A role of minimum wage

In the 4th industrial revolution

Increasing a level of minimum wage as a tool in a fight against employment polarization, precarious work and increasing poverty

Prague
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Introduction

The minimum wage institute is used by a majority of developer countries to equalize price conditions on labour market. Minimum wage has become a tool in the fight against polarization of workforce and it strives to limit working poverty, that is poverty of people who fulfill a description of poverty or material deprivation, although they participate on labour market. However, minimum wage can influence only a position of those who are active on labour market (that means they are employed). Therefore, in the past years, the role of traditional institutes of labour market including minimum wage, which has been changing in connection with digitalization and automatization, has been a topic of discussions for several decades.

In connection with digitalization and automatization, there have been gradual changes in the structure of workforce as well as changes in the requirements imposed on workforce. Workers – if they want to remain on labour market – will have to spend more time on education and improving their qualifications. At the same time, they will have to cope with more frequent changes of their position across different sectors. This is going to be a challenge especially for older employees who work on the same position all their career and use the advantages of definitness in state sphere and/or its alternations in private sphere.

However, the fourth industrial revolution does not bring only changes in a content of work, but it also allows to take work using a brand new approach. There are new forms of employment, which cannot be included into national legislations due to their fast arrival. The advantages and disadvantages of new forms of work are moreless subjective and a crossing bridge among them is quite fragile. But in general, new forms of work bring a risk of precarisation of work. In this respect, precariousness of work lies in the insecurity of work and in hard to enforce rights, which traditional employees have e.g. the social system entitlements (Lewchuk and col., 2008, Lewchuk, 2017).

Drowing level of digitalization and automatization will be reflected also in the changes in the area of remuneration. Possible decreased wages are often discussed, nevertheless, foreign research indicates that there is a two-way relationship between the level of remuneration and level of automatization. Minimum wage therefore plays its role in this area, too – growing minimum wage influences a level of personal costs and for specific companies, investments into technology will become economically more profitable compared to how it was years ago. On the other hand, however, growing requirements for qualification of workers due to greater automatization are reflected in a growing level of remuneration. The problematics of a relationship of remuneration level and modernization of production should be assessed as a complex, as polarization in respect of workforce structure is closely connected with the growing differences in a level of their remuneration (Kalleberg, 2011).
It is clear from the above that the fourth industrial revolution may bring many positive changes to labour market, which can also have some negative impacts like polarization of workforce, precarization of work or poverty. A traditional tool used in a fight against these negative aspects of labour market is je minimum wage. The aim of the study will therefore be to evaluate the possibilities of the minimum wage institute even in the time of increasing digitalization and automatization.

The structure of the study is the following. The first part will summarize a development of minimum wage in historical context, while an emphasis will be put on an international comparison, too. The second part will be aimed at identification of workers for whom low remuneration for work is characteristic. The third part will then discuss a role of minimum wage when trying to eliminate poverty in society. Part four will deal with precarious work and its most frequent forms in the Czech Republic. Part five will summarize the results of international research concerning the impacts of ongoing digitalization and modernization of production, and based on that, a role of minimum wage in highly automatized economy will be discussed. Last part will deal with the problematics of universal basic income, which becomes a phenomenon in the past decades across developed as well as less developed countries, and offers possible solutions for people who will become unemployed or unemployable due to the fourth industrial revolution. At the end, the results of the study are going to be described.
1 Minimum wage in historical context

Minimum wage can fulfill its functions only if its amount is set up on optimum level, and at the same time, it develops in a steady and predictable manner in a long-term horizon. Setting the optimum level of minimum wage is, however, not an easy job, as it is not possible to achieve an absolute balance of both basic functions of minimum wage from a viewpoint of employees as well as employers. Through its socially-protective function, minimum wage should provide employees adequate level of income not to fall under a socially acceptable borderline. Thanks to its economic-criterial function, people should be motivated to work and not to only receive social benefits. On the side of employers, minimum wage should eliminate underbidding by cheap workforce and unfair competition, which is made possible just by paying too low wages for work.

Although it is difficult to find an ideal level of minimum wage, which would be accepted by employees as well as employers and at the same time, it would not cause distortion on labour market (or even in the whole economy), adequate attention should be paid at least to a development of minimum wage. Establishment of the minimum wage institute is a result of the whole-society consensus, and all efforts should be directed at providing maximum added value that this institute may bring from the viewpoint of the socially protective as well as the economic-criterial function.

In this chapter, an attention will be paid to development of minimum wage and its relation to other indicators, minimum wage is compared with the most often in advanced countries. The first part will look into the minimum wage development in the Czech Republic in the last 25 years, in relation to average wage and also in relation to the gross monthly wage median. The second part of this chapter will be aimed at international comparison of the minimum wage level.

1.1 Development of minimum wage in the Czech Republic

Minimum wage level is most often assessed using the so-called Kaitz index (Kaitz, 1970), which introduces a proportion of minimum wage set by law and average wage in economy. Development of minimum wage, average wage and Kaitz index is shown in Image 1. It is clear from the image that in the Czech Republic, there are long periods of stagnation of minimum wage that change with periods of its fast growth. Those periods moreless correspond with a political situation, resp. economic priorities of the governments. Regarding supply and demand of labour market, however, such development is not acceptable. From the position of workforce, in the periods of stagnation of minimum wage, the whole-society consensus about the role of minimum wage is set aside in the Czech Republic. On the other hand, in periods of fast and unpredictable growth of minimum wage, costs of
wages on employers side grow very fast, which may – at least in a short-term horizon – put their position on their market with products at risk. Development of minimum wage in the Czech Republic also shows that not even the enormous growth of minimum wage in the past years is not adequate to maintain a steady proportion on average wage in economy. Even in 2017, minimum wage did not reach the 40 % of average gross monthly wage.

**Image 1: Development of minimum wage and average gross monthly wage in the Czech Republic in 1993-2017**

Valuation of a minimum wage level using the Kaitz index is, however, problematic because of the relationship of minimum wage and average wage in economy. **Average wage** reflects a character of wages division in economy and is influenced by extreme figures. This is
why it is necessary to compare minimum wage and statistical characteristic, which is not influenced by extremes on an upper or lower end od wages division. For those purposes, international comparison use the middle value in a form of median, which divides an organized line of figures into two halves (that is 50 % are higher or equal the median and 50 % figures are lower or equal the median). **Development of a proportion of minimum wage on median** of gross monthly wage and average wage in the Czech Republic is shown in Image 2. It is clear from the picture that until the last economic crisis, median and average oscillated around very close figures. Wages division started to change in the Czech Republic after economic crises, which was reflected in a relationship to minimum wage by a higher proportion of minimum wage on median compared to a proportion in average wage. The proportion of minimum wage on gross monthly wage median reached **41 % in 2017**.

*Image 2: Development of a minimum wage proportion and average gross monthly wage or gross monthly wage median in the Czech Republic in 1993-2017*

Note.: Average gross monthly wage in 1993-1999 corresponds to average gross monthly wage of employees in national economy without under-limited economic subjects. In years where minimum wage increased during the year (in 1999, 2000, 2006 and 2013), there is the higher value of minimum wage. Source: MPSV (minimum wage), ČSÚ (average wage), OECD (proportion of median in 1993-2009), vcalculations of TREXIMA. Data valid on 25. 6. 2018.
Monitoring the level of minimum wage in relation to the gross monthly wage median is more suitable not only for limiting the impacts of extreme numbers or extreme development of wages division, but also from conceptual viewpoint. Median has become the initial characteristic also when calculating a boarderline of income poverty, which is based on investigation methodology Living conditions (EU-SILC) harmonized on the EU level. Median is therefore a **standardly used characteristic**, the benefits of which were agreed by the authorities that do statistic service across developer countries.

### 1.2 International comparison

The minimum wage institute is modified in the legislation of most countries all over the world. The aim of this part is therefore to show a level of minimum wage compared to average wage and wage median in selected countries, which – based on the whole-society consensus – just like the Czech Republic – accepted the minimum wage institute and decided to use the social-protective and economic-criterial function of minimum wage.

The proportion of minimum wage and average wage in given economy is shown in Image 3. It is clear from the picture that the **Czech Republic** belongs to **countries with the lowest proportion of minimum wage on average wage**. Lower numbers in a group of selected countries are only in the USA (typical for greater liberality) and Spain and Greece from European countries (which have, on the other hand, many structural problems). Much greater proportion of minimum wage on average wage have European countries that established minimum wage at the end of millenium or recently (Great Britain, Germany).

Position of the Czech Republic remains similar even on a list organized according to the proportion of minimum wage on the gross wage median in given economy. Picture 4 shows that **lower proportion of minimum wage on wage median** is recorded only in the USA and Spain.

Comparing the lists according to the proportion of minimum wage on average wage as well as the wage median provides important information not only about a position of minimum wage in given economy but also about a structure of wages, especially in the second half of wages division. Countries with **similar numbers of median and average** are characteristic by **even division of wages**. Countries that **lead the charts** (for example France or Slovenia) have **less space for the differentiation of wages** of the bottom part of the division of wages. In another words, the range of wages does not have to be high enough for the employers to be able to differentiate wages among individual employees according to their qualification, quality of their work and other factors, which are reflected in wages indirectly, too (for example loyalty to their employer, active approach to solving problems etc.). One unintended effect of similar development in respect of wages can then be a **greater feeling of unfairness** of employees **regarding their wages** compared to wages of the less qualified or less productive employees.
**Image 3: Proportion of minimum wage and average gross monthly wage in selected countries in 2016**

<table>
<thead>
<tr>
<th>Country</th>
<th>Minimum Wage</th>
<th>Average Gross Monthly Wage</th>
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<tbody>
<tr>
<td>Francie</td>
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<tr>
<td>Slovinsko</td>
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<tr>
<td>Lucembursko</td>
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<td>Polsko</td>
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<td>Litva</td>
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<td>Belgie</td>
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<td>Portugalsko</td>
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<td>Rumunsko</td>
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<td>Velká Británie</td>
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<td>Lotyšsko</td>
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<td>Irsko</td>
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<td>Řeco</td>
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<tr>
<td>Španělsko</td>
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<tr>
<td>USA</td>
<td></td>
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</tr>
</tbody>
</table>

**Source:** OECD, processed by TREXIMA. Data valid on 25.6.2018. **Note:** France, Slovenia, Luxembourg, Poland, Lithuania, Belgium, Portugal, Germany, Romania, GB, Latvia, Hungary, Slovakia, Ireland, the Netherlands, Estonia, the Czech Republic, Greece, Spain, the USA
Picture 4: Proportion of minimum wage and gross monthly wage median in selected countries in 2016

Source: OECD, processed by TREXIMA. Data valid on 25. 6. 2018. Note: France, Slovenia, Portugal, Romania, Luxembourg, Poland, Lithuania, Hungary, Latvia, Belgium, Great Britain, Greece, Slovakia, Germany, Ireland, the Netherlands, Estonia, the Czech Republic, Spain, the USA.
2 Work with low income

Besides its protective functions, minimum wage can also influence a structure of workplaces in economy. The influence of the minimum wage institute in this respect will, however, be seen in a long-term horizont, and it is not always possible to make a difference between the influence of minimum wage and other factors. When increasing minimum wage, a primary motive, regarding the influence of the structure of economy, is an assumption that a higher level of minimum wage eliminates the existence (and also coming to existence) of bad quality, badly paid positions, and on the contrary, it will support new vacancies for workers with higher (or desirable at the time) qualifications.

In the Czech Republic, there have recently been discussions about setting up a level of minimum wage and about its relation to productivity of work, and at the same time also a structure of economy in global sense. Considering that in the past years, minimum wage was increased in jumps, one of the main aims of the chapter will be to show what impacts this development had in respect of a number of workers remunerated by low income. In another words, this chapter will deal with the structure of badly paid positions, and it will assess the influence of minimum wage in this respect.

In international practise, low income is defined in different ways. When assessing the influence of minimum wage on a number of workers remunerated by low income, there will be two definitions used in this chapter. The first part of the chapter will be dedicated to employees remunerated by inimum wage, and we will use a process described in the certified methodology (see Duspivová and col., 2013). The second part will be aimed at low income, which will be defined in accordance with the methodology of Eurostat and OECD as a gross monthly income lower than two thirds of the median of gross wage in given year. A reason why attention is paid to both concepts is different information value of the results. A number of people remunerated by minimum wage says something about a number of people remunerated by the lowest money accepted by the law, whereas a number of people with low income provides information about division of wages in the lower bottom of wages division. After a jumpy increase of minimum wage, labour market changes in several waves. First, there is cumulation of people on minimum wage level and only the, there is a shift of wages division to the right (pouring effect). Increasing wages above minimum wage level, however, does not happen in such extent and there may be cumulation of people in the area of flow incomes (see e.g.. Dickens and col., 1994).

2.1 Employees remunerated by minimum wage

Proportion of employees remunerated by minimum wage reflects a situation on Czech labour market regarding a proportion of the worst paid jobs. A situation in the individual
sectors of Czech economy in 2017 is shown in Image 5. It is clear from the picture that the highest proportion of job positions with the lowest possible remuneration is in the area of accommodation, catering and hospitality (section I of classification CZ-NACE). In 2017, there were more than one fifth of workers in this sector remunerated by minimum wage. Position of the sector has not improved even after many arrangements implemented in connection with financial administration (for example cash registers), and it can be still assumed that there is a part of wage of the employees is not declared. In the opposite case, there would be a huge imbalance on Czech labour market and the workers should – according to economic theories – transfer to better paid positions. A proportion of workers remunerated by minimum wage is much lower even in the sectors characteristic by a higher proportion of people with lower qualification (e.g. section F – construction, or section G – wholesale and retail and repairs and maintenance of motor vehicles).

Image 5: Proportion of employees with minimum wage in individual sectors in 2017

Note.: Sections of classification CZ-NACE are also included in table I in the attachment. Calculated according to the certified methodology The influence of the minimum wage institute of socially economic development of the Czech Rep., [http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf](http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf)

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.

In respect of remunerating employees, a big role is played not only by a sector (and a position of this sector in national and global economy) but also a size of an economic subject. Bigger economic subjects are able to achieve higher savings, therefore also higher
productivity of work is characteristic for them. Thanks to that, they can remunerate their employees with higher wages, compared to smaller companies. A more advantageous position of bigger economic subject is then reflected also in a relationship to minimum wage. As shown in Image 6, with a growing size of economic subjects, there is a decreasing proportion of employees remunerated by minimum wage. Whereas in companies in 50 and more employees, there were about 1 % of employees remunerated by minimum wage in the Czech Republic, in companies with less than 10 employees, it was 18 % of workers. More advantageous economic background of digger subjects is positively reflected also in respect of a level of employees remuneration.

Image 6: Proportion of employees remunerated by minimum wage in the site categories of economic subjects in 2017

![Image 6: Proportion of employees remunerated by minimum wage in the site categories of economic subjects in 2017](image6.png)


Source: ISPV (MPSV), calculated by TREXIMA. Data valid on 25. 6. 2018.

Concerning a proportion of employees remunerated by minimum wage according to sectors, a relation to educational structure in the individual sectors was indicated. Image 7 extends this view and proves that with higher Education, a proportion of people remunerated by lower wage really decreases. While in a group of the university educated employees,
every 52nd employee is remunerated by minimum wage, in a group of people with elementary education, minimum wage is given to every 11th employee.

*Image 7: Proportion of employees remunerated by minimum wage according to the highest achieved Education in 2017*


From the left: Primary and unfinished/Secondary without maturita/secondary with maturita/university

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.

Influence of achieved education is also reflected in a structure of people remunerated by minimum wage according to the main employment classifications CZ-ISCO. Image 8 shows that the lowest acceptable remuneration for work is most often paid to the assistant and unqualified workers (9th main employment class of CZ-ISCO). In 2017, there were 15 % of assistant and unqualified workers remunerated by minimum wage. An above-average proportion of employees remunerated by minimum wage was identified for workers in services and sale in 2017 (5th main class with 9 % of workers with minimum wage), qualified workers in agriculture, forestry and fishing (6th main class with 6 % of workers with minimum wage) and officers (4th main class with 5 % workers with minimum wage).
The minimum wage remuneration applies the least to positions that require higher qualification. Low proportion of employees with the lowest acceptable wage in the Czech Republic was characteristic for management workers (1st main class), specialists (2nd main class) and technical and specialized workers (3rd main class), for craftsmen and repairers (7th main class) and machine and equipment operators and assemblers (8th main class). Low proportion of people remunerated by minimum wage for those employments is influenced not only by conditions of Czech economy but also an existence of guaranteed wage (therefore legally set up price of work reflecting its difficulty, responsibility and strenuousness – see § 112 of the Act no. 262/2006 Coll., the Labour Code).

*Image 8: Proportion of employees remunerated by minimum wage in the main employment classes CZ-ISCO in 2017*

Note.: Main employment classes of classification CZ-ISCO are defined as follows: 1 management workers, 2 specialists, 3 technical and specialized workers, 4 officers, 5 workers in services and sale, 6 qualified workers in agriculture, forestry and fishing, 7 craftsmen and repairers, 8 machine and equipment operators, assemblers, 9 assisting and unqualified workers. Calculated using certified methodology Influence of the minimum wage institute on socially economic development in the Czech Rep., [http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf](http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf)

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.
Impacts of increasing level of minimum wage on the number of employees remunerated by the lowest income is illustrated in Image 9. The image shows development of a proportion of employees remunerated by minimum wage in the individual main employment classes of classification CZ-ISCO in 2010-2017, and therefore illustrates development of economic crises over to a period of economic growth. Decreasing proportion of people remunerated by minimum wage was at the beginning of monitored period (that is in 2010-2012) influenced by several factors. During economic crises, the employees with low qualifications were first to be dismissed or those with short practical experience who were given the lowest wages. However, another important reason is also stagnation of minimum wage. In Czech economy, wages continuously increase even without increasing minimum wage, which was also reflected in a decrease in a proportion of people remunerated by minimum wage. But this only attempts to hide the fact that those workers still remain trapped in low incomes, although they do not get minimum wage any more (see the following part concerning people with low incomes).

Image 9: Development of the proportion of employees remunerated by minimum wage in the main employment classes CZ-ISCO in 2010-2017

1 management workers, 2 specialists, 3 technical and specialized workers, 4 officers, 5 workers in services and sale, 6 qualified workers in agriculture, forestry and fishing, 7 craftsmen and repairers, 8 machine and equipment operators, assemblers, 9 assisting and unqualified workers

Source: ISPV (MPSV), calculations by TREXIMA. Data valid on 25. 6. 2018.

In 2013, minimum wage increased, which was also reflected by an increase in a proportion of people remunerated by minimum wage in all main employment classes. Decrease of the proportion in 2014 was caused by recovery of Czech economy (and growing total level of remuneration) and stagnation of minimum wage on the level of 2013. During 2013, there was an apparent pouring effect (that is increasing wages above the minimum wage level to at least partially maintain a difference between productivity of individual employees).

Last period illustrated on the image above corresponds with a period of faster increase of minimum wage. In this period, there is a further increase in the proportion of employees remunerated by minimum wage. The first people who brought attention to the phenomenon were Meyer and Wise (1983), and it was confirmed in many developer countries, too. According to Meyer and Wise, after increasing minimum wage, deformation of wages division occurs, as close to minimum wage, there is cumulation of employees who received lower wages than existing minimum before, and now wages increased to the minimum. Empirical results in the Czech Republic show that if minimum wage increases in jumps, there is no shift of the wages division to the right. The pouring effect is not fast enough and there is a change in a proportion between productivity of workers and their wages.

In connection with economic development, there is an insufficient qualified and unqualified workforce often mentioned in the past years. Labour market in the Czech Republic is exhausted, which is also confirmed by an extremely low number of unemployed people. In times, there is not enough workforce on local labour market, the need of foreign workers is emphasized. As illustrated in Image 10, arrival of foreign workers is an ad hoc reaction to the existing situation in Czech economy. On one hand, foreign workers will resolve the existing shortage of workforce, but on the other hand, it is not a systematic solution considering the efforts to change the structure of Czech labour market towards better and more qualified professions. It is clear from the image that nationalities which are a subject of a more complicated process in terms of obtaining work permit for longer stay are placed to lower quality and badly paid positions. An example can be e.g. people from Ukraine, as people who were remunerated minimum wage made 10 % of Ukrainian employees in the Czech Republic. An above-average proportion of employees remunerated by minimum wage was identified in case of people from Bulgaria, and there were 6 % of Bulgarian employees employed in the Czech Republic in 2017.

There was an opposite situation in case of situation of Polish and Slovak people. It becomes apparent that employees of these nationalities migrate especially for higher income – nevertheless, migration pays off for these nationalities for medium or highly qualified
employees (contrary to Ukrainian or Bulgarian employees, for whom, due to economic aspect, it pays off to do even unqualified work in the Czech Republic irrespective of their original qualification). This also corresponds with a low proportion of people remunerated by minimum wage in a group of Polish (3 %) or Slovakian (4 %) workers.

*Image 10: Proportion of employees remunerated by minimum wage according to citizenship in 2017*


From the left: Czech Rep., Slovakia, Poland, Romania, Bulgaria, Ukraine, other

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.

### 2.2 Employees with low income

Analysis of a proportion of people remunerated by minimum wage provides information about the influence of minimum wage of the people who this remuneration by minimum wage directly concerns. As already indicated above, foreign research clearly shows that increasing minimum wage is also seen in case of employees with higher income. Machine and col.
(2002) managed to quantify in case of Great Britain that minimum wage influences wages divisions up to the 4th decile (it therefore influences wages of 40 % employees in Great Britain). That is why it is necessary to extend the analysis to a larger group of people who can be influenced by increasing minimum wage.

International research uses an indicator of wage gap to examine the effects of an introduction or an increase of minimum wage on wages division (that means gaps between selected quantiles, most frequently between the median and the 1st decile or between the 9th decile and the median). In case of the Czech Republic, it is obviously possible to monitor the developments of the indicator, nevertheless, on the contrary to western countries, conclusions made on the basis of wage gap are hard to justify. Besides the hardly quantifiable demonstrations of economic cycle and methodical changes in structural investigation of wages, there is an important role played by the ceasing transformation of Czech economy. One of the typical demonstrations of economic transformation is an increase in the variability of wages, and therefore income uneveness (see Milanovic, 1998, Grün and Klasen, 2000). This is the reason why the change of wage gap cannot be attributed exclusively to a change of minimum wage rate, and it is not possible to use any standard models (see Duspívová and Matějka, 2013).

Considering the existing limitations in transition economies, the assessment of the minimum wage impacts will be carried out using the indicator of a number of people with low income. Low income will be defined in accordance with the methodology of Eurostat and OECD as a gross monthly income lower than two thirds of the gross wage median in a given year.

The results of 2017 show that low incomes were given to 20 % of employees in the Czech Republic. The proportion of people with low incomes is therefore 5 times higher than a proportion of people remunerated by minimum wage (4 % of people in 2017). Also this result shows that analyses based only on a number of people remunerated by minimum wage cannot provide a full picture of low incomes.

A proportion of people remunerated by low wages in the individual sectors in the Czech Republic in 2017 is illustrated in Image 11. It is clear from the picture that the situation from the point of employee remuneration remains hopeless in some sectors in the Czech Republic even after increasing minimum wage. In the sector of accommodation, catering and hospitality (section I of classification CZ-NACE), there were 66 % of employees in 2017 remunerated by wages below 17 895 CZK (that is wage lower than 2/3 median of gross monthly wage in 2017). Very high proportion of people with low incomes was also identified in sectors of administration and assistance work (section N), other work (section S) and work in the area of real estate (section L). There were more than one third of employees with low incomes in those sectors.

However, there are also sectors in the Czech Republic where a proportion of people with low income is very low, and it doesn’t often reach a level of a proportion of people with minimum wage in the Czech Republic (4 %). These sectors include especially banking and insurance (section K), mining and excavation (section B), production and distribution of
Low proportion of employees with low incomes in 2017 was characteristic also for processing industry (section C), which is a sign of good conditions of Czech industry and pressure on higher wages, which is yet higher due to a shortage of workforce.

*Image 11: Proportion of employees remunerated by low wages in individual sectors in 2017*

**Note:** Names of the sections of classification CZ-NACE are also included in Table I in the attachment. Low income is defined in accordance of methodology of Eurostat and OECD as gross monthly income lower than two thirds of gross monthly wage median in the Czech Republic in given year. Calculation is done using certified methodology Influence of the minimum wage institute on socially economic development in the Czech Republic, [http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf](http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf)

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.

Just like in case of a proportion of employees remunerated by minimum wage, for a proportion of people with low income, an important role is played by a sector and its position in Czech economy but also a size of economic subject. Image 12 illustrates a proportion of
people remunerated by lower wage than two thirds of gross monthly wage median in the Czech Republic in 2017 (17,895 CZK). Even in case of people with low income, it is apparent that **with growing size of economic subject, a proportion of people with low income decreases**. While for the largest economic subject, a proportion of people with low income moved around 5 %, for subjects with less than 10 employees, this proportion was 55 %. In other words, more than a half of employees in the smallest companies received gross monthly wage lower than 17,895 CZK in 2017.

*Image 12: Proportion of employees remunerated by low wage in the size categories of economic subjects in 2017*

Note.: Low income is defined in accordance with the methodology of Eurostat and OECD as a gross monthly income lower than two thirds of gross monthly wage median in the Czech Rep. in given year. Calculation is done using certified methodology Influence of the minimum wage institute on socially economic development in the Czech Rep., [http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf](http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf)

Source: ISPV (MPSV), calculations of TRESPIMA. Data valid on 25. 6. 2018.
Education plays a big role in the Czech Republic. Picture 13 therefore shows a proportion of people with low income in the Czech Republic in 2017 in the individual educational categories. It is clear from the picture that as level of education grows, proportion of people with wages lower than two thirds of the median decreases. In 2017, there were 7 % employees with university education, 16 % of employees with secondary education with maturita, 29 % employees with secondary education without maturita and 40 % employees with elementary or unfinished education who received gross monthly wages lower than 17 895 CZK. In this respect, investment into higher education pays off even in the Czech Republic, as low education significantly increases a chance of flow income.

Picture 13: Proportion of employees remunerated by low wages according to the highest achieved education in 2017

Note.: Low income is defined in accordance with the methodology of Eurostat and OECD as a gross monthly income lower than two thirds of gross monthly wage median in CZ in a given ear. The calculation is done using certified methodology influence of the minimum wage institute on socially economic development of the Czech Republic, http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf

From the left: Primary and unfinished/Secondary without maturita/secondary with maturita/university

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.
A relation of a remuneration level to performed employment is illustrated in Picture 14. It is clear from the picture that employees who are in employment that requires higher qualification do not receive low incomes as often as people working on positions with lower qualification demands. In 2017, low income (that is gross monthly wage below 17 895 CZK) was paid most often to assistant and unqualified workers (9th main class of the classification CZ-ISCO). Every second assisting and unqualified worker was remunerated by low income in the Czech Republic. In 2017, low incomes were typical for workers in services and sale (5th main class), is there were 46 % of the workers receiving gross monthly wage lower than 17 895 CZK.

In 2017, there was an opposite situation for mental or manual jobs, which require higher qualification. Low incomes occurred in less than 10 % of management workers (1st main class), specialists (2nd main class) and technical and specialized workers (3rd main class). For manual professions requiring higher qualification, low incomes were more frequent compared to qualified mental professions, nevertheless, even here were identified main employment classes, where a proportion of employees with low incomes was under average in 2017. Lower proportion of employees with low income compared to an average for the whole Czech Republic, were recorded for craftsmen and repairers (7th main class) and machines and equipment operators and assemblers (8th main class) in 2017.

*Picture 14: Proportion of employees remunerated by low wages in the main employment classes CZ-ISCO in 2017*
Note: Low income is defined in accordance with the methodology of Eurostat and OECD as a gross monthly income lower than two thirds of gross monthly wage in the CZ in a given year. Main employment classes of the classification CZ-ISCO are defined in the following way: 1 management workers, 2 specialists, 3 technical and specialised workers, 4 officers, 5 workers in services and sale, 6 qualified workers in agriculture, forestry and fishing, 7 craftsmen and repairers, 8 machine and equipment operators, assemblers, 9 assisting and unqualified workers. Calculations are done in accordance with certified methodology Influence of the minimum wage institute on socially economic development in the Czech Republic, http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.

Influence of minimum wage on a proportion of people with low incomes in the individual main employment classes is illustrated in Picture 15. It is clear from the image that the proportion of people with low incomes in most main classes usually stagnated during the monitored season, or even slightly increased. An exception is main classes that were already mentioned in the previous part in connection with very high proportion of employees with low incomes. In the last 2 years, proportion of people with low incomes decreased for assisting and unqualified workers (9th main class) by 2 p.b. and for workers in services and sale (5th main class) even by 7 p.b. This development indicates gradual straightening of wage conditions for those employments, nevertheless, there is a question of how much we can see the impacts of increasing minimum wage or general pressure to increase wages in economy due to insufficient workforce. The results therefore indicate that minimum wage does not bring any immediate solution because of a delayed reaction of the subjects in question even in the time period of economic growth, and therefore, it is not a suitable tool for a fast decrease of poverty in society (e.g. Stigler, 1946, Dolado and col., 1996).
Picture 15: Development of proportion of employees remunerated by low wage in the main employment classes CZ-ISCO in 2010-2017

Note.: Low income is defined in accordance with the methodology of Eurostat and OECD as a gross monthly income lower than two thirds of the gross monthly wage median in CZ in a given year. Calculation is done using certified methodology influence of the minimum wage institute on social economic development in the Czech Republic, http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf

1 management workers, 2 specialists, 3 technical and specialised workers, 4 officers, 5 workers in services and sale, 6 qualified workers in agriculture, forestry and fishing, 7 craftsmen and repairers, 8 machine and equipment operators, assemblers, 9 assisting and unqualified workers

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.

Just like employees remunerated by minimum wage, also the low-income employees are monitored for a proportion of he people according to citizenship. Image 16 illustrates that workers with Ukrainian and Bulgarian citizenship belong to the the worst remunerated nationalities employed in the Czech Republic. On the other hand, Slovaks and Polish people employed in the Czech Republic in 2017 recorded the lowest proportion of people with low incomes. Gross monthly wage below 17 895 CZK was given only to 16 % of Slovaks, resp. 17 % of Polish people working in the Czech Republic in 2017.
Image 16: Proportion of employees remunerated by low wages according to citizenship in 2017

Note.: Low income is defined in accordance with the methodology of Eurostat and OECD as a gross monthly income lower than two thirds of gross monthly wage median in the Czech Republic in a given year. Calculation is done using certified methodology Influence of the minimum wage institute on socially economic development in Czech R., http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf

Czech Rep., Slovakia, Poland, Bulgaria, Ukraine, other
Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.

2.3 International comparison

Frequency of employees with low incomes in selected countries is illustrated in Image 17. It is clear from the image that the Czech Republic belongs to the countries with a higher proportion of people with low incomes in European context.
Image 17: Proportion of employees remunerated by low wages in selected countries in 2016

Latvia, the USA, Romania, Ireland, Poland the Czech Rep., Hungary, Great Britain, Slovakia, Germany, Greece, Austria, Spain, the Netherlands, Portugal, France, Denmark, Italy, Finland, Belgium

Note: Low income is defined in accordance with the methodology OECD as a gross income lower than two thirds of a gross wage median in a given country. Due to insufficient data for Belgium, data from 2015 were used and for France, Latvia, the Netherlands, Slovenia, Spain and Romania from 2014.

Source: OECD, processed by TREXIMA. Data valid on 10. 7. 2018.
3 Poverty and minimum wage

On the offer side of labour market, minimum wage should fulfill two primary functions – firstly, it should ensure for the incomes of employees not to fall under a generally accepted level (the so-called socially-protective function of minimum wage) and also, it should be motivating enough for the employees to an active approach to productive activity, that means that compared to a passive approach based on receiving social security benefits, it should be economically more beneficial than going to work (the so-called economic-criterial function of minimum wage). Theoretical understanding of both functions of minimum wage is often the main reason why minimum wage exists in many developed and less developed countries (and is introduced in other ones). Long-term experience of many countries regarding minimum wage shows that the minimum wage institute is able to fulfill its functions in limited range, as it is influenced by other institutions. This is also illustrated in Table 1, which also confirms that the minimum wage institute is a suitable example of arrangements which have high aims but fail in practise (for example Sunstein, 1997, Friedman, 1962).

Explanation of a role of institutions which are not successful in empirical research in economic parameters, and although they are accepted in society, is offered a political model. The aim of this political model is to unite two absolutely different views – a significantly empirical views, in which categories of benefits and expenses are compared (quantifiable through economic indicators), and normative view, where the arguments for and against implementing minimum wage are more philosophical. In case of minimum wage, the result is a question of choice between the two – often contradicting – positions.

The area of political models includes also institutional economy, which investigates a role of institutes in economy. Therefore, it does not examine only economic processes that appear within institutional arrangement but also an overall framework created by formal (e.g. laws) and informal institutions (for example habits or culture). Institutions are created by a system of laws, behaviour norms and social habits, which are a result of collective decision making. Individuals and companies then consider – when they make decisions - these institutions for given and respect them. The institutions appear in a process of public elections and they are therefore a side product of political process. Boeri and van Ours (2008) present three reasons why an institution like minimum wage functions even in modern society and voters have not requested its cancellation\(^1\). The reasons why minimum wage still exits are the following:

1. **Effectivity.** Functioning of the real labour market is very far from the assumptions of perfectly competitive labour market due to asymmetric information and externalities.

\(^1\) See the theory concerning a rational (Wittman, 1995, Caplan, 2007) or a median voter (Black, 1948, Downs, 1957) etc.
Suitable institutions can then repair market failure and in ideal case, make the economic pie bigger compared to the laissez-faire approach (that is free market with no state intervention).

2. **Evenness.** Institutions change allocation of excesses between a producer (employer) and a consumer (employee). Final division of resources can then be perceived as fairer by society.

3. **Failure of politics.** Considering the redistribution of transactions, we may come across situations when an influential minority misuses their position against majority. An example may be an institution which is beneficial only for a limited number of subjects, but its costs are paid by public. This explanation is closely connected with the theory of the groups of interest.

In case of the minimum wage institute, there is an important role of the political-economic cycle model combined with the utilitarian theories (and their applications in economy). At present, many economies are tied with political cycle. Current models are based on the Nordhaus model of political-economic cycle (*political business cycle*). Nordhaus (1975) assumes that the main aim of a politician is his re-election (and therefore introducing the kind of economy that will give him maximum number of votes in next elections). Irrespective of monitored elements\(^2\), the main idea of this model lies in *cyclicity of economical politics* – after economical politics at the beginning of voting period, expansion occurs right before elections. If we leave out the often criticised assumption of the existence of myopic voter, the Nordhaus model brings a new look at the political-economic decisions.

Nordhaus (1975) points out especially the short-sightedness of some decisions – preferable are those for a disadvantage of future generations (important investments are undervalued, as voters prefer lower taxation, higher transfers or common expenses). Arrangements are therefore short-term, just like the assessment of possible impacts. Assessment of possible impacts, whether they are measurable or not, should be done in a short as well as a long time period, irrespective of political interest of economy politics creators. Piore (1995) therefore recommends to pay attention especially to long-term structural politics and not to monitor development of macroeconomic aggregates only short-term. **Existence of political cycle** is also one of the reasons why minimum wage does not fulfill its two functions completely (similar to other countries) in the Czech Republic.

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\(^2\) In the Nordhaus (1975) model, a politician chooses between inflation and unemployment, that is model uses the Phillips curve (Phillips, 1958).
**Table 1: Assessment of minimum wage impacts in selected theoretical models vs. empirical evidence**

<table>
<thead>
<tr>
<th>Selected areas where impacts of minimum wage will show</th>
<th>Neoclassicist model</th>
<th>Company influencing amount of incomes</th>
<th>Empirical evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Homogenous work</td>
<td>2 discrete types of work</td>
<td>Monopson</td>
</tr>
<tr>
<td></td>
<td>Human capital theory</td>
<td>2-sector model</td>
<td>Setting even wage</td>
</tr>
<tr>
<td>Wages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenced workers</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Other workers</td>
<td>Zero</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Employment</td>
<td>Negative</td>
<td>Negative</td>
<td>Positive or negative</td>
</tr>
<tr>
<td>Influenced workers</td>
<td>Negative</td>
<td>Negative</td>
<td>Positive or negative</td>
</tr>
<tr>
<td>Other workers</td>
<td>Unsure</td>
<td>Zero</td>
<td>Positive or unsure</td>
</tr>
<tr>
<td>Wages divisions</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Spike on minimum level</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Spillover effect on workers with higher wages</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, in limited range</td>
</tr>
<tr>
<td>Decreased rate of minimum wage</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Companies use a decreased rate of minimum wage</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Production prices</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Production of influenced workers</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative or positive</td>
</tr>
<tr>
<td>Company profits</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative or positive</td>
</tr>
<tr>
<td>Profit of employers of influenced workers</td>
<td>Slightly negative</td>
<td>Slightly negative</td>
<td></td>
</tr>
</tbody>
</table>

Note: **Influenced workers** are workers who – before introducing of minimum wage – had lower wages than current minimum, and at the same time they work in branch where legally set minimum applies. **Other workers** are those with higher wages than current minimum, or they work in branch where laws on minimum wage do not apply. **Dash** is for cases when the model does not deal with the issue.

3.1 Boarderline of income poverty and net minimum wage

Discussion about a role of minimum wage is, in the Czech Republic, influenced by political cycle and a choice of indicators by which the effectivity of minimum wage is assessed. At present, there is no consensus of whether he impacts of minimum wage should be assessed by quantitative indicators or whether to use also a set of qualitative ones. For quantitative and qualitative indicators, however, it is important to resolve the so-called adequacy problem, when during a process, it is necessary to verify the model and add it to the often vague economic terms to a statistical indicator. However, statistical indicators do not have to (and it often is not) fully match the economic term and the authors have to cope with the so-called adequacy problem (see Fischer and Sixta, 2009). When choosing indicators, this problem is often forgotten and qualitative indicators are – often without a good reason – considered to have lower quality, although even the quantitative indicators can fail significantly for the ability to implicitly record the problematics in question.

The problematics of adequacy problem can be illustrated on a relationship between minimum wage and poverty. One of the functions of minimum wage is to provide acceptable level of incomes for employees (see above) – and this level of income is often approximated by poverty indicators. Assessing the relationship of minimum wage and poverty is often done by comparing the absolute level of minimum wage and a boarderline of income poverty. However, in case of the Czech Republic, we forget the fact that minimum wage is defined in law as a gross term, whereas a boarderline of income poverty is quantified in net numbers.

Differences between minimum wage and boarderline of income poverty of a household of an individual are therefore higher in reality compared to how they are often interpreted. Image 18 shows that a difference between net minimum wage and a boarderline of income poverty of a household of an individual does not exceed 3 thousand CZK for a long time. In this respect, however, it is important to emphasize that „the relationship between a boarderline of income poverty and a level of minimum wage is only mediated. The boarderline of income poverty is set up for all households irrespective of their participation on labour market and for all their incomes (that is also for incomes from business, statutory sick pay, social benefits, scholarships, rents etc.)“ (see Brázdilová and col., 2016). When trying to assess the fairness of remuneration, the adequacy problem appears more and more intensely. Quantification of fairness is not easy, as it is a sociological problem which is hard to measure. Moreover, in Czech conditions, evenness and egalitarianism are often exchanged, and Galvas and col. (2010) point out that those are not identical categories. When assessing the relationship between poverty and minimum wage, it is therefore necessary to deal with a range of definition problems, just like many problems related to quantification and comparability of individual indicators.
3.2 Working poor people in European context

Valuation of socially-protective function of minimum wage is problematic only when considering a base of a relationship of employees with the lowest incomes and the poorest households. Those who are remunerated on a minimum wage level usually do not come from the poorest families, therefore by introducing minimum wage, poverty will not be limited significantly. This can be agreed with, as the most frequent cause of poverty is unemployment\(^3\) (see Image 19).

\(^3\) This statement is also confirmed by the results of a survey Quality of life in Europe (European Quality of Life Survey, EQLS). It is apparent from its results that the unemployed have much lower income compared to those who have paid work – on average, the equivalized income of households where all its members are
**Note:** People endangered by poverty are people who live in households with equivalized disposable income under the poverty borderline. This borderline is defined as 60% of national median of equivalized disposable income (after social transfers).

**Source:** Eurostat, calculations of TREXIMA. Data valid on 19. 9. 2018.

Unemployed makes about half of the income of households where its members are employed. Also other EU statistics confirm that low incomes are typical for the households of women, people with lower level of education, with poor health, widowed or divorced. See more in EFILWC (2009).
From the above, it is clear that introducing minimum wage will not increase a standard of living of the unemployed. An increase of the living standard is therefore necessary – in connection with minimum wage – to assess only for the households with at least one employed member⁴. In other words, an effort to eliminate poverty in society cannot be based only on employment itself and on income from this employment. Stigler (1946) points out to possible discrimination in this case. „Assistance“ in the form of minimum wage is aimed at poor employees but opomíjí forgets the group of self-employed.

### 3.3 International comparison in terms of even division

Thanks to poverty, we can – besides the above mentioned proportion of people with incomes under the poverty borderline – monitor also by indicators based on income division in the whole society. There are three indicators that we use most frequently at present:

i. **Gini coefficient.** Gini coefficient is based on the Lorenz curve (Gini, 1912, resp. 1939, Lorenz, 1905) and its figures are between 0 and 1. Figures near zero indicate high evenness in disposable incomes division, figures close to 1, on the other hand, high unevenness in incomes division.

ii. **Palma ratio.** Palma ratio corresponds to a proportion of incomes of 10% people with the highest disposable incomes and incomes of 40% people with the lowest disposable incomes (OECD, 2018).

iii. **S80/S20.** The indicator is defined as a proportion of average disposable income of 20% people on the upper end of incomes division (people with the highest incomes) and average disposable income of 20% people on the lower end of the division (people with the lowest incomes) (OECD, 2018).

The Czech Republic generally belongs to the countries where incomes are divided more equally compared to other developed and less developed countries. In 2015, the Czech Republic belonged to the countries with the lowest figures in Gini coefficient, that is regarding disposable incomes after taxation and social transfers, there was high evenness of division (see Image 20). Evenness of division is also confirmed by Palma ratio, while a proportion of incomes of 10% people with the highest disposable incomes and incomes of 40% people with the lowest disposable incomes was lower than 1 (see Image 21). Also the proportion of people with the highest and the lowest incomes is, in international context, one of the lowest just in the Czech Republic (see Image 22). In this

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⁴ Minimum wage may be positive for specific groups of people – for example Addison and Blackburn (1999) point out possible positive impacts of minimum wage from the viewpoint of decreasing poverty of the youth and the students who have not completed secondary school successfully.
context, an emphasis is put on a role of minimum wage in the Czech Republic in respect of evenness of incomes division and it is a more theoretical problem.

*Image 20: Gini coefficient (disposable income after taxation and transfers) in selected countries in 2015*

Turkey, the USA, Lithuania, GB, Latvia, Spain, Greece, Portugal, Italy, Estonia, Canada, Luxembourg, Ireland, Switzerland, France, Germany, Poland, the Netherlands, Hungary, Sweeden, Austria, Norway, Belgium, Denmark, Finland, the Czech Republic, Slovakia, Slovenia, Iceland

Note.: There were no data available for Hungary and Iceland, so there are figures for 2014. Gini coefficient can reach figures between 0 and 1. Figures close to zero indicate high evenness in disposable incomes division, figures close to 1 indicate high unevenness in incomes division.

Source: OECD, calculations by TREXIMA. Data valid on 25. 6. 2018.
Image 21: Palma ratio in selected countries in 2015

Note: Data for Hungary and Iceland were not available, so for these countries, there are figures from 2014. Palma ratio corresponds to proportion of incomes of 10% people with the highest disposable income and incomes of 40% people with the lowest disposable incomes.

Source: OECD, calculations by TREXIMA. Data valid on 25. 6. 2018.
Image 22: Proportion of people in the 5th and the 1st quintile of incomes division in selected countries in 2015

<table>
<thead>
<tr>
<th>Country</th>
<th>S80 / S20</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>Litva</td>
<td></td>
</tr>
<tr>
<td>Španělsko</td>
<td></td>
</tr>
<tr>
<td>Řecko</td>
<td></td>
</tr>
<tr>
<td>Lotyšsko</td>
<td></td>
</tr>
<tr>
<td>Itálie</td>
<td></td>
</tr>
<tr>
<td>Velká Británie</td>
<td></td>
</tr>
<tr>
<td>Portugalsko</td>
<td></td>
</tr>
<tr>
<td>Estonsko</td>
<td></td>
</tr>
<tr>
<td>Kanada</td>
<td></td>
</tr>
<tr>
<td>Lucembursko</td>
<td></td>
</tr>
<tr>
<td>Polsko</td>
<td></td>
</tr>
<tr>
<td>Švýcarsko</td>
<td></td>
</tr>
<tr>
<td>Irsko</td>
<td></td>
</tr>
<tr>
<td>Maďarsko</td>
<td></td>
</tr>
<tr>
<td>Německo</td>
<td></td>
</tr>
<tr>
<td>Francie</td>
<td></td>
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<tr>
<td>Nizozemí</td>
<td></td>
</tr>
<tr>
<td>Švédsko</td>
<td></td>
</tr>
<tr>
<td>Rakousko</td>
<td></td>
</tr>
<tr>
<td>Norsko</td>
<td></td>
</tr>
<tr>
<td>Belgie</td>
<td></td>
</tr>
<tr>
<td>Slovinsko</td>
<td></td>
</tr>
<tr>
<td>Slovensko</td>
<td></td>
</tr>
<tr>
<td>Finsko</td>
<td></td>
</tr>
<tr>
<td>Dánsko</td>
<td></td>
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<tr>
<td>ČR</td>
<td></td>
</tr>
<tr>
<td>Island</td>
<td></td>
</tr>
</tbody>
</table>

USA, Lithuania, Spain, Greece, Latvia, Italy, GB, Portugal, Estonia, Canada, Louxembourg, Poland, Switzerland, Ireland, Hungary, Germany, France, the Netherlands, Sweden, Austria, Norway, Belgium, Slovenia, Slovakia, Finland, Denmark, CZ, Iceland

Note.: There were no actual data for Hungary and Iceland, so for those countries, there are figures from 2014. The figures are calculated as a proportion of average disposable income of 20 % people on the upper end of incomes division (people with the highest incomes) and average disposable income of 20 % people on the lower end of the division (people with the lowest incomes).

Source: OECD, processed by TREXIMA. Data valid on 25. 6. 2018.
The Czech Republic is a country typical for a low rate of income polarization, but on the other hand, it is characteristic by a high proportion of people who come across some signs of precarious work in their working lives. Minimum wage in the Czech Republic should therefore function as one of the tools used to minimize precarious work.

Precarious work can be defined in accordance with the International Labour Organization (ILO, 2011) as a form of employment relationship that is typical for its limited lasting and its contractual form is not standard. Considering time, the category of precarious work involves temporary contracts, various forms of short-term cooperation (in Czech context, for example, agreements to do work outside employment), seasonal and other occasional work. Considering its nature, precarious work can involve the forms of entering labour market which are not formally defined as employment contract but in reality, there are signs of dependant work. This category involves involuntary business, agency employment, fictive sub-supplies or employment relationships presented as business ones (e.g. in a form of contracts for works). However, besides precarious employment relationships, we can also identify working conditions that could be considered precarious. According to ILO (2011), we can distinguish 4 primary signs of precarious work:

i. Low remuneration,
ii. Low protection against termination of employment relationship,
iii. Limited access to social security system or social support compared to employees in standard, full-time employment,
iv. Limited possibility to exercise rights related to work.

But precariousness of work has to be assessed in a context of voluntarity – what is a desirable form of working relationship for one employee, may be involuntary form of joining labour market for another one. But from empirical point of view, this fact is more of a complication, as large surveys do not make it possible to assess voluntarity or involuntarity of employment relationship. In this respect, partial indicators of an extent of precarious work rather indicate a possible extent of precariousness of work, but – under current conditions – they do not allow to quantify it precisely.

Concerning the fourth industrial revolution, some new forms of precarization begin to appear, which are closely connected with development of digital technologies. Although modern forms of work still are in minority in the Czech Republic, development of new forms of work (and also precarization) cannot underestimated. In this respect, it is important to identify those forms of work on time, and also their effective regulation which would reflect workers needs in a long-term horizont (e.g. in relation to social system). Modern forms of work which are not defined optimally in Czech legislation involve for example work from home, working from distance (also from abroad), shared positions and shared economy and
platforms related to that. Each of these modern forms of joining labour market has its specifics (and also specific risks). All the mentioned forms represent a great potential for transferring technological development into social sphere, nevertheless, the potential should not be used for a disadvantage of workers themselves. Timely detection of risky features should prevent or at least go hand in hand in times of fast development.

The main goal of this part is therefore to identify the forms of precarization of work which are typical for Czech Republic. At the same time, a role of minimum wage in respect of limiting the signs of precarization will be discussed for the individual forms. Attention will be paid particularly to temporary employment, length of employment, extent of working hours, agreements to do work outside employment, existence of collective negotiation, agency employment and involuntary business. In the last part of the chapter, the results will be put into an international context.

4.1 Temporary employment

In the Czech Republic, temporary employment is one of the most significant forms of precarious work. The insecurity to do with continuing in employment in 2017 concerned 8 % of employed people. Women are employed temporarily much more often in all age categories (see Image 23).

*Image 23: People in temporary employment according to gender and age (Czech Rep., 2017)*

![Image 23: People in temporary employment according to gender and age (Czech Rep., 2017)](image)

Source: ČSÚ (VŠPS), processed by TREXIMA. Data valid on 10. 7. 2018. Grey – men, red - women
Research in this area (Hašková, 2011, Hašková and Dudová, 2017) indicates that less favourable situation of women is a result of an approach of Czech society to family (and at the same time motherhood). More frequent use of temporary employment contracts is negatively reflected not only from economic but also social position of families. A role of minimum wage is, in this respect, undiscussable, especially considering the socially-protective function of minimum wage.

4.2 The length of employment

Temporary employment is to a great extent connected with shorter time of employment. On labour market, shorter time of employment is a disadvantage especially in case of economic crises (or in case of economic problem of a specific company during any phase of economic cycle). Shorter time of employment is connected with lower (and in case of temporary employment, when fulfilling legal conditions even zero) level of redundancy payment that has to be paid by employer to employee in case of termination for reasons on employer’s side. Time of employment is also a factor which puts employees into disadvantage on labour market, and may to some extent contribute to prekarization of their position.

In 2017, there were 11% people employed less than 1 year in their existing employment, and from 1 to 3, there were 16% employed people. More than one quarter of employees worked in their position for a short time and they were endangered more than long-term employees.

Image 24 also shows that also from a viewpoint of employment, women were more at risk – there were 30% women working in the same position less than 3 years, whereas for men in the same position, it was 24% employed people.

*Image 24: Structure of employed people according to time of employment (CZ, 2017)*
Length of employment on one position also plays a significant role concerning the remuneration for work. Image 25 clearly shows that there is a much higher proportion of people remunerated by minimum wage among employees working on one position for less than five years.

Image 25: Proportion of people with minimum wage according to length of employment (CZ, 2017)


up to 1 year, 1-5 years, more than 5 years

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018.

Image 26 illustrates the situation of people working one position for shorter time from the perspective of low incomes. In 2017, the group of people with low incomes involved 28 % employees working on one position for less than one year and 25 % of employees working
on one position from 1 to 5 years. In a group of long-term employees, however, this proportion was only 15 %. **Length of employment therefore influences an amount of income**, and also economic and social stability of employees’ households. Also in case of employees disadvantaged by a shorter time of employment, a key think is **key socio-economic function of minimum wage**, which should provide acceptable remuneration for work also to the employees who just start in some position.

*Image 26: Proportion of employees remunerated by low wages according to length of employment (Czech Rep., 2017)*

![Image showing proportion of employees with low income by length of employment]

**Note:** Low income is defined in accordance with the methodology of Eurostat and OECD as a gross monthly income lower than two thirds of gross monthly wage median in the Czech Rep. in given year. Calculation is done in accordance with the certified methodology Influence of the minimum wage institute on socially economic development in the Czech Republic, [http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf](http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf)

up to 1 year, 1-5 years, more than 5 years

Source: ISPV (MPSV), calculations by TREXIMA. Data valid on 25. 6. 2018.

### 4.3 Size of employment – shorter working hours

**Part-time employment** fulfills, according to ILO (2011), a character of precarious work. Employees who work part-time are – similar to newly hired employees – dismissed more often if their company experiences some problems, and they are more often remunerated by lower wage. In the Czech Republic, shorter working hours are **typical especially for**
women in all age categories. As we can see from Image 27, in the age categories of 15 to 44 years, there were 12% women working part-time, whereas for men, this proportion was much lower. Higher proportion of women who use part-time employment in productive age is related to their role of mothers. After the age of 45, a proportion of women in shorter employment decreases, which means that women with older children can afford to start full-time employment. Number of part-time employments is growing after the age of 60 for both genders, that is in pre-retirement and retirement age. In this age category, the effect of working retired men and women (who remain on labour market voluntarily) mixes with people in pre-retirement age, who cannot work full-time for various reasons (for example medical or social).

*Image 27: Proportion of employed people who work part-time (Czech Rep., 2017)*

Part-time work can be risky in a relation to underemployment (that is a situation when a person works less hours for payment than s/he would like to). In 2017, 1% of employed people were underemployed in the Czech Republic in 2017. But as illustrated in Image 28, much more often, the feeling of insufficient amount of work was a case of people who worked part-time. Many of those people therefore worked part-time unvoluntarily.
Image 28: Structure of underemployed people according to amount of working hours (CZ, 2017)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Short Working Hours</th>
<th>Full Working Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ženy</td>
<td>11%</td>
<td>89%</td>
</tr>
<tr>
<td>Muži</td>
<td>18%</td>
<td>82%</td>
</tr>
</tbody>
</table>

Source: ČSÚ (VŠPS), processed by TREXIMA. Data valid to 10.7.2018; Line 1 – Women, line 2 – Men, grey part – full-time employment, red part – part-time employment

As already mentioned above, people who work part-time are often disadvantaged in respect of remuneration for work. Image 29 illustrates that in 2017, there was a higher proportion of employees with minimum wage identified just in the group of people in part-time employment. Image 30 then confirms that one fourth of employees who work part-time belonged to the workers with low incomes. In a group of workers in full-time employment, there was only one fifth of workers with low income.

Image 29: Proportion of employees remunerated by minimum wage according to size of employment in 2017

Left column: part-time employment, right column: full-time employment

Note.: Calculated using the certified methodology Influene of the minimum wage institute on socially economic development, Czech Rep., http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25.6.2018.
Image 30: Proportion of people remunerated by low wages according to size of employment in 2017

Left column: part-time employment, right column: full-time employment

Note.: Low income is defined in accordance with the methodology of Eurostat and OECD as a gross monthly income lower than two thirds of gross monthly wage median in CZ in given year. Calculation uses certified methodology Influence of the minimum wage institute on socially economic development in the Czech Republic, http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf

Source: ISPV (MPSV), calculations by TREXIMA. Data valid on 25. 6. 2018.

4.4 Agreements to do work outside employment

Agreements to do work outside employment (ie work and work agreements) are often used in the Czech Republic, however, immediate financial advantages are often redeemed by long-term disadvantages (eg by minimal employee protection, limited access to the social welfare system security, etc.). Picture 31 shows that in 2017 more than 225 million hours were spent in the wage sphere of the Czech Republic, which would cost more than 127 thousand jobs per year of full-time employees.
Image 31: Number of hours worked on agreements to do work outside employment (wages sphere, the Czech Republic, 2017)

Source: ISPV (MPSV), calculations by TREXIMA. Data valid on 25. 8. 2018.

Number of hours worked on agreements to do work outside employment

4.5 Absence of collective negotiation

Employees not covered by collective agreement have generally worse position on labour market – on average, they work more hours, they are typically remunerated by lower wages and lower number of employment benefits. Those employees are also less aware of their rights on labor market. Absence of collective negotiation can therefore be risky for the employees when considering possible precariousness of work. As illustrated in Image 32, employees who work in subjects not covered by collective agreement belong most often to the group of employees remunerated by minimum wage. Image 33 illustrates the situation from the perspective of low incomes, and also here, employees are at greater risk.
Image 32: Proportion of employees remunerated by minimum wage according to the existence of collective agreement in 2017


YES-NO-NOT STATED

Source: ISPV (MPSV), calculations by TREXIMA. Data valid on 25. 6. 2018.

Image 33: Proportion of employees remunerated by low wage according to existence of collective agreement in 2017

Note.: Low income is defined in accordance with methodology of Eurostat and OECD as a gross monthly income lower than two thirds of gross monthly wage median in CZ in given year. Calculation is done using certified methodology Influence of the minimum wage institute on the socially economic development in the Czech Republic, http://www.mpsv.cz/files/clanky/17709/vliv_minimalni_mzdy.pdf

Source: ISPV (MPSV), calculations of TREXIMA. Data valid on 25. 6. 2018. YES – NO – NOT STATED
4.6 Agency workers

Employment agencies can employ natural persons as fundamental employees, or they can arrange for their employees to be temporarily placed to work for another legal entity or natural person (called user)\(^5\). **Agency employees are disadvantaged compared to normal employees**, which is defined in Czech legislation, too. Employment contract, agreement to do work or a contract of future contract which an employer (employment agency) enters into with its temporarily placed employee and which s/he will produce for an application for work permit, has to contain a special provision, where the employee will agree with temporary placement. According to a legal definition of agency employment, employment agency as well as a user have to ensure that working and payment terms of a temporarily placed employee are not worse than the terms of a comparable employee. If there are worse working or remuneration conditions for a user of a temporarily placed worker during employment, employment agency is obliged to ensure the same conditions on request of a temporarily placed worker, alternatively also without request, if this fact is found out in another way. A temporarily placed worker has a right to ask employment agency to satisfy his rights, should it be necessary.

Agency employees are, on a side of Czech employers – considering the actual phase of economic cycle – still more and more desirable. Employers use agency workers to resolve a growing pressure due to insufficient workforce relatively easily and flexibly, which begins to limit production capacity of many subjects. However, for employees themselves, agency employment represents only a temporary solution, which is, in addition to that, connected with a range of undesirable effects (as for example the already mentioned **unevenness in working and payment conditions between permanent and agency workers**). Moreover, agency employees are placed on the positions of lower quality. In this respect, the **institute of minimum wage plays an important role**, as without adequate level of wages, this negative aspect of agency employment will continue to dominate in the Czech Republic.

At the end of September 2018, there were 2,062 agencies in total registered at MPSV, and 994 of them had permission to employ people and 1,628 of them had permission to search for employment and to do consultancy and information work\(^6\). A range of the problems connected with agency employment in the Czech Republic is also illustrated by **a growing number of foreign workers in a position of employees of employment agency**, who were temporarily placed to do work by the users. Image 34 clearly shows that in 2016, there were **112 thousand foreign workers** in a potentially disadvantageous position on Czech labour market, whereas in 2013, this problem concerned 50 thousand employees (which means less than a half compared to 2016).

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Agency employment is therefore connected with some other problems employers (employment agencies) themselves have to deal with. **Agency employment is often used also by people with executions** and they change their work situation to prevent their income to be cut down. Precarization of agency employment is therefore connected with some other, secondary aspects, which are manifested by frequent changes of work. Because of this aspect, it is necessary to **analyze the motives to agency employment on a supply and demand side** of labour market, not to have an unnecessary regulation of agency employment, if the cause of precarization of work lies elsewhere (and should be resolved, for example, by modifying the politics in the area of execution).

### 4.7 Involuntary business

For a long time, the Czech Republic belongs to the countries with the highest proportion of businessmen – natural persons in populations. By the end of 2017, there were 233
businessmen and 345 trade licences on every 1 000 inhabitants of the Czech Republic. By the end of 2017, there were 1,033 mil. of active private businessmen – natural persons in the Czech Republic according to organization statistics. More than 922 thousand natural persons traded in accordance with the Trade Act, 36 thousand people were agricultural businessman and 74 thousand did business according to different acts. Trade licenses are issued more often to men – in the 4th quartal of 2017, only 33 % licences belonged to women (see Image 35). Men dominate in all types of businesses except for tied businesses, which include e.g. optitians, trading animals for hobby breeding, accounting consultancy work, childcare for the up to 3-year-olds in daily reggime, maseur, condition and regeneration services or running solar studios (see attachment no. 2 to the Act no. 455/1991 Coll., of the Trade Act).

Image 35: Structure of trade licences for natural persons according to type of trade and gender in the 4th quartal of 2017

![Image 35: Structure of trade licences for natural persons according to type of trade and gender in the 4th quartal of 2017](image)

Source: MPO, processed by TREXIMA. Data valid on 25. 9. 2018. Red – women, grey – men; from the left: concessions, free trade, craft trade, tied trade, total

Although in the Czech Republic, women do business less often compared to men, in many cases, they are forced to business either by a situation in family or by former employer (Dudová and Hašková, 2014). According to ČSÚ (2018), there were 22 thousand people forced to business by their employers (it’s 3 % of businessman in 2017) in 2017. However, those people are businessmen only formally, and in fact, they are still in inferior position to their original employer. Another aspect, according to which we assess the

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existence of the so-called Schwartz system, is a number of clients. There were more than 58 thousand businessman who had only one client in 2017 (7 % businessman according to data of selective survey of workforce). For 19 % businessmen (162 thousand people), their income was completely or from 75 % dependant on one client. Problematic sectors where there is financial dependency on only one client most often or there is a pressure from employers who force employees to become dependant businessmen, include services and sale, construction, processing industry and professional, scientific and technical work. Employments at risk include craftsmen, repairers and specialists.

To have a full picture, in 2017, there were 5 % of businessman forced to have their business (47 thousand people) due to a situation on labour market, as they could not find a job as employees. Inadequate (or unsuitable) offer of dependant work is a persisting problem, which is encountered by employees on labour market in a time period of very good condition of Czech labour market. In spite of that, problems on the offer side of labour market are set aside at the moment and bigger attention is paid to the problems of the demand side (that is on a side of employers).

Precarization of work in a form of involuntary business is a problem, a solution of which cannot be reached primarily by a tool like minimum wage. A problem is, in that case, different taxation\(^8\) of the work of employees and businessmen, while it is especially the „original“ employers who benefit from the differences.

### 4.8 International context

International comparison in the area of extending precarious work gets complicated due to different definitions of the individual aspects of work precarization (ILO, 2016). In this respect, we need to compare only partial indicators (e.g. proportion of people with temporary contracts) or to use composition indicators. One of the indicators that allow to assess security and protection of workers on labour market is labour market security index (Labour Market Security Index, LMSI), used by the International Labour Organization (ILO)\(^9\).

LMSI considers setting of labour market defined by legislation and results in a form of security on labour market considering the workers. LMSI uses indicators from 3 areas:

1. Input indicators: The aim of the input indicators is to record institutional anchoring of obligations concerning provision of security on labour market. Specifically, it is the retification of the International Organization of Work Agreement no. 122, existence of government obligation to achieve „absolute employment“, existence of a

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\(^8\) In this sense, taxation is understood wider, that is tax incl. The transfers for social and medical insurance.

\(^9\) [http://www.ilo.org/sesame/SESHELP.NoteLMSI](http://www.ilo.org/sesame/SESHELP.NoteLMSI)
social security system in unemployment and legislation prohibiting discrimination according to gender when hiring workforce.

ii. Process indicators: By using process indicators we then assess **practical fulfillment of government obligations**. Partial indicators include existence of employment public services (in the area of active and passive politics of employment), proportion of public consumption on 1 person in productive age (proxy variable for importance of public sector as an employer), average interannual growth of gross domestic product and its variable coefficient (assuming that with more intense economic activity, it will be more likely to find a better quality job) and a proportion of gross production capital on gross domestic product (assuming that a higher rate of investments is connected higher production of new jobs).

iii. Outcome indicators: The aim of this group of indicators is to record **impacts of national economy politics and economic development on labour market**. Indicators are selected in order to reflect the specifics of developer and less developer countries (characteristic e.g. by a higher proportion of grey and black economy). Partial indicators in this group include unemployment rate, proportion of unemployed men and women, economic activity rate, proportion of specific employment measures according to gender, proportion of employees who receive wages on all employed people and proportion of women in this group, average interannual growth of employment in 1990s and dummy variable with figure 0 for countries that supposedly provide security for their workers but in reality it is not so (for example China or some eastern European countries).

Division of countries according to the figures of LMSI is shown in Table 2. It is clear from the table that low scores are awarded in all monitored areas of the country which generally belongs to the countries with lower legal security (e.g. Russia, Turkey or Ukraine).

On the other hand, **high score** is awarded in all monitored areas of majority of developed western countries like Belgium, Denmark, Finland, Sweden, Norway, France, Great Britain, Japan, Canada. Those countries are generally **known for their advanced social systems** – not only in a security level for workers but also in security and practical fulfillment and respecting valid legislation (enforceability of law in social-legal sphere, too).

There is a specific group of countries that reach high results from a viewpoint of practical provision of security on labour market but which fall behind in legislative sphere. Those countries include for example the USA, Switzerland and Hungary.

The Czech Republic belongs to the countries with **high goals but failures in terms of their practical fulfillment**. Those countries are typical for their high scores in entrance and process indicators, and on the other hand, low scores in terms of results. Together with the Czech Republic, this group also includes other transition economies, such as Slovakia, Poland and Hungary. Except for the transition economies, there are also the southern European countries – Spain, Italy and Greece.
Table 2: Labour Market Security Index in selected countries

<table>
<thead>
<tr>
<th>Výsledek (Outcome)</th>
<th>Low score</th>
<th>High score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vstupy a procesy (Input/Process)</td>
<td>Albania, Bulgaria, Russia, Turkey, Ukrajine</td>
<td>Australia, Hungary, Latvia, Luxembourg, New Zealand, Slovenia, Switzerland, The USA</td>
</tr>
<tr>
<td></td>
<td>The Czech Republic, Croatia, Italy, Poland, Romania, Greece, Slovenia, Spain</td>
<td>Belgium, Denmark, Finland, France, Iceland, Ireland, Japan, Canada, Germany, The Netherlands, Norway, Austria, Portugal, Sweden, Great Britain</td>
</tr>
</tbody>
</table>

Source: ILO (2004), processed by TREXIMA.
5 Digitalization and automatization of economy

The fourth industrial revolution brings (and is likely to bring in future) the unknown possibilities not only for national economy but also for the whole society. However, positive changes will be redeemed by a range of negative effects (on economical or social level\(^\text{10}\)). In connection with ongoing digitalization, automatization and robotization, there are still more and more often questions related to further use of workforce, the work of whom will be replaced by the machines in the future. At the moment, there are the following questions being discussed in the Czech Republic:

- How high is the proportion of workers, whose work will be done by the machines in the future?
- How can these workers participate and be used on labour market?
- What arrangements are necessary to be adopted at the moment to make it as easy as possible for the workers at threat to be transferred to another profession?
- What is a suitable way of securing the workers who are not likely to join labour market?

Looking for answers to these questions is, in a great extent, led by a fear of the ongoing digitalization. Digitalization in the Czech Republic is generally medialized as a threat for almost all workforce, and the results of scientific research tend to be forgotten, which was carried out in countries that are much further in the area of digitalization and robotization compared to the Czech Republic. The first part of this chapter will therefore summarize the basic results of foreign research, which relate to the problematice of the fourth industrial revolution (in respect of being exposed to a higher level of automatization or globalization).

In the second part, we will introduce the results of prognosis concerning the impacts of the fourth industrial revolution on Czech labour market. The very last part will discuss a role of minimum wage in highly digitalized and automatized economy.

5.1 Impacts of digitalization on labour market

Thoughts on the impacts of digitalization on labour market in the Czech Republic is, to a great extent, influenced by a fear from pushing the employees with low qualification away from labour market and a decrease in a level of remuneration. But we often tend to forget the fact that the relationship between automatization and remuneration is mutual.

\(^{10}\) For example growing dependence on internet and/or social networks (see Chou and col., 2005, Dijck, 2013, Fox and Moreland, 2015, Rosen and col., 2013, and others).
Higher level of automatization makes it possible for the companies to reach a higher level of productivity of work, which is reflected in a higher level of remuneration. On the other hand, however, increasing wage expenses (often supported by fast pace of minimum wage growth) forces economic subjects to replace work by capital (that is to increasing automatization of production). Relationship of work and capital is pointed out by Stigler (1946), according to whom, companies strive to cope with unsuitable productivity of work via new production technologies. In case of a change in the content of production factors, two situations may occur:

- **Technologies and production processes which were not profitable so far became profitable after minimum wage had been introduced**, which is due to **higher price for work**. In this case, company expenses grow but in lower pace, compared to the situation when it could not choose another production process. Employment in the company will decrease in that case – it is possible to reach a new level of production using lower volume of workforce. Introducing new technologies is usually connected with higher demands on workforce, especially on the less qualified workers, who are under a greater threat of being dismissed.

- The second explanation is offered in a theory of supply and demand shocks (represented e.g. by K. Wicksell, F. E. Kydland, M. Friedman and others). According to the shock theories, **businessman are taken out of letargy** by introducing minimum wage and they are forced to action, for example to introducing new technologies. According to Stigler (1946), those theories cannot be applied in the sectors with low incomes, which has two reasons. Firstly, the pressure to be economic in respect of wages is very strong even without minimum wage, which Stigler (1946) documents by high costs of work expressed by a proportion of wages to a sum total of costs and profits. The second reason is the fact that the sectors with the lowest wages compete with one another for workforce, and they are not heterogenous like the sectors with high wages.

To assess the impacts and look for suitable arrangements in respect of easing the negative impacts of the fourth industrial revolution, the key think is to consider the results of research in countries which are close to the Czech Republic. In 2017, Dauth and col. Published a key study dealing with the impacts of digitalization and robotization on German labour market. According to Dauth and col. (2017), **structure of workforce changed significantly in Germany due to robotization**. Due to introduction of one robot, about two job positions were cancelled in Germany, nevertheless, unemployment did not grow but workforce shifted to the service sector. Situation in Germany should be an inspiration for the Czech Republic because there is a high concentration of robots in Germany (almost 8 robots on 1 000 workers) and this proportion still grows. The Czech Republic falls behind Germany significantly (see Image 36) but it is likely to **follow German profile** (maybe slower and probably not as much¹¹). Currently, the Czech Republic belongs to countries where concentration of industrial robot sis very high, in global sense, too (see Image 36).

¹¹ Germany is not only an active user of robots but their key producer, too.
Image 36: Number of installed industrial robots on 10 thousand workers in industry in 2016 in selected countries

Source: IFR (International Federation of Robotics), processed by TREXIMA. From the left: South Korea, Singapore, Germany, Japan, Sweden, Denmark, USA, Italy, Spain, Canada, Austria, Slovakia, France, CZ, GB, China, Hungary, Ireland, Greece, Romania

In the fourth industrial revolution, Dauth and col. (2017) point out that ongoing robotization transforms German society, although there are no negative excesses on labour market. According to Acemoglu and Restrep (2016, 2017), impacts of digitalization are dramatized (e.g. Frey and Osborne, 2017) and they are more an impact of limiting theoretical assumptions. Robots substitute work of people but at the same time, they make it possible to decrease production costs (and therefore increase general level of productivity and employment). But a key role, in this case, is played by the willingness of workers to continuously add their qualifications and to change jobs, if required (even across sectors).

German research on labour market is on a high level in respect of assessment of complexity of globalization impacts. It becomes apparent that the fears of disappearing of some sectors (and also job vacancies) as a result of cheap import from the third world countries are based on incomplete or limiting theoretical assumptions, while it works differently in practise. Dauth and col. (2014) clearly show that progressive export sectors (e.g. automobile industry)
are able to absorb employees from the sectors exposed to a greater pressure due to cheap import from China and central and eastern Europe (e.g. textile industry). At the same time, there is an acceleration of growth of the differences in remuneration in the individual sectors due to globalization, which also concerns individual employees. At the same time, however, there is selective movement among sectors in Germany – less qualified and effective employees are forced out from the sectors, whereas the most effective remain in spite of the greater pressure of cheap import. For the workers with low qualifications, this import effect was three times stronger than for workers with high qualifications. These results are also confirmed by Autor and col. (2014) in case of the USA, where they identified a gap between the incomes of employees in industrial sectors exposed to import and those whose employers did not have to face that pressure.

All results therefore show that supporting incompetitive industries based on argumentation in respect of threats for labour market (and related unemployment growth) may be based on false assumptions and labour market is able to absorb these changes in medium time horizont.

5.2 Prediction of impacts in the Czech Republic

In the Czech Republic, no research has been carried out in the area of impacts of the fourth industrial revolution on labour market so far, which would be extensive or complex enough to compete with the German one (see previous chapter). But some pilot works have been carried out, and their aim is to at least predict possible impacts of digitalization and robotization on Czech workers and/or identify the groups of workers who will be effected the most in the first phase of the fourth industrial revolution.

According to the results of a study carried out by Chmelař and col. (2015), the Czech Rep. belongs to countries that will be effected the most by digitalization (see Image 37). Professions that will be effected the most by the 4th industrial revolution include the groups of lower qualified manual workers. As clear from Image 38, digitalization will most effect workers from the 4th main employment class CZ-ISCO (officers), 5th main class (workers in services and sale), 7th main class (craftsmen and repairers), 8th main class (operators of machines and equipment and assemblers) and also 9th main class (assistants and unqualified workers). The least endangered professions include highly qualified workers (2nd main class - specialists) and management workers and law makers (1st main class).

Future development of the structure of workers in the Czech Rep. is illustrated in Image 39. It’s clear from the image that structure of workers will change in connection with ongoing 4th industrial revolution, too. Except for a change in a proportion of main employment class, there will also be changes in the content of work, which cannot be controlled through developing importance of the group expressed by the proportion on total workforce.
Image 37: European Union according to the index of endangerment by digitalization


Image 38: Proportion of employment classification groups in CZ according to the index of endangerment by digitalization

Image 39: Development of a number of workers according to main employment classes CZ-ISCO until 2030

Note.: Main employment classes CZ-ISCO have the following numeral codes: 2 specialists, 3 technical and professional workers, 4 officers, 5 workers in services and sale, 6 qualified workers in agriculture, forestry and fishing, 7 craftsmen and repairers, 8 machine and equipment operators, assemblers, 9 assisting and unqualified workers.


5.3 Role of minimum wage

Institute of inimum wage will, even in highly digitalized economy, fulfill its two primary functions – socially-protective and economic-criterial. Minimum wage should still continue to contribute to the protection of employees from poverty and „allow them to live on modest material consumption and social contacts level“12. At the same time, minimum wage should be set up to motivate employees to be active on labour market. On the side of employers, it should prevent price underbidding and it should set up at least generally even conditions on labour market.

Pressure on higher wages (partly initiated by the minimum wage growth too) will lead to faster implementation of digitalization and automatization of production. But this is not a one-way relationship – a higher level of digitalization and automatization is reflected into higher

12 According to Ministerstva práce a sociálních věcí ČR. – the Ministry of Labour and Social Affairs
wages (see chapter 5.1). In this area, the minimum wage institute cannot contribute to a satisfactory solution for its case, and other institutes and arrangements will become more important – politics of employment, collective negotiation, social security system and especially a system of education. There is a simple reason – in spite of the fact that a higher level of digitalization may result in higher unemployment or economic inactivity, a structure of workforce will change. This will mean higher demands on workforce, especially on their qualifications, resp. willingness to change qualification and transfer between sectors. Creating good quality background for requalification and continuously adding new knowledge and skills is therefore a key thing. This area is mentioned for a long time as one of the principal problems of the Czech Republic, a proportion of people who participate in further education is permanently low. Concerning the ongoing digitalization, it can therefore be expected that problems in this area will continue to grow.

Concerning the change in structure of workforce, it will be important to solve also a short-term loss of incomes for employees whose field (or branch) will lose its importance and will gradually cease to exist. Even in this case, minimum wage does not bring any optimal solution, as – as Stigler (1946) points out correctly – minimum wage can help only to an employed person. This is the reason why some alternative institutes appear in a form of universal basic income, the aim of which is to provide a net income to everyone and to prevent negative impacts of digitalization and automatization connected with potentially increasing unemployment (see chapter 6).

The Czech Republic, however, belongs to small open economies, while its proexport orientation may strengthen the phenomena connected with digitalization even more. In this respect, the minimum wage institute plays its role already and its function should be fulfilled when considering preventing wages underbidding. At the same time, changes of minimum wage should be predictable not to increase a number of insecurities on a side of employers working in global economy.
6 Universal basic income

In relation to ongoing automatization and robotization, there is a question of securing the workers who will be forced out of labour market by machines. For a few decades, a question of universal basic income has been discussed, therefore an income that is paid by state to all people with no other limitations. Many theorititans study this idea, but it is also considered by a large part of political representation in developed as well as less developed countries. This chapter will therefore be aimed at the problematics of universal basic income, from the viewpoint of the principals of its functioning and also from the viewpoint of experience from the countries that have already introduced it more or less succesfully.

6.1 Principles of functioning

Universal basic income is defined as regular universal payment to all people (Van Parijs, 1992). This payment goes to people with no limitations, that is irrespective of age, economic activity, health state, size of household or other criteria that are considered in traditional social systems. In majority of proposals, universal income is paid to all residents, therefore not only to citizens (Van Parijs, 2000). Payment of universal basic income is not limited in any way by economic (in)activity and everyone can therefore continue to participate in productive activity on labour market with no other limitations\(^\text{13}\).

Universal basic income represents a secure income, which individuals can consider in their financial plans in a long-term horizon, and it creates the imaginary pillow in case of unforeseen circumstances that influence the amount of income of households (unemployment, illness, disability or similar.). On one hand, universal income is security, but on the other hand, its relation to an acceptable level of incomes is not definite. According to Van Parijs (2000), most advanced countries can afford to pay basic income on a level of existencial or living minimum.

Ethical definition of universal basic income is examined by Van Parijs (1991), who points out that people with high incomes have much higher rent on labour market. This rent is caused by structural uneevenesses on labour market and is used by people in better quality (and therefore better paid) positions. In this respect, universal basic income can be understood as a redistribution channel, which serves as a financial compensation of structural unevenness on labour market. Universal basic income is not going to remove structural

\(^{13}\) Compared to e.g. the Jobseekers´s Allowance setting in many advanced countries.
unevenness but it will be possible to continue working on the worse paid positions, which are generally connected with low incomes (for example art or education).

Universal basic income is, without doubt, a redistribution tool. According to Van Parijs (1991), it should help, besides other things, to more equal division of incomes between both genders. But as emphasized by McKay (2007), when assessing the impacts of universal basic income on gender role, it has to be done wholly, therefore complexly. One unintended effect of universal income payment can be a return to traditional roles of both genders, when women will have bigger motivation to stay at home. Through universal basic income, all efforts to achieve the same position of both genders on labour market can be de facto undermined.

To have a full picture, let’s say that universal basic income is, on theoretical level, often compared with the principal of Friedman’s negative tax (Friedman, 1962 and 1967) where universal income has, when all parameters are set suitably, similar financial impacts. But Van Parijs (1992) compares universal income to a traditional model and shows how basic income equalizes the fractures on the net income curve (see Image 40).

*Image 40: Comparing universal basic income and a traditional model*

6.2 Experience from abroad

According to Van Parijs (2000), universal basic income is older than 150 years. The first definitions of universal basic income were inspired by a French, Charles Fourier (1772-1837), one of the main representatives of utopian socialism. In 1848, his follower, Joseph Charlier, published a work about solving social problem (Charlier, 1848), in which he argues for the benefit of the so-called territorial dividends that should belong to every inhabitant on basis of common and even ownership of state land. One year later, John Stuart Mill publishes a work about principles of political economy (Mill, 1849), in which he also proposes an income that corresponds with universal basic income. According to Mill (1849), each member of community should be given living minimum irrespective of economic activity (resp. ability to economic activity). Excess production should then be divided according to shares set up in advance among 3 components – work, capital and talent.

From the middle of 19th century, universal basic income appears in works of philosophers and economists de facto continuously, nevertheless, their proposals are hidden in various terms (such as civil income, state bonus, national dividends etc.). A need to solve social problems through a similar concept became stronger in the 2nd half of the 20th century, when there are also some new attempts (and in some cases also successful solutions) in the area of introducing universal income. In this time period, the attempts to introduce universal basic income were inspired especially by an effort to achieve fairer division of incomes in society (especially in nonconnection with using non-renewable natural resources). In the past decades, the idea of universal basic income comes back more intensely, and the main topic is a role of universal basic income in the highly automatic and robotized economies. Gradual change of the political discourse is also confirmed by foundation of the network Basic Income European Network (founded in 1986), the aim of which is, besides other things, to collect the results of scientific research in the area of universal income.

In global context, there were various experiments with universal basic income, and many of them took were (or are) carried out in less developed countries (India, Namibia, Uganda). To be able to assess a possible impact of universal basic income on Czech economy objectively (and the whole society), it is necessary to assess the functioning of this concept primarily in the western world. This is the reason why next part will describe experience with universal basic income in Finland and the USA (specifically Alaska).

Finland

In Finland, the government provided for a project that started on 1.1. 2017; it is a 2-year experiment, the aim of which is to collect analytical data about functioning and impacts of universal basic income. There were 2 thousand people selected for the experiment, who were aged between 25 and 58 and were unemployed. Each of those people would be
paid 560 EUR until the end of 2018\textsuperscript{14}, and this payment was not going to be influenced by any other conditions, their income or property was not going to be tested.

Preparations of this experimental study involved \textit{research workers} from public institutions (Kela) and scientific research establishments (e.g. the University of Helsinki, University of Tampere, University of Eastern Finland or VATT Institute for Economic Research). In 2019-2020, the participating institutions will valuate results, and they will focus especially on the research issues concerning financial offers and their influence of economic activity, development of working careers of project participants (their transition between unemployment and employment) and living conditions (incl. the concept of well-being). The aim of the project is also to assess the \textbf{system issues} – e.g. whether similar concept can make social system easier and remove communication barriers between authorities and individuals.

\textbf{Alaska (USA)}

In 1976, a proposal to amend Alaskan constitution (ch. IX, art. 15) was granted, which lied in a foundation of \textit{the Permanent Fund} (hereinafter „Fund“). The aim of this Fund is to administer finances that Alaskan government regularly connects from petrol mining in Alaska. Alaska decided for this step after the largest north-American petrol resource was discovered in Prudhoe Bay. The purpose of this Fund is to administer enormous finances, straigthen distribution of incomes from natural resources mining among residents and non-residents\textsuperscript{15} and \textbf{maintain the large part of the riches} from non-renewable resources mining \textbf{for future generations}. From 1982, all people have been paid regular dividends from the Fund, which, by its character, corresponds with universal basic income. Establishment of the Fund, just like the payment of dividends represents a huge political topic on Alaska, too, nevertheless, the Fund and the dividends etabled over more than 30 years, and a proposal to cancel dividends would be something like a political suicide.

An amount of dividends that should be paid in a given year is calculated according to a set formula beforehand. Proposed dividends are then a subject of political discussion, and is decreased under a political pressure (as it was for example in 2016 and 2017). The amount of dividends paid from the Fund in the individual years is illustrated in Picture 41. In 1982-2017, there were 21,9 bill. USD in total paid to the residents from the Fund, while each resident who lived in Alaska in 1982-2017 obtained \textbf{41,2 thousand USD} in total from the Fund.

\textsuperscript{14} There is false information in media that the project finished due to political pressure. This mistake is disproved by the governing institution Kela (the Social Insurance Institution of Finland).

\textsuperscript{15} Most incomes from petrol mining went to non-residents (big supranational mining companies), therefore the aim was to return a part of incomes connected to exploatation nonrenewable resources back to Alaskan residents.
Entitlement to payment from dividends from the Fund has each resident regardless his age (including children), who resided in Alaska for at least 1 year and declares his intention to remain in Alaska in the next years, too\(^{16}\). The vagueness of the definition is a subject of discussions in this case, too, nevertheless, long-term experience with payment of the dividends under these conditions do not indicate that dividends would motivate the residents of other countries to migrate to Alaska (Goldsmith, 2002).

Payment of the dividend is done once a year. The aim of government is to provide families a one-off high payment to **to support a purchase of subjects of long-term consumption** (that is items a price of which is higher and most families have to solve their purchase by money from savings). This is also a reason why one of the original proposals based on payment of regular monthly payments was dismissed (Goldsmith, 2010). Dividends are an important part of households’ incomes, as it makes 6 % of total personal incomes of Alaskan people in total.

\(^{16}\) For entitlement of payment of dividends, other factors are also assessed, like criminal history of applicant.
When paying dividends, also social situation of their receivers is taken into account, while the aim is to compensate the individuals for temporary loss of their entitlement to benefits from social system. A special programme has been created for this purpose. Dividends are liable to federal tax\(^\text{17}\), nevertheless, the tax system favours people with low income and/or families with children significantly.

**Studies** varied out in respect of the impacts of dividends on economic activity of Alaskan people also also do not indicate that there would be a significantly negative relationship between payment of dividends and economic activity. Knapp and col. (1984) show that only 1\% of respondends worked less just because of dividends. According to Goldsmith (2010), it is not the low-income residents where dividends make a high proportion of incomes. These people would like to work more but can’t find a suitable job.

### 6.3 Advantages and disadvantages

The discussion about introducing universal basic income needs to consider the advantages as well as disadvantages connected with this concept. Based on the results of international research, opportunities and threats have been identified that each country that thinks about introducing universal basic income in practise may come across (see Table 3).

Compared to traditional systems of social security, payment of universal basic income is easier and administratively less demanding. On the other hand, it may attract attention of residents from countries which do not provide this income. On national level, a key think is that the whole society agrees on introducing similar concept, as in the opposite case, polarization of society may go even deeper. The consensus concerning the universal basic income should be based on factual information. In this respect, the Finland way can be recommended, that is using the scientific research workplaces to carry out experimental studies on a smaller population sample. Conditions and processes of experimental research should be defined in cooperation with the scientific research body and should provide relevant information for informed decision making of all participating subjects.

For individuals, universal basic income brings greater financial security as well as more space for self-fulfillment on labour market. For individuals, there is also a risk of losing motivation to work, which can be apparent in disadvantaged groups of people or for people with generally passive approach to life.

\(^{17}\) From 1970s, federal tax is maintained on low level, as state budget incomes related to petrol mining made it possible to decrease federal tax rate. In the state of Alaska, there is no income tax of natural persons.
Table 3: Advantages and disadvantages of universal basic income

<table>
<thead>
<tr>
<th>Advantages/Opportunities</th>
<th>Disadvantages/Threats</th>
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<tbody>
<tr>
<td><strong>Objective (system)</strong></td>
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<tr>
<td>System simplicity</td>
<td>Deeper polarization in society in case the intention will not be accepted by society as legitimate (e.g. in referendum)</td>
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<tr>
<td>Clarity of system</td>
<td>Attractivity for people from countries with lower living standard</td>
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<tr>
<td>Lower financial demands</td>
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<td>Lower administrative demands</td>
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<tr>
<td>Lower demands on staff</td>
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<tr>
<td>Increasing economic activity of people whose income moves on a line of entitlement of benefits (e.g. Jobseeker’s Allowance)</td>
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<tr>
<td>Easy redistribution of incomes between different groups of people (high incomes vs. low incomes, men vs. women etc.)</td>
<td></td>
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<tr>
<td><strong>Subjective (individual level)</strong></td>
<td></td>
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<tr>
<td>Work activity is not limited according to limits determined to be entitled to a benefit (for example in case of Jobseeker’s Allowance)</td>
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<tr>
<td>Financial security to commence one’s own business activities</td>
<td>Demotivation to work for less proactive individuals</td>
</tr>
<tr>
<td>finanční rezerve in times when looking for employment</td>
<td></td>
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<tr>
<td>Financial support in times when it isn’t possible to work (illness, injury, caring for a member of family) in case of the existence of carential time period</td>
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<tr>
<td>Lower administrative demands compared to various applications for individual social systém benefits</td>
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<tr>
<td>Possibility of lower economic activity of people who do badly paid and physically highly demanding work</td>
<td></td>
</tr>
<tr>
<td>Possibility of lower economic activity of people who do precarious work</td>
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</table>

Source: TREXIMA.
Conclusion

The Czech Republic belongs to the countries where the fourth industrial revolution came faster. A level of robotization of industrial production is lower here compared to the leaders in the area of digitalization and robotization, but even though, a number of robots used in production is above average in the Czech Republic on global level. The imaginary industrial revolution therefore goes on intensively in the Czech Republic, and so far it seems that its effects on labour market are not as catastrophic as many studies expected. But the fourth industrial revolution is still medialized as an imaginary scarecrow, while confusing diction is used, like „employees at risk“. On the other hand, it is important to notice the problems that arise on surface in spite of a relatively smooth course of digitalization and automatization of economy, which Czech society did not have to deal with so intensively before. There is a greater pressure put on workforce on labour market, and people will be forced to extend their qualification or change it altogether. Higher demands put on workforce will be, however, reflected in remuneration for work, where a key role is going to be played by one of the key institutes of labour market, minimum wage.

The minimum wage institute will, even in a highly digitalized economy, fulfill its two primary functions – socially-protective and economic-criterial. Minimum wage should therefore continue to contribute to protection of employees against poverty, and it should also motivate them to be active on labour market. At the same time, minimum wage should function as one of the supporting tools in a fight against selected forms of precarisation of work. Even in digitalized economy, setting up a minimum wage level will be a question of the whole-society discourse. Relationship of minimum wage and average wage will be still, logically, a result of political agreement, which should take into account the needs of employees as well as employers.

A pressure of higher wages (partially initiated by growing minimum wage) will not lead to faster digitalization and automatization of production, though. However, this is not a one-way relationship – higher level of digitalization and automatization, on the other hand, will be reflected in higher wages. In this area, however, the minimum wage institute cannot contribute to a satisfactory solution only for its base alone, other institutes and arrangements will become important – employment politics, collective negotiation, social systém arrangement and particularly a system of education. There is a simple reason – although a higher level of digitalization may not lead to increased unemployment or economic inactivity, there will be changes in the structure of workforce. That will mean increased demands on workforce, especially considering qualifications, resp. willingness to change qualification and transfer across sectors. Building good background for requalifications and continual addition of new skills and knowledge is a key thing.

Concerning the change of structure of workforce, we will have to solve short-term losses of employees incomes, too, whose field (or branch) will lose its importance and will cease to
exist. In this case, minimum wage does not bring an optimal solution, as minimum wage may help only to an employed person. In relation to ongoing automatization and robotization, there is an issue of securing the employees, who will be forced out of labour market by the machines. For several decades now, people have been discussing universal income, therefore income which is paid by the state to all people without any further limitations. This idea is examined by many theoreticians, but is also accepted by a large part of political representation in developer as well as less developer countries. Foreign experience shows that universal income may have a positive impact on employees motivation, it may increase creativity and feeling of fulfillment on labour market. At the same time, it strengthens financial security of a man at time of unexpected events, such as illness or losing job. At the same time, it confirms that universal income is not so attractive for people from other countries to lead to massive immigration to a country that provides it.

The Czech Republic belongs to small open economies, and its proexport aim may even strengthens the processes connected with digitalization. In this respect, the minimum wage institute plays its role and we should pay attention to its function in respect of preventing wage underbidding. At the same time, changes of minimum wage should be predictable not to increase a number of insecurities on a side of employers functioning in global economy. An emphasis should be put on politics based on evidence – that means all decisions should be based on relevant and trustworthy information, ideally supported by independent scientific research.
Literature


## Table I: Sections CZ-NACE

<table>
<thead>
<tr>
<th>Sector group</th>
<th>Section CZ-NACE</th>
<th>Name</th>
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<tbody>
<tr>
<td><strong>Agriculture</strong></td>
<td>A</td>
<td>Agriculture, forestry, fishing</td>
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<tr>
<td><strong>Industry and</strong></td>
<td>B</td>
<td>Mining and excavation</td>
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<td><strong>construction</strong></td>
<td>C</td>
<td>Processing industry</td>
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<td><strong>D</strong></td>
<td></td>
<td>Production and distribution of electricity, gas, heat</td>
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<td></td>
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<td>and air-conditioned air</td>
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<td><strong>E</strong></td>
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<td>Water distribution; work with waste water, waste and</td>
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<td><strong>F</strong></td>
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<td>Construction</td>
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<td>Wholesale and retail; repairs and maintenance of</td>
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<td>motor vehicles</td>
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<td><strong>H</strong></td>
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<td>Transportation and storage</td>
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<td>Accommodation, catering and hospitality</td>
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<td>Information and communication technology</td>
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<td><strong>K</strong></td>
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<td>Banking and insurance</td>
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<td><strong>L</strong></td>
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<td>Real estate work</td>
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<td><strong>M</strong></td>
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<td>Professional, scientific and technical work</td>
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<td>Administrative and assisting work</td>
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<td><strong>O</strong></td>
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<td>Public administration and defence; mandatory social</td>
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<td>security</td>
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<td><strong>P</strong></td>
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<td>Education</td>
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<td>Medical and social care</td>
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<td>Culture, entertainment and recreation</td>
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<td>Other work</td>
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<td><strong>T</strong></td>
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<td>Activities of households as employers; activities of</td>
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<td></td>
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<td>households that produce unspecified products and</td>
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<td></td>
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<td>services for own consumption</td>
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<td><strong>U</strong></td>
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<td>Work of extraterritorial organizations and authorities</td>
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