

# CONTRIBUTIONS BURDEN ON PERSONS ACTIVE IN AGRICULTURE IN RELATION TO PENSION ASPECTS

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## Abstract

The paper focuses on the area of the burden of contributions to state budget with an emphasis on pension insurance contributions of employees and self-employed persons active in the agricultural sector with regard to the amount of their future retirement pension. The comparison shows that self-employed workers in agriculture contribute to state budget about 2.5 times less than employees with comparable net income. As a result, the level of pensions is insufficient, predominantly for entrepreneurs whose pensions only amount to 39 to 45% of their real net income. On the basis of analysis of results from different models, calculations were made of the necessary monthly contributions to the supplementary pension savings plans that would ensure retirement living standards equivalent to 70% of net income earned during working life. The paper also quantifies redistributive effects by studying pension contributions of persons active in agriculture during their working life and pension withdrawals in retirement. The results are compared with those obtained from a group of employees. Contributions of the self-employed are also compared within the V4 countries. In the conclusion of the paper there are some recommendations that might lead to a reduction in the gap in contributions and better living standards for future old-age pensioners.

Keywords: employee, self-employed person, agriculture, burden of contributions, retirement pension, supplementary pension savings

## INTRODUCTION

Pension contributions with regard to the amount of future retirement pensions are a very topical and sensitive issue. Pensions are an issue that is related to the shape of the population curve and the level of pension contributions and consequently the level of retirement pensions. The paper focuses on the agricultural sector because the number of agricultural entrepreneurs (natural persons) as of 30 June 2022 was 50,954 (eAgri, 2022b). In this sector in 2021, there were 78,700 employees registered (eAgri, 2022a). As will be shown later in the paper, it should be noted that the average wage in the agricultural sector is significantly below the average wage in the economy. In 2021, the average wage in agriculture reached 79% of the national average wage in the Czech Republic. Consequently, when

persons working in agriculture retire, their standard of living significantly declines. This decline is more pronounced for entrepreneurs than for employees with the same standard of living at working age because of their low pension contributions. This will be the main focus of the paper.

Pension insurance is part of social insurance, and its main purpose is to provide income security in retirement to those who contribute to this scheme. For the calculation of the retirement pension, it is important to know the number of qualifying years (insurance period), the basis of assessment and the coefficient of increase in the general basis of assessment, as noted by Koldinská *et al.* (2018). The pension itself consists of two parts: a basic pension, identical for all pensioners, which represents an element of solidarity in the pension system, and a percentage pension, which is determined

on the basis of an individual percentage rate of the calculation basis according to the length of insurance and the income of the individual. Taxpayers are entitled to an old-age pension if they meet certain conditions. It is necessary to reach a pension age and also to have the required period of insurance, which, as stated by Hubička (2021), has gradually been increasing, e.g., for retirement before the year 2010 it was 25 years and for retirement after the year 2018 until now (2022) it is 35 years. Currently, there is a discussion about reducing the insurance period.

Social insurance contributions are typical of the Czech Republic as well as of other countries. The system in the Czech Republic has undergone considerable changes, such as the determination of the retirement age and the abolition of the second pillar of pension insurance. According to the Ministry of Finance, in 2021 social security contributions accounted for 40.6% of total state revenues of the Czech Republic. The pension insurance component is the main source of financing of Pillar 1 of the Czech pension system. Pension insurance is based on the principle of solidarity, the pay-as-you-go financing method and uniform regulation for all groups of insured persons according to Kahoun (2013). It is the principle of pay-as-you-go (PAYG) financing that is currently being discussed with regard to the long-term sustainability of the system in the face of increasing life expectancy and declining birth rates. It should be noted that unless changes to the pension system are made, it will become unsustainable in the future, mainly with regard to securing funds for mandatory expenses.

It is therefore necessary to compare contributions and expenses with regard to the payment of retirement pensions and find inspiration in pension systems of other developed countries. At the same time people should have some idea of their future pension so that they could realise that the future pension paid by the state may not be enough to cover their living needs. In this context, voluntary savings as supplementary resources to the state pension, e.g., savings with a state contribution (third pillar of the pension system) are recommended. However, this is a voluntary activity of each of us. This issue has to be dealt with immediately because as the survey of the Czech Statistical Office indicated, in 2050 up to a half of the population of the Czech Republic may be of retirement age (Štyglarová, 2014).

In connection with social insurance contributions, it is currently possible to identify significant differences in the determination of the basis of assessment for contributions. For employees and employers, the basis of assessment is defined as the total taxable income, as stated by Ženíšková (2020). For self-employed individuals, the basis of assessment is set at 50% of the partial tax base from self-employment, which is determined as

the difference between the amount of the income earned and the expenses incurred to reach, secure and maintain it. The amount of the partial tax base for self-employment is dependent on the expenses claimed. The taxpayer can record expenses at their provable costs or claim expenses as a percentage of the income earned. The amount of expenses claimed as a percentage of income is between 30% and 80% depending on the type of business. If expenses are determined in this way, the maximum absolute limit must be respected. Křemen (2014) states that the absolute limit leads to a partial mitigation of the differences in tax liabilities between self-employed persons and employees. Claiming percentage expenses brings mostly a number of benefits to individuals. The main reason for introducing it, viewed now as a benefit, is the reduction of administrative complexity, as reported by Vančurová (2020). Vychopeň (2022) adds that the percentage expense rates for earned income are set at high levels in the Czech Republic. Thus, a self-employed person can significantly optimize their liabilities (when their actual expenses are lower than flat-rate expenses). According to Kolembus (2020), the method of claiming expenses is one of the key options when optimising the contributions obligations of the self-employed person. The differences in the contributions between employees and self-employed individuals are significant because of the optimisation of expenses and the differences in the basis of assessment for social insurance contributions, as also mentioned by Červinka (2022). The lower contributions of the self-employed may pose a problem concerning the amount of pension that will be paid in the future, mostly to these individuals.

The aim of the paper is to identify and critically assess on the basis of analysis the current state of social security and pension contributions by the taxpayers and to determine the relationship between the amount of the old-age pension and the pension contributions paid by different groups of taxpayers (employees, self-employed individuals). The taxpayers are people engaged in agricultural production. The main focus will be on the evaluation of the contributions paid by self-employed workers to state budget during their working life and subsequent withdrawal (pensions paid) in retirement and the results will be compared with the results from a group of employees. Then the amount of pension paid in the future to both groups of taxpayers will be examined. The impact on state budget will also be examined and some recommendations that might reduce the identified differences will be formulated. In this context, a comparison will be made of contributions obligations within the Visegrad Group countries. The V4 countries were chosen because they have similar historical development (open economies). These countries and Germany

were used to study descriptive indicators such as total social insurance contributions in relation to total tax revenues, and the share of public revenues in the pensioner's income. Germany was chosen as a representative of advanced economy and an important export partner of the V4 countries. An important part of the paper is to develop optimum case models for the group under study with regard to the amount of pension paid in the future and the length of savings. This will be done by exploring supplementary pension savings as a specific financial product that can be used to prepare individually for retirement. Another goal of the paper is to offer possible recommendations and suggestions with regard to the principles of solidarity and merit of the pension system in the Czech Republic that would lead to the sustainability of the pension system in the future, and to make recommendations for individuals that would encourage supplementary pension savings for a dignified and secure old age.

## MATERIALS AND METHODS

Problem solving is based on the set objectives. The prerequisite for the preparation of the paper is the collection of information on the issue. Using synthesis and analysis the current state of the issue was evaluated with an emphasis on social security system and related legislation. This information was the starting point for the preparation of model examples and the subsequent comparative analysis of selected groups of taxpayers, i.e., employees and self-employed persons active in agriculture. The model examples focus on the calculation of the contributions of the groups of taxpayers to state budget and the calculation of their future pensions. The redistributive effects are also studied. The pension contributions paid by the self-employed persons engaged in agriculture during their working life and subsequently withdrawn as pensions in retirement are reported and compared with the situation of the group of employees.

In order to determine the model for self-employed workers, a questionnaire survey was conducted. The questionnaire was sent to 126 sole traders, members of the Association of Private Agriculture of the Czech Republic, and private farmers. The return rate was 31 questionnaires, i.e., about 30%. The respondents are self-employed persons running their own business as their main activity and are involved in agricultural production. This model is rather specific because for self-employed farmers the value of real income is the calculated net income plus the savings that arise

from claiming flat-rate expenses as a percentage of income (for agricultural activity 80% of the value of income earned). The questionnaire survey showed that these self-employed persons estimate that their real expenses are lower than 80% (on average about 65%). This value was also verified by data from the FADN CZ database (2020)<sup>1</sup>, where the same data output was obtained for the categories of the economically smallest farms for the year 2020, i.e., the expense rate was 70%. As the return rate of the questionnaire was low, a value of 70% was used for further calculations. Therefore, this fact was taken into account in the calculation of the net income of the self-employed and the savings obtained were added to the value of the net income. The savings are calculated as the difference between the percentage and the actual expenses according to the FADN CZ (2020), therefore (80%–70%), within the model 10%. The survey is also used to verify the awareness of the self-employed workers of their obligation to pay contributions and the amount of their future pension.

The model examples will be based on the data and rules applicable for the year 2022. They will be prepared for taxpayers receiving the minimum wage, the average wage in economy and the average wage in the agriculture sector. The total and the sectoral average wage was at the level of the first quarter of 2022, based on the data from the Czech Statistical Office (2022). On the basis of these data, the minimum wage is 16,200 CZK, the average wage in the economy is 37,929 CZK, and the average wage in agriculture is 27,983 CZK. The models are constructed in three variants: for the minimum wage (Model A), the average wage in the Czech Republic (Model B) and the average wage in agriculture (Model C). On the basis of these facts, calculations were made for an employee and a self-employed person, whose expenses are set as a percentage of earned income (80%). The model of calculation for the self-employed was set so that the net income of the employee corresponds to the real net income of the self-employed. The reason for this was the fact that the employee and the self-employed have approximately the same net income and therefore a similar standard of living. As for tax liabilities, the model taxpayer claims only the personal tax allowance which is 30,840 CZK for the year 2022. The claim for child tax credits is not considered.

Subsequently, a pension was calculated for the taxpayers. The models show the calculations for both employees and self-employed workers with a projected retirement in 2022 and a period of insurance of 35 and 45 years. The insurance period

1 FADN CZ – Agricultural Accounting Data Network, a relevant source of harmonised and comparable data on the management and economic results of agricultural enterprises processed using a uniform methodology across all EU Member States.

of 35 years was chosen as the minimum period of insurance determined by law in 2018. The period of 45 years covers the time from high school graduation to retirement age. For the determination of the future old age pension a simplified calculation was used. It does not include an increase coefficient and is based on the current value of wages. This is because the differences in the calculated pensions are negligible.

In order to make some recommendations on how to provide for old age, income earned during working life will be compared with the amount of the future retirement pension. According to Tománková (2020), retirement income should be at least 70% of pre-retirement income. The calculations will be based on this assumption. Then for the groups of self-employed persons and employees, the necessary amounts will be calculated for each option. The savings could be made under the third pillar of the current pension system, i.e., as supplementary pension savings with a state contribution. The calculation will be based on the formula, which is given, for example, by Šoba and Širůček (2017) for calculating the future value of the annuity:

$$S = a \times m \times \left( 1 + \frac{m+1}{2 \times m} \times r \right) \times \left( \frac{(1+r)^n - 1}{r} \right) \quad (1)$$

*a* .....monthly deposit (at the end of the month),  
*m* .....number of deposits during an interest period,  
*n* .....savings period (in years),  
*r* .....rate of appreciation,  
*S* .....future value.

The formula helps us express the value of the monthly deposit (*a*) which the taxpayer should regularly set aside in order to save up the required amount of money (*S*) after a given savings period (*n*) and a given appreciation (*r*). The future value of the required amount of money (*S*) is calculated in Tab. VI. For the calculation of the appreciation of the funds under the third pillar, an interest rate of 1.3% (*r*) was used. This appreciation is based on the data from the Association of Pension Societies (2021), which reports that the average appreciation of balanced funds from 2015 to 2021 was 3.25%. After subtracting the average inflation of 1.97% over the same period, the paper considers real appreciation of funds of 1.3% (after rounding). Monthly savings are considered in the context of a balanced strategy which the average Czech citizen would prefer to a dynamic strategy. The calculation will be done for a savings period of 20 and 40 years (*n*). The period of 20 years means the start of savings at the age of 45, i.e., in middle age when the person starts to think more about the approaching retirement. The period of 40 years was chosen to compare the amount of monthly savings over the savings period. The second option corresponds to the start of saving at the age of 25, which means from the

start of the taxpayer's economic activity after finishing university education. Although some employees receive pension contributions from their employers as part of employee benefits, this has been ignored so that the savings of employees and self-employed workers could be compared. The only bonus quantified in the monthly savings is the state contribution.

Subsequently, the impact on state budget is explored and recommendations are given on how to improve the situation in relation to the social security system for self-employed persons running their business as their main activity. The issue of contributions of self-employed persons is also examined within the V4 countries.

### Theoretical Background

Employment income in the Czech Republic is taxed in accordance with § 6 of Act No. 586/1992 Coll. on Income Tax. The tax base under the legal regulation in 2022 is the total amount of monetary and non-monetary income from employment. Income from self-employment is defined in § 7 of the Income Tax Act. The tax base of income from self-employment (Partial Tax Base § 7) is the amount by which the taxpayer's income in the tax period exceeds the expenses incurred to reach, secure and maintain it. The amount of the partial tax base (§ 7) is influenced by the method of accounting that the taxpayer applies. They can record expenses in a provable amount or claim expenses as a percentage of the earned income (in the Czech Republic 30% to 80%, depending on the type of income). By being able to claim expenses as a percentage of income earned, entrepreneurs can save time and costs associated with professional services. According to Ptáčková Mísařová (2018), this method of claiming expenses can minimize potential errors in distinguishing deductible from non-deductible expenses. The taxpayer can significantly optimize their tax liability (if their actual expenses are lower) as well as their social and health insurance contributions. This will be discussed later in the paper. Klimešová (2018) states that currently there is a wide range of options to minimize the tax liability of a taxpayer. The method of claiming expenses is one of the key options, but it should be noted that the current level of expenses claimed as a percentage of the value of income earned in the Czech Republic is really generous.

In addition to personal income tax on employment income and income from self-employment, social security and health insurance must be paid to state budget. For employees and employers, the basis of assessment is defined as the total income subject to tax, as stated by Ženíšková (2020). For taxpayers with income from self-employment the basis of assessment is set at 50% of the partial tax base (§7) for social insurance and health insurance contributions. The social insurance rate for self-

employed persons is 29.2% (28% for pension insurance + 1.2% for state employment policy) of the basis of assessment and the health insurance rate is set at 13.5%. For both types of insurance, there is a minimum basis of assessment, which the self-employed person must use to calculate the contributions if their basis of assessment is lower. For the calculation of the health insurance contribution, the minimum monthly basis of assessment is set at 50% of the average wage, which is currently 19,455.5 CZK. For the year 2022 this is 233,466 CZK per year. For social insurance the minimum basis of assessment is set at half that amount, i.e., 25% of the average wage. For 2022, this amount is 116,736 CZK. The employee's pension insurance is 28%, out of which 6.5% is paid from the employee's gross wage and 21.5% is paid by the employer. However, the basis of assessment is the value of income earned in employment. The differences in the contributions of employees and self-employed workers are significant, as also mentioned by Červinka (2022).

As of 31 December 2021, according to the Czech Social Security Administration there were 1,078,096 self-employed persons registered, of whom 634,205 were doing business as their main activity. Data from the Czech Statistical Office (since 2010) show that all self-employed persons in the Czech Republic account on average for 9.2–10.1% of the total population of the Czech Republic. The issue of the different tax burden on employees and self-employed persons is still very topical and often discussed by both the public and politicians, due to its continuous development and changes (Gruber, 2022). Tresch (2022) points out that the activity of the self-employed is perceived as risky. The amount of tax burden on a taxpayer affects their purchasing power and willingness to work or do business. Employment and self-employment are different both in their definition and the way of calculating compulsory contributions. Although the self-employed are entitled to the same health care as employees, their contributions are significantly lower. The lower basis of assessment of social contributions raises questions as to how fair and sustainable the system is. Lower social contributions of the self-employed will, undoubtedly, lead to low pensions in the future and poverty in old age. In the Czech Republic, however, labour is burdened by high taxation and high social insurance contributions, compared to other EU member states. Krajewska and Krajewski (2021) report that in 2019 there were almost 33 million self-employed people in the EU, out of which 13.8% were employed in the agricultural sector. They also note that the share of self-employed people in each country is closely linked to the economic development of the country. Developed countries have a lower proportion of sole proprietors than developing countries. In his research focusing on the living standard of

retirement-age households in Poland, Piekut (2020) points out that it is the farmers who have almost the lowest living standards and also very low incomes. As they retire, their standard of living significantly declines.

#### ***Comparison of the Issues within the Visegrad Group (V4) Countries***

The taxation of self-employed persons is different in each of the countries and is related to the tax system set up in the particular country. Within the Visegrad Group countries, it is possible to identify differences in approach to the taxation of entrepreneurs. In the Czech Republic it is possible to deduct expenses from the earned income, either actual or as a percentage of the value of the earned income. Depending on the type of business activity, expenses can be claimed as a percentage determined by the Income Tax Act. From this point of view, agriculture is the most favoured sector because it is possible to claim expenses in the amount of 80% (the maximum is 1.6 million CZK per year) of the earned income. Subsequently, the tax levied is 15%.

In Slovakia, there is a progressive tax of 19% which increases to 25% after exceeding 176.8 times the subsistence minimum. Since 2020, it has become possible to apply the reduced rate of 15% by entrepreneurs and legal entities whose annual income does not exceed 49,790 EUR (for the year 2022). Furthermore, self-employed persons in Slovakia can claim actual expenses or expenses as a percentage at the rate of 60% for all types of business.

In Hungary, individuals pay tax at the rate of 15%, however, legal entities and self-employed persons are taxed only at 9%. Entrepreneurs can also reduce their taxable income by actual or percentage expenses at the rate of 10%.

In Poland, a progressive income tax has been introduced. Income up to 120 000 PLN is taxed at the rate of 17% and the portion exceeding this threshold at the rate of 32%. The self-employed then have a possibility of applying the flat-rate tax of 19% instead of the traditional taxation. Taxation of agricultural activities is different from taxation of other business activities. Some farmers tax their income under personal income tax rules. This concerns the so-called special agricultural activities defined by law, e.g., growing plants in greenhouses, growing mushrooms, raising poultry, earthworms or beekeeping. Other agricultural activities are not subject to income tax but agricultural tax. Agricultural tax is a property tax and its amount is not dependent on the individual income of the farmer. It is determined by the area of land and the average price of rye. However, as Szlęzak-Matusiewicz (2018) adds, agricultural tax has been created using an outdated formula, which does not reflect the current economic situation and

I: Comparison of descriptive indicators for the V4 countries and Germany

Country	Insurance as a percentage of total tax revenues	Share of public revenues in the pensioner's income
Czech Republic	46.1	75.7
Slovakia	44.6	66.7
Poland	38.4	65.8
Hungary	31.0	73.0
Germany	39.7	68.2

Source: Authors' own work based on data from OECD 2021, OECD 2022

does not correspond to the financial performance of the farmers themselves. Thus, the approach to the taxation of agricultural activity in Poland is very different from other V4 countries. For employees, the same tax rates are applied. The tax base in the Czech Republic is the value of the earned income, i.e., gross wages, as it is in Hungary and Poland. In Slovakia, the tax base is gross wages less social and health insurance paid by the employee. In all countries, social and health insurance is also paid from income.

On the basis of the description of taxation of agricultural entrepreneurs (self-employed) in the surveyed countries, it is possible to conclude that in the Czech Republic the method of taxation (when claiming expenses from income earned) is the most advantageous.

When comparing the pension systems in the Czech Republic and the V4 countries, we can state that only Poland and Slovakia have a complete three-pillar pension system. On the other hand, Poland, despite a combination of financing through a funded system and a PAYG system, does not show very favourable results. This is mainly due to its low replacement ratio (Mercer, 2021). Since the reform, the pension system in Slovakia has suppressed solidarity and helped to increase the differences between rich and poor pensioners as a result of the new method of determination of pension insurance emphasizing the principle of merit (Klepárník *et al.*, 2017). The Hungarian pension system, like the Czech system, is only composed of Pillar 1 and Pillar 3. As stated by Moldicz (2021), one of the weaknesses of the system is the method of financing the pension system, which is unsustainable due to the rise in aging population. He recommends increasing pension contributions, setting up a mechanism for increasing the retirement age, and increasing motivation for household savings as an additional source of income. Klepárník *et al.* (2017) add that inspiration can be a three-pillar system, including occupational schemes, with the inclusion of social functions into Pillar 2, e.g. as it is in Latvia.

An important component of public budgets is social insurance revenue. According to OECD (2021), it is on average 25%. The share of public revenues in the income of a pensioner is only 40% on average for all OECD countries. Vančurová (2021), however, states that there is a high variability between

countries. Tab. I below shows partial ratios (total insurance contributions to total tax revenues) for the V4 countries and also the percentage of public pensions. Germany is added for comparison as a representative of an advanced economy.

## RESULTS AND DISCUSSION

Tabs. II and III show the calculations of the contributions and net incomes of employees and self-employed workers. The model example of a self-employed person was set so that their net annual income corresponds to that of an employee. In the case of a self-employed person there are also savings, i.e., the difference between the expenses as a percentage of income and actual expenses – see Methods. The calculations are made in three options with regard to the minimum wage (Model A), the average wage in the Czech Republic (Model B) and the average wage for the agricultural sector (Model C).

If we compare the contributions of an employee and those of a self-employed person, it is quite obvious that there are significant differences. The above calculations show that with comparable net incomes of an employee and a self-employed person (a comparable standard of living of these groups of taxpayers), the employee contributes significantly more to state budget than the entrepreneur. The calculations reveal that with the same net income in Model C it is paid 2.44 times more to state budget for an employee than for a self-employed person (1.33 times more in Model A and 2.65 times more in Model B). This significant difference is caused by two factors, namely different methods for the determination of the basis of assessment for insurance contributions and the possibility of flat-rate expenses for self-employed persons. According to the questionnaire, these are set at high percentage values that often significantly exceed the value of the actual expenses of self-employed persons.

The old-age pension will be calculated with social insurance paid for a minimum period of insurance for 2022, i.e., 35 years. We will also consider a period of 45 years, which covers the time from the end of secondary education to retirement age. A comparison of pension contributions and the old-age pension will be made. The calculation will be made for Model C, i.e., taxpayers with the average agriculture salary.

II: *Employee's contributions obligations and net income – Model A, B, C*

EMPLOYEE	Model A	Model B	Model C
Gross monthly salary	16,200 CZK	37,929 CZK	27,983 CZK
Gross annual salary	194,400 CZK	455,148 CZK	335,796 CZK
Social insurance contributions – employer	48,212 CZK	112,877 CZK	83,278 CZK
Health insurance contributions – employer	17,496 CZK	40,964 CZK	30,222 CZK
Social insurance contributions – employee	12,636 CZK	29,585 CZK	21,827 CZK
Health insurance contributions – employee	8,748 CZK	20,482 CZK	15,111 CZK
Pension insurance contributions	54,432 CZK	127,441 CZK	94,023 CZK
Tax base	194,400 CZK	455,100 CZK	335,700 CZK
Tax after discounts	- CZK	37,425 CZK	19,515 CZK
Contributions burden	87,092 CZK	241,333 CZK	169,953 CZK
Contributions burden in %	44.80%	53.02%	50.61%
Annual net salary	173,016 CZK	367,656 CZK	279,343 CZK
Monthly net salary	14,418 CZK	30,638 CZK	23,279 CZK

Source: Authors' own calculations

III: *Self-employed person's contributions obligations and net income – Model A, B, C*

Self-employed person's contributions	Model A	Model B	Model C
Gross monthly salary	66,284 CZK	127,468 CZK	96,944 CZK
Gross annual salary	795,408 CZK	1,529,616 CZK	1,163,328 CZK
Actual expenses at the rate of 70%	556,786 CZK	1,070,731 CZK	814,330 CZK
Income after deduction of expenses	238,622 CZK	458,885 CZK	348,998 CZK
Flat-rate expenses at the rate of 80%	636,326 CZK	1,223,693 CZK	930,662 CZK
Basis of assessment for social insurance	116,736 CZK	152,962 CZK	116,736 CZK
Social insurance contributions	34,087 CZK	44,665 CZK	34,087 CZK
of which pension insurance contributions	32,686 CZK	42,829 CZK	32,686 CZK
Basis of assessment for health insurance	233,466 CZK	233,466 CZK	233,466 CZK
Health insurance contributions	31,518 CZK	31,518 CZK	31,518 CZK
Tax base	159,000 CZK	305,900 CZK	232,600 CZK
Tax after discounts	- CZK	15,045 CZK	4,050 CZK
Contributions burden	65,605 CZK	91,228 CZK	69,655 CZK
Contributions burden in %	27.49%	19.88%	19.96%
Net annual income with savings	173,018 CZK	367,657 CZK	279,344 CZK
Net monthly income with savings	14,418 CZK	30,638 CZK	23,279 CZK

Source: Authors' own calculations

Tab. IV shows that due to lower social security contributions of self-employed workers, their pensions are lower, compared to those of employees. The pension of employees, if the insurance period was 35 years, in relation to their net wages is about 61.74%, while the pension of self-employed workers is only 38.69% of their real net income. If the period of insurance is longer, these percentages increase very slowly, as shown in Tab. IV.

The following part compares pension contributions and pensions. For the calculations, the period of insurance is 35 years and 45 years. The length of retirement is 13.34 years. This reflects the average life expectancy in the Czech Republic based on information from the Czech Statistical Office (2021). Tab. V shows the amount of contributions paid for the respective period and the amount of pensions. There is also a ratio of these variables.

IV: *Old-age pensions of employees and self-employed persons active in agriculture (in CZK and in %)*

	Employee	Self-employed person
Gross annual salary/income	335,796 CZK	1,163,328 CZK
Net annual salary/income	279,343 CZK	279,344 CZK
Old-age pension/year (35 years)	172,454 CZK	108,086 CZK
Pension to net salary/income	61.74%	38.69%
Old-age pension/year (45 years)	208,355 CZK	125,597 CZK
Pension to net salary/income	74.59%	44.96%

Source: Authors' own calculations

V: *Ratio of pensions paid, and contributions paid by employees and self-employed persons in agriculture (in CZK and in %)*

	Employee	Self-employed
Pension insurance contributions for 35 years	3,290,801 CZK	1,144,013 CZK
Pension drawn for 13.34 years	2,299,390 CZK	1,441,152 CZK
Ratio between pension and contributions	69.87%	125.97%
Pension insurance contributions for 45 years	4,231,030 CZK	1,470,874 CZK
Pension drawn for 13.34 years	2,778,073 CZK	1,674,624 CZK
Ratio between pension and contributions	65.66%	113.85%

Source: Authors' own calculations

From Tab. V it is evident that the employee's pension contributions are sufficient, i.e., the employee is able to cover their pension. At the same time, the part that has not been drawn during the employee's retirement becomes part of the funds that are redistributed as an expression of solidarity. On the other hand, the self-employed person is not able to cover their pension from the contributions to the pension scheme. It is clear that their pension is drawn from what was not drawn by employees.

**Supplementary Pension Savings (Pillar 3)**

The calculations above reveal that there is a significant difference between net income and the future pension, predominantly for self-employed persons. For this reason, these workers should choose a supplementary pension scheme

(Pillar 3), which could close the gap. If we assume that the retirement income would be at least 70% of net income earned during working life, annual and then total contributions would be required, as shown in Tab. VI.

The differences in the drop in retirement income can be solved by joining Pillar 3, i.e., voluntary supplementary additional insurance. Total amounts needed to compensate for the pension are shown in Tab. VI. The amounts of the contributions will be based on the appreciation rate of the deposits.

The low contributions of the self-employed will affect the future old-age pension. The old-age pension paid to the self-employed under Pillar 1 is not sufficient, so it is advisable not to rely only on the state pension and to prepare for a decline in retirement income. In this case, the

VI: *Amount of funds needed to settle pensions (in CZK)*

	Employee	Self-employed
Net annual salary/income	279,343 CZK	279,344 CZK
Annual old-age pension (insurance period of 35 years) – X	172,454 CZK	108,086 CZK
Annual old-age pension (insurance period of 45 years) – Y	208,355 CZK	125,597 CZK
Pension income (70% of net income) – Z	195,540 CZK	195,541 CZK
Annual difference (X - Z) with insurance period of 35 years	-23,086 CZK	-87,454 CZK
Total amount to compensate for pension (13.34 years)	307,965 CZK	1,166,638 CZK
Annual difference (Y - Z) with insurance period of 45 years	12,815 CZK	-69,944 CZK
Total amount to compensate for pension (13.34 years)	0 CZK	933,049 CZK

Source: Authors' own calculations



individual's own income security during working life is essential. A lot of people have almost no idea of their future standard of living. According to the survey results provided by the Stem/Mark Agency, less than 20% of the respondents assume that their pension will be at least 51–60% of their pre-retirement income, 12% of the respondents believe that their future pension will be 71–80% of their income (Broker Trust, 2017). In this situation a potential solution may be individual savings for old age. One of the options of savings for retirement is just Pillar 3 of the pension system, the so-called supplementary pension savings with a state contribution. Tománková (2020) reports that in developed countries, a person prepared for old age is the one whose retirement income is at least 70% of their pre-retirement income.

The differences between the standard of living during working life and a consequent drop in income in retirement will be offset in the following calculations by participation in Pillar 3 of the pension system. The amount of the monthly contributions will depend mainly on the length of the savings period, the appreciation rate of the

deposits and the amount of money needed for retirement. For the calculations the appreciation rate of 1.3% p.a. will be used, which is also assumed by the Association of Pension Companies (2021), taking into account the average appreciation of individual funds. The appreciation rate of 1.3% corresponds to the real appreciation of balanced pension funds (see Methods).

The calculation of contributions to the supplementary pension system and necessary funds for retirement will be based on an assumption that a taxpayer has been a member of the pension scheme for 35 years and 45 years.

Tab. VIII and IX show how much money needs to be saved during working life with savings for 40 and 20 years and the insurance period of 35 years (Tab. VIII) and 45 years (Tab. IX) so that taxpayers are relatively financially secure in old age. If the insurance period were 45 years, the employee would not have to set aside any funds every month to ensure a dignified old age. In that case, the retirement income would exceed 70% of the net wage earned during working life. It should be noted that the savings calculated for the self-employed are significantly higher than the average amount which the Czech citizen saves for their old age. According to the Association of Pension Companies (2022a) the average amount of the participant's contribution to pension products is 795 CZK per month.

### **Evaluation of the Results of the Questionnaire Survey**

To construct the model examples, it was first necessary to conduct a questionnaire survey to find out the actual expenses of entrepreneurs in the agricultural sector. The questions were whether the respondents have an idea of the amount of their future pension and whether they contribute to a supplementary pension savings

VII: *Input parameters for the calculation of the monthly savings*

Monthly contribution (at the end of the month)	a	$a_1$
State contribution		$a_2$
Number of contributions per interest period	m	12
Savings period (years)	n	40 years 20 years
Appreciation rate	r	1.3%
Future value	S	see Tab. VI

Source: Authors' own calculations

VIII: *Supplementary pension savings with a period of insurance of 35 years – savings period of 40 and 20 years*

Insurance period - 35 years	Monthly contribution	State contribution	Total
Employee (40 years)	400 CZK	110 CZK	510 CZK
Self-employed (40 years)	1,627 CZK	230 CZK	1,857 CZK
Employee (20 years)	915 CZK	210 CZK	1,125 CZK
Self-employed (20 years)	4,032 CZK	230 CZK	4,262 CZK

Source: Authors' own calculations

IX: *Supplementary pension savings with a period of insurance of 45 years – savings period of 40 and 20 years*

Insurance period - 45 years	Monthly contribution	State contribution	Total
Employee (40 years)	-	-	-
Self-employed (40 years)	1,256 CZK	230 CZK	1,486 CZK
Employee (20 years)	-	-	-
Self-employed (20 years)	3,179 CZK	230 CZK	3,409 CZK

Source: Authors' own calculations

system (third pillar). The questionnaire was sent to 126 entrepreneurs, members of the Association of Private Agriculture of the Czech Republic and self-employed farmers. The respondents were self-employed persons doing their business as a main activity. The return rate was 31 questionnaires, which is about 30%, (8 women and 23 men). The number of respondents under the age of 40 was 13 and the number of those over the age of 40 was 18. Their responses revealed that 77.5% of them claim expenses as a percentage of income earned. All respondents also knew the amount of their actual expenses. Actual expenses were on average about 65% of income earned. When asked about the amount of their future pension

payments, 90% of respondents had no knowledge. Only two women and one man over the age of 40 confirmed the knowledge of their future pension payments. The participation in the supplementary pension savings system was confirmed by about 26% respondents, five women and three men, only two of these were under the age of 40. The results of the survey cannot be generalised as the return rate of the questionnaires was low. Despite this, the results can still be used for the information campaign that it is good to have the knowledge of future pensions. This campaign should be aimed not only at entrepreneurs. Now, it should be noted that such a campaign is currently underway in the Czech Republic.

## CONCLUSION

In this paper, the contributions obligations of entrepreneurs (self-employed persons) and employees were determined on the basis of specialized literature and mainly legal norms. For the model examples, incomes equal to the average wages in the agricultural sector in the first quarter of 2022 were chosen. The data were provided by the Czech Statistical Office. These values constituted the gross wage of an employee. For entrepreneurs, a specific model was used to make the values of the net real income earned by the self-employed and the net income of the employee comparable.

The results show that self-employed persons working in agriculture contribute about 2.5 times less to state budget than employees (in the employment relationship) with a comparable net income, i.e., with the same standard of living. These differences arise mainly from the differences in the basis of assessment for social and health insurance for the two groups of taxpayers and the percentage of expenses that entrepreneurs can claim, which is extremely generous. Lower social security contributions of self-employed persons may cause a problem with their pensions in the future. It is reported that the amount of pension should be around 70% of the income earned during working life if the standard of living were to be maintained. However, this was not confirmed by the research conducted. The calculations showed that the pension was 62 to 75% of the real net income for employees and only 39 to 45% for the self-employed, as given in Tab. IV. The calculations were made with regard to the average wage for the agricultural sector and also the insurance period of 35 and 45 years. The results suggest that the pensions for the self-employed are low.

When comparing the social insurance contributions paid and the pension drawn over a period set with respect to life expectancy, it was found that over the period of insurance the employee pays the full amount of the pension drawn in the future and still makes a provision. However, this is not true for the self-employed because they even do not pay high enough social security contributions to cover their future pensions, as evident from Tab. V.

Tab. VII shows that the amount of money that is needed at retirement to maintain an individual's standard of living is 70% of their current income. Subsequent calculations of the monthly contributions to the supplementary pension savings system (Tabs. VIII and IX) showed that, with a minimum insurance period of 35 years, a self-employed person must save approximately four times as much as an employee should save each month. With an insurance period of 45 years, the employee's old age pension is sufficient to cover 70% of their current salary so that they do not have to save. The findings clearly show that those who should prepare for retirement are predominantly entrepreneurs whose monthly contributions equal to the average contribution in the Czech Republic (of less than 800 CZK) will not be enough for a dignified old age.

On the basis of the above, it would be advisable to increase the basis of assessment for self-employed workers so that the difference in social security contributions between the groups becomes less marked. This proposal can also be supported by the demand of the Fair Pensions Commission, which in its proposal for a new pension system recommends increasing the calculation basis from 50% of the difference between income and expenditure to 75%. In line with this change, it also calls for an increase in the minimum basis of assessment. This concerns a majority of the self-employed. A further recommendation is to reduce the values of expenses set as a percentage of earned income, which are higher than the actual expenses. This was confirmed by the questionnaire survey and the data from the FADN CZ database. The analysis of the taxation of self-employed persons in the

V4 countries shows that the highest value is connected with the method of claiming expenses as a percentage of income earned.

In connection with the discussed topic regarding the issue of the pension system, the so-called architecture of the new pension system was created. It was published in 2020 in a press release of the Ministry of Labour and Social Affairs of the Czech Republic. This is a proposal for pension reform developed by the Fair Pensions Commission. One of the main changes in the proposal is the division of the current Pillar I into Pillar Zero and Pillar One. Pillar Zero should be a solidarity component of the pension, the same for all regardless of the individual's position, and should ensure a dignified old age for all without distinction. Pillar One represents the merit component. Although this proposal shows a fairer design of the old-age pension, which will provide basic needs of pensioners, it is criticized for high costs and the need to raise additional funds for it.

With regard to the annual savings of self-employed persons, compared to the contributions of employees, it would be advisable for entrepreneurs to save for their future pension during their working life using, for example, a supplementary pension savings fund (Pillar 3). The calculations show that the savings made by the self-employed are sufficient for supplementary savings and even considerably exceed them. With the current high inflation and high interest rates, pension savings products are losing their attractiveness and classic savings accounts are becoming more attractive. However, the Association of Pension Societies (2022b) points out that the unfavourable conditions of the current crisis are not a reason to abolish pension savings. On the contrary, it recommends setting up pension savings at the beginning of an individual's economic activity, with a dynamic or balanced strategy. Since pension savings are a long-term continuous activity, it is expected that inflation and interest rates will gradually fall and return to normal.

In conclusion, it should be pointed out that self-employed workers do not care about the amount of their pension and most of them do not save for retirement using supplementary pension savings schemes. As shown by the questionnaire survey, less than 10% of respondents know the approximate amount of their future pension and only 26% of respondents contribute to the supplementary pension savings scheme. This can be interpreted as irresponsible behaviour. In view of demographic trends, it is necessary to save for retirement and this applies mostly to the self-employed. At the same time, it is evident from the comparison of the ratio of public revenues to the pensioner income in the Visegrad Group countries and Germany that the Czech Republic has the highest ratio. The same conclusion applies to another value, i.e., the share of insurance contributions in total tax revenues, and the Czech Republic has the highest ratio. This shows that pension benefits paid from the state budget are very important in the Czech Republic and that other than public sources are very low in comparison with the other countries surveyed.

Currently, there are increasing pressures in the Czech Republic for change in the area of pensions through the pension reform that is expected to be presented by the government by the end of 2023. However, this is an issue that must be approved by all political parties. All these changes should also be properly explained to citizens so that they may accept them. The principle of solidarity and merit are values essential to the pension system, however, the paper presented shows that the current model is based largely on the principle of solidarity. The authors of the paper believe that the merit principle should be strengthened in the reform. At the same time, it is necessary to put emphasis on the income side of the pension system.

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