | 0,043 | x | x | 160 |
| Labour cost index in manufacturing (annual % change) | x | 0,027 | x | x | 280 |
| Inactive women aged 25-49 with upper secondary education (% change in %) | x | 0,053 | x | x | 264 |
| Length of working time of female managers (%) | 0,02 | x | x | x | 196 |
| Duration of work of female technicians up to one year (%) | x | 0,013 | x | x | 288 |
| NEET women (%) | x | 0,064 | x | x | 259 |
| Number of households with 2 children under 6 in which all adults work full time (% change in %) | 0,466 | x | x | x | 285 |
| NAIRU of women in basic occupations (%) | x | 0,005 | x | x | 179 |
| NAIRU of women in NUTS 8 (%) | x | 0,018 | x | x | 200 |
| NAIRU of women with upper secondary education aged 50-54 (%) | x | 0,042 | x | x | 214 |
| GPG in ec. activities in private ownership (%) | x | 0,087 | x | x | 262 |
| GPG in part-time employment (%) | x | 0,087 | x | x | 115 |
| Share of housing costs in household disposable income (%) | x | 0,28 | x | x | 257 |
| Single person's inability to cope with unexpected financial costs (%) | x | 0,073 | x | x | 237 |
| Risk of poverty for men aged 65 and under (%) | x | 0,068 | x | x | 281 |

Source: own calculation based on Eurostat data.

A. Table 3 shows a very weak statistically significant positive sensitivity of labour market and family indicators to the evolution of economic indicators for firms with a maximum of 249 employees. In terms of the positive regression coefficient, the indicators are the number of households with 2 children under 6 in which all adults work full time and the length of working hours of female managers, where the number of these families increased by 0.466%

and the length of working hours increased by 0.020% when the performance of these businesses increased by 1% year-on-year.

B. In contrast, the highest undesirable positive impact was assessed for the indicator of the share of housing costs in household disposable income, which increased by 0.280% with a 1% year-on-year increase in the performance of these medium-sized enterprises. The group of results with a positive value of the regression coefficient also includes the indicator GPG in ec. GPG in privately owned activities or GPG in part-time employment +0.087%, the indicator of the inability of a single person to face unexpected financial costs +0.073%, the poverty risk rate for men aged under 65 +0.068% and NEET women +0.064%. Significantly lower undesirable impact was mapped on the indicator of inactive women aged 25 to 49 with higher than secondary education +0.053%, tax rate of a single person with two children +0.043%, NAIRU of women with higher secondary education aged 50 to 54 +0,042%, the labour cost index in manufacturing +0.027% with $R^2$ of 0.580, the NAIRU of women in NUTS 8 +0.018%, the duration of work of a female technician under one year +0.013% and the NAIRU of women in elementary occupations +0.005%.

C. The unproven regression was confirmed across the observed economic indicators, especially when examining the impact on year-on-year changes in the indicator of the duration of work of female technicians under one year (288 cases), followed by the indicator of the number of households with 2 children under 6 years, in which all adults work full time (285 cases), the poverty risk rate for men under 65 (281 cases), the labour cost index in manufacturing (280 cases), inactive women aged 25 to 49 with more than secondary education (264 cases), GPG in ec. activities in private ownership (262 cases), NEET women (259 cases), the share of housing costs in household disposable income (257 cases) and, with a lag, the indicator of the inability of single persons to face unexpected financial costs (237 cases), the NAIRU of women aged 50 to 54 with upper secondary education (214 cases) and the NAIRU of women in NUTS 8 (200 cases).

### 3.4 The impact of the economic development of large enterprises on the labour market and the family

This section also starts with an analysis of the average values of the regression coefficients, which is then illustrated by the highest and lowest values of the regression coefficients for the economic indicator, sector and country variables, respectively.

**Tab. 4: Desirable, undesirable and unproven impact of the economic situation of large enterprises (250+ employees) on the labour market and the family**

| Dependent variable/ Regression coefficient and Number of statistically unproven effects | Positive regression coefficient | | Negative regression coefficient | | Number of statistically unproven effects |
|---|---|---|---|---|---|
| | Intensity of the beneficial effect | Intensity of the adverse effect | Intensity of the beneficial effect | Intensity of the adverse effect | |
| Tax rate for one person with two children (%) | x | 0,022 | x | x | 152 |
| Inactive women aged 25-49 with upper secondary education (% change in %) | x | 0,025 | x | x | 220 |
| Duration of work of female technicians up to one year (%) | x | 0,008 | x | x | 256 |
| NEET women (%) | x | 0,073 | x | x | 221 |
| Number of households of one adult with 2 children under 6 years (% change in %) | x | 0,218 | x | x | 274 |
| LMP expenditure to service providers (%) | 0,001 | x | x | x | 181 |
| All adults living in work with children do not work (% change in %) | x | 0,044 | x | x | 139 |
| Number of households with 2 children under 6 in which all adults work full time (% change in %) | 0,574 | x | x | x | 160 |
| NAIRU of women in basic occupations (%) | x | 0,008 | x | x | 178 |
| NAIRU of women in NUTS 8 (%) | x | 0,001 | x | x | 223 |
| GPG wholesale (%) | x | 0,204 | x | x | 266 |
| GPG in ec. activities in private ownership (%) | x | 0,14 | x | x | 205 |
| Share of housing costs in household disposable income (%) | x | 0,274 | x | x | 273 |
| Men at risk of poverty or social exclusion aged less than 6 years (%) | x | 0,324 | x | x | 183 |
| People at risk of poverty or social exclusion in urban areas (%) | x | 0,016 | x | x | 167 |
| Single person's inability to cope with unexpected financial costs (%) | x | 0,347 | x | x | 273 |
| Risk of poverty for men aged 65 and under (%) | x | 0,071 | x | x | 272 |

Source: own calculation based on Eurostat data.

A. Table 4 confirms the generally very weak statistically significant positive sensitivity of labour market and family indicators to the evolution of economic indicators for firms with 250 or more employees. Related to the positive regression coefficients are the indicators number of households with 2 children under 6 in which all adults work full time and LMP expenditures to service providers, where, with a 1% year-on-year increase in the performance of these large firms, the number of these families increased by 0.574% and LMP expenditures increased by 0.0009%.

B. In contrast, the highest undesirable positive impact was mapped for the indicators of the inability of single persons to face unexpected financial costs and men at risk of poverty or

social exclusion aged under 6, which increased by 0.347% and 0.324%, respectively, for a 1% year-on-year increase in the performance of these large firms. The group of outcomes with a positive regression coefficient value also includes the indicator housing costs as a share of household disposable income +0.274%, the number of households of one adult with 2 children under 6 years +0.218% with $R^2$ of 0.571 and GPG in wholesale trade +0.204%. A significantly lower undesirable impact was mapped on the indicator GPG in ec. activities in private ownership +0.140%, NEET women +0.073%, poverty risk rate for men aged under 65 +0.071%, all adults living in a couple with children not working +0.044%, inactive women aged 25-49 with more than secondary education +0,025%, tax rate for one person with two children +0.022%, people at risk of poverty or social exclusion in urban areas +0.016%, duration of work of a female technician up to one year, respectively. NAIRU of women in basic occupations +0.008% and NAIRU of women in NUTS 8 +0.001%.

C. Statistically insignificant desirable and undesirable effects were confirmed across the monitored economic indicators, especially when considering the impact on year-on-year changes in the indicators number of households of one adult with two children under 6 years of age (274 cases), share of housing costs in household disposable income, respectively. The inability of single persons to face unexpected financial costs (273 cases) and the poverty risk rate for men aged under 65 (272 cases), followed by the indicator GPG in wholesale trade (266 cases), duration of work of female technicians under one year (256 cases), NAIRU of women in NUTS 8 (223 cases), NEET of women (221 cases), Inactive women aged 25 to 49 with more than secondary education (220 cases), GPG in ec. activities in private ownership (205 cases) and, with a distance, the indicator men at risk of poverty or social exclusion aged less than 6 years (183 cases), LMP expenditure to service providers (181 cases) and NAIRU of women in basic occupation (178 cases).

## Conclusions from the analysis

In the present paper, we sought to demonstrate the impact of the economic situation of firms with different numbers of employees on the labour market and the family using regression analysis. The appropriateness of applying the analysis of the nature/intensity of the relationship and suggesting a causal relationship to an extended set of labour market and family indicators confirmed some new implications.

**The main results from the analysis of average values for individual enterprises with different numbers of employees include:**

**Tab. 5: The average desirable, undesirable and statistically unproven impact of the economic development of enterprises with different numbers of employees on the labour market and the family**

| Explanatory variable/ Regression coefficient and Number of statistically unproven effects | Positive regression coefficient | | Negative regression coefficient | | Number of statistically unproven effects |
|---|---|---|---|---|---|
| | Intensity of the beneficial effect | Intensity of the adverse effect | Intensity of the beneficial effect | Intensity of the adverse effect | |
| **Micro-enterprises - sole traders (0 to 9 employees)** | | | | | |
| Average/ Total number | 0,371 | 0,183 | x | x | 2692 |
| **Small enterprises (10 to 19 employees)** | | | | | |
| Average/ Total number | x | 0,593 | -0,188 | -0,199 | 1771 |
| **Small enterprises (20 to 49 employees)** | | | | | |
| Average/ Total number | 0,129 | 0,084 | -0,017 | x | 3417 |
| **Medium-sized enterprises (50-249 employees)** | | | | | |
| Average/ Total number | 0,243 | 0,066 | x | x | 3477 |
| **SMEs (0 to 249 employees)** | | | | | |
| Average/ Total number | 0,223 | 0,203 | -0,153 | -0,199 | 11357 |
| **Large enterprises (over 250 employees)** | | | | | |
| Average/ Total number | 0,288 | 0,118 | x | x | 3643 |

Source: own calculation based on Eurostat data.

Table 5 first shows the highest prevalence of a statistically significant positive desirable impact of the development of economic results for sole traders with 9 or fewer employees (0.371 vs. 0.183). This was followed by medium-sized enterprises with between 50 and 249 employees (0.243 vs. 0.066), followed by large enterprises with 250 or more employees (0.288 vs. 0.118). In small enterprises with between 20 and 49 employees, in addition to the prevalence of a positive desirable effect over an undesirable effect (0.129 vs. 0.084), a negative desirable effect of the development of economic indicators on the labour market and the family (-0.017) was also found. For small enterprises with between 10 and 19 employees, only a positive undesirable effect (0.593) is found at first, and the negative undesirable effect also outweighs the desirable effect (-0.199 and -0.188, respectively). The SMEs in total then had a predominantly positive effect in the case of a desirable relationship (0.223 vs. 0.203), while in the case of a negative relationship, the undesirable effect was predominant (-0.199, vs. -0.153). The overall conclusion of the analysis conducted is in line with the first statement of M. Slaba (2013), which proves the appropriateness of conducting a separate analysis of large enterprises and separately micro, small and medium-sized enterprises.

**Tab. 6: Number of desirable, undesirable and statistically unproven effects of the economic development of enterprises with different numbers of employees on the labour market and the family**

| Explanatory variable/ Number of favourable, unfavourable and statistically unproven effects | Positive regression coefficient | | Negative regression coefficient | | Number of statistically unproven effects |
|---|---|---|---|---|---|
| | Intensity of the beneficial effect | Intensity of the adverse effect | Intensity of the beneficial effect | Intensity of the adverse effect | |
| **Micro-enterprises - sole traders (0 to 9 employees)** | | | | | |
| Total number of | 1 | 10 | x | x | 2692 |
| **Small enterprises (10 to 19 employees)** | | | | | |
| Total number of | x | 9 | 4 | 1 | 1771 |
| **Small enterprises (20 to 49 employees)** | | | | | |
| Total number of | 2 | 13 | 1 | x | 3417 |
| **Medium-sized enterprises (50-249 employees)** | | | | | |
| Total number of | 2 | 13 | x | x | 3477 |
| **SMEs (0 to 249 employees)** | | | | | |
| Total number of | 5 | 45 | 5 | 1 | 11357 |
| **Large enterprises (over 250 employees)** | | | | | |
| Total number of | 2 | 15 | x | x | 3643 |

Source: own calculation based on Eurostat data.

According to Table 6, the greatest prevalence of the number of statistically significant positive undesirable impacts on economic performance over the number of desirable ones was found for large enterprises with more than 250 employees (15 vs. 2). The same was true for medium-sized enterprises with between 50 and 249 employees (13 vs. 2). This also includes small enterprises with between 20 and 49 employees, where, however, in addition to the previously mentioned excess of cases of positive undesirable impact over desirable impact (13 vs. 2), one case of statistically significant negative desirable impact was also mapped. In the case of sole traders with up to 9 employees, the excess of positive undesirable over desirable impact was only 9 (10 vs. 1). For small businesses with between 10 and 19 employees, 9 cases of positive undesirable impact were found, together with an excess of the number of cases of negative regression coefficient with desirable impact over undesirable impact (4 vs. 1). SMEs with up to 249 employees in total then showed both a significantly higher number of cases with a positive undesirable effect than with a desirable one (45 vs. 5), but also an excess of the number of cases with a negative desirable effect over an undesirable one (5 vs. 1). The summary conclusion of the analysis thus contradicts, for example, the second claim of M. Slaba (2013), according to which no statistically significant difference was found between micro, small and medium-sized enterprises.

## Literature used

BAUMOL, W. J. 2004. "Entrepreneurial enterprises, large established firms and other components of the free-market growth machine," Small Business Economics, 23, pp. 9-21, DOI: 10.1023/B:SBEJ.0000026057.47641.a6.

DATTA, N.; KOTIKULA, A. 2017. Fostering Quality of Employment for Women. JOBS WORKING PAPER Issue No. 1. World Bank's Jobs. Pp. 5-38.

DUNG, P. K. 2017. The effects of minimum wage hikes on employment and wages in Viet Nam's micro, small, and medium enterprises. WIDER Working Paper 2017/95. The United Nations University World Institute for Development Economics Research. ISSN 1798-7237 ISBN 978-92-9256-319-6. Pp. 1-12.

EUROPEAN COMMISSION. 2010. EUROPE 2020 A strategy for smart, sustainable and inclusive growth. Brussels, 3.3.2010, COM(2010) 2020 final. COM(2010) 2020 final. Pages 2-34. https://koopolis.cz/sekce/legislativa-a-strategie/254-strategie-evropa-2020-strategie-pro-inteligentni-a-udrzitelny-rust-podporujici-zacleneni

Eurostat. accessed July 2019. https://ec.europa.eu/eurostat/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_nPqeVbPXRmWQ&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_pos=1&p_p_col_count=2

EViews. 2013. EViews Version 7 Help Topics

FABIANI, S.; MESTRE, R. 2000. Alternative measures of the NAIRU in the euro area: estimates and assessment. ECB WP.

FRKOVÁ, J.; KADEŘÁBKOVÁ, B. 2015. SME Life Cycle Model under Globalization. The 9th International Days of Statistics and Economics, Prague, September 10-12, 2015. pp. 435-446.

HALL, B., LERNER, J. 2010. "The financing of R&D and innovation." In Handbook of the Economics of Innovation, Vol. 1, pp. 609-639. North-Holland. DOI: 10.1016/S0169-7218(10)01014-2.

INTERNATIONAL FINANCE CORPORATION. 2014. Women-Owned SMEs: A Business Opportunity for Financial Institutions, A Market and Credit Gap Assessment over IFCś Portfolio Gender Baseline. International Finance Corporation, World Bank Group. Pp. 5-39.

MARKATOU, M. 2012. "The Role and the Importance of the Greek SMEs in the Production of Innovation," Journal of Innovation and Business Best Practices, 2012: 1, DOI: 10.5171/2012.268692.

MEJSTŘÍK, M. 2012. The real impact of the economic crisis on the results of business activity. Svaz průmyslu a obchodu, EEIP, a.s., Analysis prepared within the project "Sustainability of social dialogue in the Czech Republic - development of the quality of services of employers' representatives", reg. no. CZ.1.04/1.1.01/02.00012.

MIT. 2017. Report on the development of small and medium-sized enterprises and their support in 2016. SME Support Department.

MIT. 2016. Report on the development of small and medium-sized enterprises and their support in 2016. SME Support Department.

MoLSA. 2013a. Employment Policy Strategy to 2020. MOLSA. Prague April 2013. Page 2-50. https://www.databaze-strategie.cz/cz/mpsv/strategie/strategie-politiky-zamestnanosti-do-roku-2020

MoLSA. 2013b. Employment Policy Concept 2013 - 2020. Prague, March 2013. p. 22. https://www.esfcr.cz/file/8987/

NATIONAL EDUCATION FUND, o.p.s. 2016. Labour Initiative 4.0, Study. Ministry of Labour and Social Affairs. http://portal.mpsv.cz/sz/politikazamest/prace_4_0. Pages 3-78.

OECD. 2016. OECD Economic Surveys - Czech Republic. Committee on Economic

ROCHA, E.A.G. 2014 The Impact of Business Environment on Small and Medium Enterprise Sector's Size and Employment: A Cross Country Comparison. Kobe University, 2-1 Rokkodai-cho, Nada-ku, Kobe 657-8501, Japan. Str. 2-36. https://www.semanticscholar.org/paper/The-Impact-of-Business-Environment-on-Small-and-%E2%80%99-s-Rocha/91bd896423d8ee07cd7c9783ce8f0d1287a7695d

SCHUMPETER, J. A. 1942. "Capitalism, socialism and democracy," 2nd ed. New York, New York: Harper and Brothers.

SCHUMPETER, J. A. 1911. "The theory of economic development," Harvard Economic Studies. Vol. XLVI.

WEAK, M. 2013. Analysis of key stakeholder groups of commercial entities in the Czech Republic. Littera Scripta. 2013, 6(2), ISSN 1805-9112. Pp. 114-123.

TAUMBUNAN, T. 2006. Micro, Small and Medium Enterprises and Economic Growth. Working Paper Series No. 14. CENTER FOR INDUSTRY AND SME STUDIES FACULTY OF ECONOMICS, UNIVERSITY OF TRISAKTI. Pp. 2-23.

TECHNOLOGY CENTRE OF THE CAS. 2018. Potential growth of private investment in research, development and innovation affecting the structure of the economy, employment and public budgets, Brief summary of the report. Pages 3-14.

TOBIN, J. 1997. Supply Constraints on Employment and Output: NAIRU versus Natural Rate. Cowles Foundation Paper 1150. Yale University, New Haven.

## Contact

Ing. Emilie Jasova, Ph.D.

University of Economics and Administration

Estonská 500, 101 00 Prague 10, Czech Republic

entropa@seznam.cz

Ing. Bc. Jiri Rotschedl, Ph.D.

Prague University of Economics and Business

W. Churchilla Sq. 4, Prague 3, 130 67, Czech Republic

jiri@rotschedl.com