# The long-run evolution of inequality in the Czech Lands: Top income shares, 1898-2015

Filip Novokmet

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Filip Novokmet
*Paris School of Economics (PSE)*

## Abstract

This work analyses the evolution of the top income shares in the Czech Lands from the end of the 19th century until today. Top income shares followed a U-shaped evolution in the course of the 20th century. Higher shares in the first half of the 20th century were due to high concentration of capital income at the top of the income distribution. Equally, shocks to top capital incomes were the main force behind the secular fall in top concentration. Communism led to the virtual annihilation of private capital income and the stumbling of top income shares. A sharp decline in the first half of the twentieth century was largely due a drop in the top percentile share. After residing at very low levels featured by remarkable stability for several decades, top income shares have increased after the fall of communism. The transition to the market economy saw a rise in both top labour and top capital incomes. However, in contrast to the pre-communist period, there is a higher prominence of the working rich at the top. This evolution is explained by the continuous interplay of economic and political forces. The Czech Republic is the suggestive example of the critical role played by the interaction between private, public and foreign capital in shaping top income patterns. Except for the socialist period, when the bulk of wealth was in the public ownership, the holders of top capital incomes have disproportionally been foreigners.

## 1. Introduction

This work investigates the long-term development of income inequality in the Czech Republic. We construct top income shares from the 1890s until the present day using the income tax data. This outstanding historical reach has been the main motivation to engage in the present project of charting historical patterns of inequality in Central Eastern Europe. We aim to outline the inequality development over time and to understand forces that have been driving it. At the same time, our goal is to contribute to the general understanding of historical processes in Central Eastern Europe. The extension of the Czech series all the way back to the end of the 19th century raises a broad range of issues, which still need to be tackled in the Central Eastern European economic history.

The use of tax data has been central to understand the evolution of the income and wealth distribution. It is their availability – often extending over the whole 20th century and before – that makes them unique in comparison to other commonly used sources. The long-term perspective is critical since the evolution of income distribution is characteristically manifested in longer structural processes, such as the shift from agricultural to industrial world (Kuznets 1955), effects of progressive taxation on capital concentration or the importance of inheritance (Piketty 2011), etc. The recent application of income tax data in the top incomes research has resulted in the fascinating work (Atkinson and Piketty 2007, 2010), which has provided a broad historical perspective of income inequality in the international context. The most valuable asset of the whole effort has been its empirical contribution which is visible in data series that are "homogenous across countries, annual, long-run, and broken down by income source for most countries" (Atkinson et al. 2011, p. 4).

The availability of the income tax data for the Czech Lands all the way back to the 19th century has allowed us to shed a light on the long-term evolution of inequality in the Czech Lands and to analyse the country's experience in the international perspective. We provide first homogeneous series of top income shares in Czech Lands that allows comparability both through time and across countries. As such, we believe it to be the best available indicator of the long-term development of inequality in the Czech Lands. In addition, an insight into particular income sources of top groups has broaden our understanding of the role that various economic, institutional or political factors have played in the evolution of top incomes.

The main finding is that top income shares followed the U-shaped evolution of top incomes in the course of the 20th century. Top income shares attained the highest levels during the Habsburg period and surged during the First World War, which signified its secular peak. Subsequently, top income shares experienced a long-term falling trend. Communism was featured by the marked stability of top income shares at low levels. The transition to the market economy saw a rise in both top capital and top labour incomes.

The most important force underlying the evolution of inequality were changes to the concentration of the capital income at the top. Thus, higher shares in the first half of the 20th century were a consequence of the stronger concentration of capital income at the top of the income distribution. We relate high shares during the Habsburg era to the specific industrialization course in Central Europe, disproportionally benefiting top capital incomes. The secular decline in top incomes was equally 'capital income phenomenon', since shocks to the concentration of capital income were the main force behind an overall decline in inequality (Piketty 2001; Roine and Waldenstrom 2015). Major shocks such as the wars, the Great Depression, as well as anti-capitalist redistributive policies, had a decisive impact on the long-term reduction of inequality by striking the 'capitalist' top of the distribution. Czechoslovakia in addition provides, with the introduction of the communism, the most extreme example of the exogenous shock thoroughly modifying the income distribution. The complete elimination of private capital income resulted in a sharp drop in top income shares and the wealthy virtually ceased to exist.

On the other hand, top earnings exhibited relatively more stable pattern. A development of top earnings in the first half of the century is broadly indicated by the evolution of the top shares below the top percentile (e.g. top 5-1%). These were hurt during the WW1, but its relative standing had improved in the First Republic. Further, top earnings fared relatively well through the Great Depression due to wage rigidity during the prolonged deflation. However, they were struck by Nazi wage equalization, and the communist policy was only a continuation of this course. The socialist period was characterized by low and stable inequality of earnings, to the point that the notion of 'Czech egalitarianism' was coined. [1]

The outlined evolution clearly suggests that it is important to distinguish economic factors from the non-economic - such as political, institutional, or cultural factors - when accounting for

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[1] The phrase goes back to Connor (1979) (see Atkinson 2008, p. 174).

changes in inequality. Top incomes were shaped by the inextricable workings of economic and political forces. The interrelationship of the economic and political spheres was markedly different during pre-WWI Habsburg era, the First Republic, the Protectorate, the Socialist Republic, or the recent post-socialist era, which is accordingly reflected in the evolution of top income shares. For example, the episodes of boosts to business profits during the state economy in the late 1930s and later under the German occupation provide a clear evidence of the importance of the political variables in shaping distribution patterns.

Consequently, top income research need to inevitably stretch to other research areas and calls for an interdisciplinary approach. The sheer creation of the term 'Czech egalitarianism' reveals deficiencies of a solely economic reasoning when trying to explain the evolution of inequality. For example, after pointing to inadequacy of various economic arguments in explaining this phenomenon, Atkinson (2008, p. 49) points to Teichova's (1988, p. 101) observation that "the desire for greater equality had deep historical roots in the social consciousness of the broad segments of society". Večernik (1996, p. 212) similarly mentions the "social-democratic profile of the Czech nation" which was built from "plebeian roots". However, this almost 'Tocquevillian'[2] reasoning, relating initial social conditions to egalitarian and democratic character of the society (both thought to be true for the Czech Lands), should be put in the context. Most importantly, these narratives need to take into account the critical role that wealth concentration has played in the evolution of inequality. And it had been far from egalitarian.

The distribution of the capital ownership is the axis around which various dimensions of distributional conflict in the Czech Lands manifested, and, one should not, therefore, disregard the rich history of ethnic, class and political struggles and competitions when analysing the long-term evolution of inequality. A striking land concentration in the hands of the 'foreign' Habsburg nobility aroused strong feelings among predominantly agricultural population in Central Eastern Europe. Disproportionally larger role of the landholding nobility as the 'capitalist class' heightened further the 'social consciousness' (Gellner 1983; Hroch 1985, 2015, etc.). Equally, industrialization in Central Eastern Europe was featured by what Berend (1989) called the "missing indigenous middle class", where Germans and Jews had to fill positions created by modern economy. To a certain extent, 'Czech egalitarianism' could be also seen as the reaction to the disproportionally higher 'foreign' component of top income shares until the end of WWII.

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[2] E.g. Tocqueville 1838, ch.3; another popular argument relates it to the protestant tradition of Hussism

As we show, these dividing lines especially sharpened during the key junctures in the country's history, such as during the World Wars or the Nazi occupation.

A multidimensional character of the distributional conflict critically impacted top income shares as conflicts had largely been centred on the wealth redistribution. Therefore, it affected the concentration of capital income, and, in turn, top income shares. Accordingly, we pay special attention to the historical context of major distributional struggles, such as the 'nostrification', the land reform, the progressive capital taxation, 'Aryanization' or communist nationalization. Furthermore, the balance between private, public and foreign capital has been another dimension affecting the top income shares through concentration of the capital income. The corporate wealth has been traditionally concentrated in the Czech Lands (Teichova 1974; see Novokmet 2017, ch. 5), and larger state ownership during Communism or foreign ownership both before Communism and subsequently, have made the concentration of private capital income less pronounced at the top of the income distribution.

Finally, this research has emphasized a need to take a long-run perspective to understand changes in income distribution. In this respect, top income research has done a tremendous leap forward in response to Atkinson's (1997) call to "bringing income distribution out of cold". New top income series allow us the analysis of historical trajectories that go beyond strictly distributional concerns, providing us with valuable insights during the critical moments of country's history such as industrialization, forming of the nation, wars and occupation, the introduction of communism and its eventual fall. It raises new issues and calls for new research in the Czech and Central European economic history.

The paper is organised as follows. Section 2 describes data sources and methodology. Section 3 outlines main trends of the top income shares since the end of the 19th century until today. Sections 4 to 7 analyse top income shares in particular time periods: in Imperial Austria, during the First Republic, during Communist Czechoslovakia and after the fall of communism. Section 8 compares the estimates for the Czech Republic with other countries. Section 9 concludes. The details of the data and estimation are discussed in the appendix

## 2. Data and methodology

The methodological approach used to construct top income shares was introduced by Simon Kuznets (1953) who first combined income tax data with external controls for income and population totals to estimate top income shares for the United States. The work was revived by Thomas Piketty's (2001; 2003) work on top incomes in France, and has been intensified since, resulting in data series for more than thirty countries.

We have used the income tax statistics to construct top income series in the Czech Lands from 1898, which is the year of the introduction of the modern income tax in Imperial Austria. Since then, the tax return statistics had been published annually in a tabulation form for each province of Imperial Austria[3] until the outbreak of WWI. After the dissolution of Austria-Hungary, the newly established First Czechoslovak Republic inherited its tax system. This, however, implied that two markedly different tax systems had operated in the Czech Lands and Slovakia – as a consequence of different tax legislations between the Austrian (Cisleithania) and the Hungarian (Transleithania) part of the Monarchy. A much-needed reform toward modern unified tax system, focused on direct taxes, was accomplished in 1927. Most importantly for our purposes, it resulted in a renewed publishing of income tax statistics. The publication continued also under the German occupation. Unfortunately, we could not rely on the same source in order to assess the evolution of top incomes after the Second World War. The introduction of communism signified a major break in the data comparability. We therefore use alternative distribution sources to ascertain general trends in top inequality in communism and the subsequent transition to market economy: the household budget survey (the Czechoslovak Microcensus) and Employer Censuses of all workers. Finally, for the recent decade (2005-2015), our estimates are based on the statistics of personal income tax returns. These are used in combination with household survey data (EU-SILC) to estimate the whole income distribution. Namely, tax data on high-income individuals are used to correct the top of the income distribution in the survey, by assuming the piecewise-linear correction factors f(p) above percentiles for which the survey is held to be representative up to the percentiles in the tax data (see Piketty, et al. 2017 and Novokmet et al. 2017). See appendix for all details.

The preferred income definition refers to gross income, before all personal deductions and personal income tax, but after deductions from revenues of costs needed to obtain and secure

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[3] Here we use the term Imperial Austria for the Austrian part (the so-called Cisleithania) of Austria-Hungary.

income. In general, the coverage of income reported on the tax return for the earlier periods was quite comprehensive, allowing very few exemptions. It included wages and salaries, business and self-employment income, capital income, rental income, income from land, as well as certain non-monetary incomes such as imputed rents of homeowners. For the communist period, we use the income reported in the Microcensus and gross earnings reported in Employer Surveys. Both give almost identical results, since earnings present a reliable indicator of the total income evolution due to the complete elimination of private income in communist Czechoslovakia.

Top income groups are defined according to the definition of the tax unit in the tax code. The tax unit in the Habsburg and in the interwar period was household, defined as a married couple with dependants. Therefore, the total number of tax units is taken as all adults minus the number of married females. The corresponding data are found in population censuses with estimates for in-between years linearly interpolated and complemented from the annual reports of the Movement of population. For the communist and the recent period, the unit of analysis has been individual, and we take all adults as the population control total. The total income of all potential tax units is estimated from personal income in National Accounts. For the interwar period, we use the historical national accounts of Stadnik (1946), Pryor et al. (1971) and Krejči (1972, 1986). For the Habsburg era we use estimates of Schulze (2000, 2005, 2007), making necessary adjustments as described in the appendix. Finally, we obtain thresholds and average income of specific fractiles of interest by assuming the Pareto distribution for the upper tail of the income distribution. Top income shares are estimated by taking the income of corresponding fractile group as the proportion of estimated income. For the recent years, we apply generalized Pareto interpolation (Blanchet, Fournier and Piketty 2017)

## 3. The long-term evolution of top income shares

Figure 1 presents the evolution of the top 1 per cent and the top 5-1 per cent income share in the Czech Republic from 1897 until 2015. Through the course of the 20th century top incomes experienced a marked U-shaped pattern, with communism marking the low point. In this period, we can clearly distinguish four distinctive subperiods in the evolution of top income shares: the period in Imperial Austria, the period of the First Czechoslovak Republic in interwar years and during the German occupation and WWII, the communist era, and finally the post-communist period. Accordingly, we look separately at each below.

Top 1 per cent income share had been stable at roughly 14 per cent at the beginning of the twentieth century until the First World War, when it jumped to almost 18 per cent, which signified its secular peak. The subsequent two decades saw a continuously declining pattern. The top percentile's share first fell during the interwar period, and then stumbled with the advent of the communism, after which it plateaued at levels slightly below 3 per cent for almost three decades. It has risen since the end of communism, and in the recent years has been at levels slightly below 10 per cent of the total income – thus still lower than in the first half of the twentieth century. The 'next 4 per cent' also underwent a U-shaped evolution, but it was characterized by strong upheavals in the first half of the twentieth century, and the post-WWII fall was less stunning then in the case of the top percentile. Especially remarking is the different experience with the communist accession to power in 1946, where the top 1 per cent share literally halved, while the top 5-1 per cent share remained the same.

Therefore, and this needs to be stressed repeatedly, in order to understand the evolution of top income shares it is critical to look at the development of various top income groups, which frequently exhibit different income composition and are representative of distinct social groups. Correspondingly, we can analyse the evolution of the top 1% per cent and the top 5-1% as indicative of the evolution of top capital and top labour incomes, respectively. Moreover, it is useful to look into the development of the very top groups. Figure 2 thus presents together three constituent parts of top 1 per cent: the share of the top 0.1 per cent which marks the very top of the distribution, the share of the 0.5–0.1 per cent group right under it, and the share for the remaining 0.5 per cent (1–0.5%). It can be seen that the top 0.1 per cent experienced quite pronounced shifts, and that it was the main driving force behind the evolution of the top percentile in the first half of the twentieth century. The lower two groups, on the other hand, besides taking part in an overall secular fall with the introduction of communism, have generally displayed more stable patterns. For example, top 0.1 per cent income share was the chief force behind a surge during WW1, a marked V-pattern from 1927 until 1943, a plunge immediately after WW2, or a drop during the recent crisis,
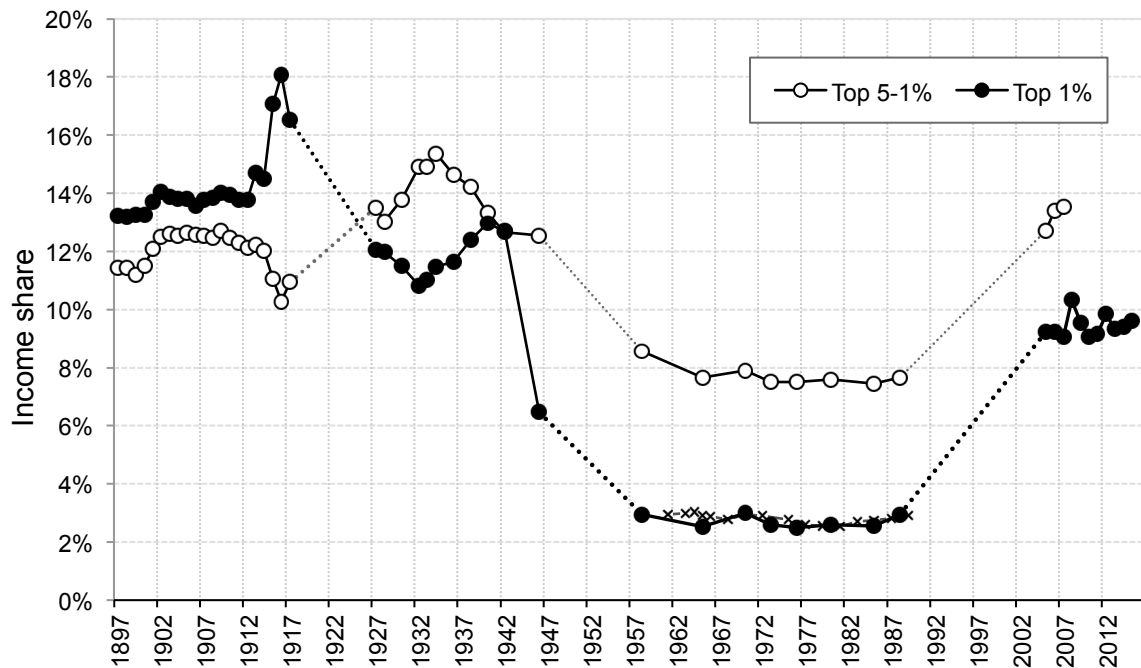
Figure 1: Top 1 per cent and top 5-1 per cent in the Czech Republic

Source: Author's computation based on income tax data
Note: Alternative series of the top 1 per cent income share for 1959-1987 are constructed from Employer census of all workers (see appendix)
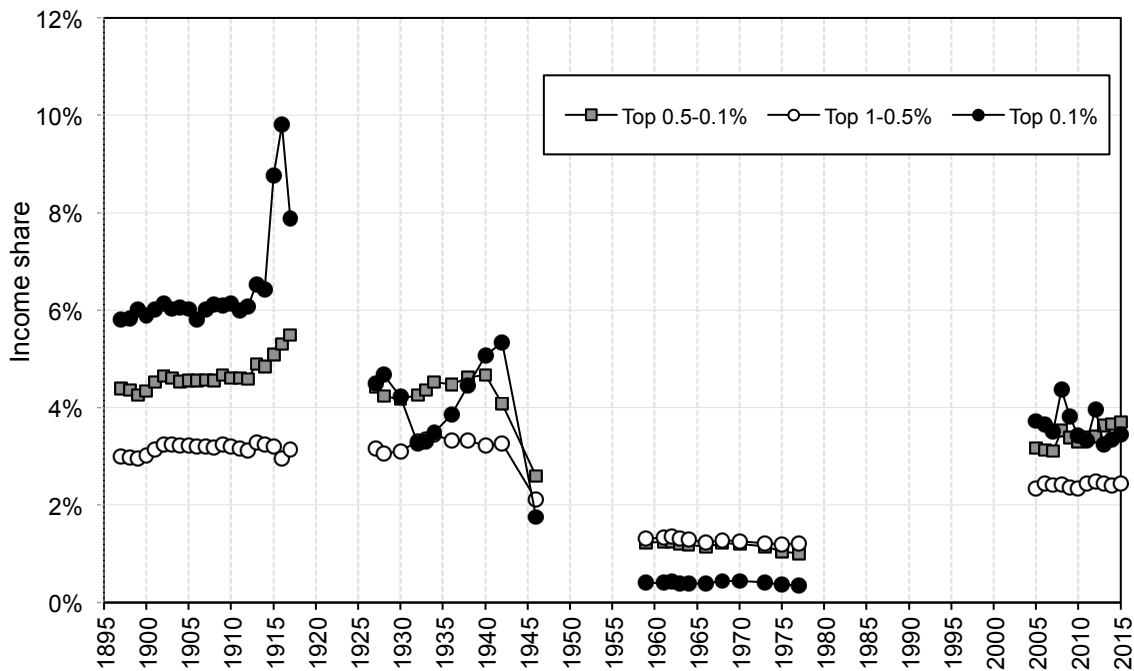


Figure 2: The decomposition of the top 1 per cent in the Czech Republic
Source: own calculation based on income tax data; estimates for 1959-1979 based on employer census of all workers
Note: 1927-1938 refers to the First Czechoslovak Republic; 1938-1944 to the Protectorate of Bohemia and Moravia;

# 4. The Czech Lands in Imperial Austria

## 4.1. The historical background: Industrialization in Central Europe

The Czech Lands were among the most developed region of the Habsburg Empire. The country has been rich in raw materials and located on important trade routes, especially its capital Prague. It abounded with highly skilled labour force, with the general educational attainment among highest in Europe.[4] The Lands prided itself on the centuries-long tradition of manufacturing, and many industries (such as textiles, the glass production, brewing, sugar refining, metallurgy etc.) were renowned outside its borders. In the simple outline, industrialization followed there the natural ('British-style') course, from textiles (to) and commercial agriculture, and later to heavy industry and engineering (Teichova 1988). The Czech Lands comprised almost three-quarters of the Empire's industry, while taking at the same time the lead in the intensive agriculture, with the sugar beet and hop particularly important for the emergence of commercial agriculture. The country's economy consequently assumed a unique 'agrarian-industrial' character (Kubu 2005).

As a starting point, it is useful to situate oneself in a broader historical context of the long-term development in the Czech Lands. The best available indicator of the long-term development in living standards in the Czech Lands is recently constructed real wage series by Cvrcek (2013), which stretches as far back to the 'Pre-March' era (*Vormärz*). Figure 3 shows the evolution of the real wage of a labourer in the province of Bohemia from the 1820s up to WWI. An observed trajectory can be ascertained in rough outlines thorough the lenses of the Habsburg economic history. First, the *Vormärz* (1815-1848) was characterized by the wage stagnation. A decade following the Revolution of 1848 was accompanied by a moderate increase in the real wage (1848-1858), but wages stagnated during the next decade. The greatest spur occurred during the so-called 'Founding period' (*Gründerzeit*; 1867-1873), but a strong upswing was terminated by the great financial crush of 1873 (the Vienna stock market crash), followed by the severe depression (the 'Great Depression'). From the mid 1880s the rising wage pattern set in and lasted unceasingly until WW1.

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[4] Largely as a consequence of Habsburg education reforms, such as the introduction of compulsory primary education under Maria Theresa or compulsory eight year schooling in 1869 (Melton 1988).

From 1867, the real wage development can be compared with the evolution of real output per worker (Schulze 2000, 2007; Cicarelli and Missiaia 2014). Figure 3 suggests that output experienced the same sharp fall and stagnation during the depression years, but its recovery in the 1890s had outpaced the wage rise, especially at the end of the decade. However, in contrast to the wage evolution, the output growth was halted at the turn of the century and regained its strength only from the mid 1900s, when it again notably outstripped the wage growth. This pattern corresponds to the conventional narrative of 1896-1901 and 1906-1913 as periods of the strong economic upswing, and 1902-1906 of the economic stagnation in the Habsburg Monarchy (Rudolph 1976, Good 1978; Komlos 1983).
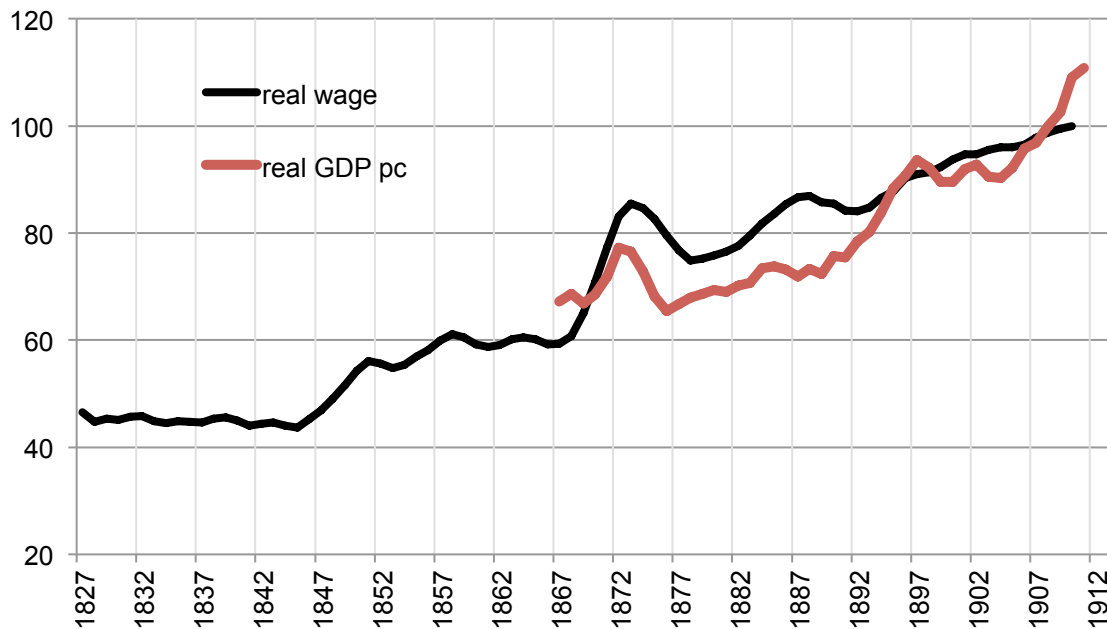


Figure 3: Development of real wage and real output per worker in Bohemia (1900=100)

Note: 3-year averages used to smooth series

Source: Real wage from Cvrček (2013), real GDP per capita from Schulze (2007) and Cicarelli and Missiaia (2014)

### Box 1: Distributional Effects of the Industrialization in Central Europe:

### The 'classical' view

Our analysis begins at dawn of the 20th century, which presents the culmination of the industrialization process accompanied by the thorough transformation of the Czech economy during the 'long nineteenth century'. The inevitable question intrinsic to this period is concerned with the distributional effect of industrialization. This question presents the crux of the literature on inverse-U (or Kuznets) curve. As is well known, Kuznets (1955) famously hypothesized that inequality rises in the early phases of industrialization,[1] but falls eventually at the more advanced stages of development. Consequently, a notion of the inverse-U (or Kuznets) curve was born. Although it is fair to say that the hypothesis has been somewhat 'overused', we believe that it is fair to raise it once more in the place of its origin, in Central Europe.[2] It is worth recalling that the rising inequality during the industrial take-off has been unambiguously confirmed only in the case of two German states, Saxony and Prussia, both neighbouring to the Czech Lands (Kaeble and Thomas 1991; Morrison 2000).

Industrialization of the Czech Lands evolved simultaneously and in direct contact with these areas. In general, one should not think of industrialization as occurring behind impregnable state borders (which were, besides, still very loosely defined at the time), but as a wider phenomenon shaped by day-to-day interactions and influences flowing between neighbouring regions. The historical link of the Czech Lands with German provinces was intense. The trade of the Czech lands had been traditionally oriented towards Germany (especially via the Elbe; Rudolph 1976, p. 45).[3] Most importantly, the local Germans, (later) more commonly referred to as Sudeten Germans, had been the constituent element in the Historic Lands and the important medium of transmitting new ideas and innovations from Germany and vice versa. Consequently, industrialization spread from these bordering areas, especially in the context of the common experience of the proto-industrialization in "the triangle of Saxony, Bohemia and Silesia" (Myška 1996, p. 188). Thus, it seems more natural to look at industrialization in Central Europe as a longer gradual process, rather than pinpointing specific (institutional) turning point, even if the critical one such as the Reform of 1848.[4]

The often-suggested mechanism behind rising inequality in Central Europe has been to attribute it to the rising capital share. Dumke (1991) thus finds that a rise of inequality during the industrialization in Prussia was related to the shift in the functional distribution of income towards capital income. The notion that early (modern) economic growth went along with rising profits and that the rich - necessarily at the time capitalists and great landlords - capture the greatest portion of the growth was obvious to contemporaries, such as Gustav Schmoller and adherents of the Historic school. Classical economists, together with the most of contemporaries, worked in a class-based framework and took for granted the fundamental inequality between capital (including profits and rents) and labour, where capital had resided at the top and labour at the bottom of the income distribution (hence, top incomes were essentially the 'capital income phenomenon'). Moreover, this inequality has been regarded as one of the stylized facts of the pre-WW1 social setting (Keynes 1919), allowing higher savings of the capitalist class (with higher propensity to save) and was beneficial for the capital accumulation, and hence for the economic growth. Kuznets (1955) also mentions the mechanism of concentrated saving in hands of high-income individuals. Accordingly, any shift in factor shares would have had an unambiguous impact on personal income distribution.[6]

Figure 3 thus suggests that the real wage in Czech Lands stagnated in the first half of the 19th

century, but embarked on the steady growth pattern in the second half of the century (Cvrček 2013). If the inception of industrialization (sparked by technology change) was accompanied by the general wage stagnation, then the onset of modern growth benefited the rich (following the discussion from above, there was a rise in capital share). Cvrček (2013) has surmised, based on "scattered" Kausel's estimates of GDP in Cisleithania in the first half of the century, that there was an "upward trend in income per capita unfolding alongside stagnant real wages." However, from the end of 1860s, there was a steady rise in wages, broadly in line with the output growth. We could thus say, following Robert Allen's account for Britain (2007), that the Czech development was characterized by the two distinctive phases. The first was the so-called Engels' pause, as Allen terms it, which is "the period of constant wages in the midst of rising output per worker". The onset of the British Industrial Revolution was accompanied by the wage stagnation, but industrialization eventually contributed to the rise in workers' living standard as well. Equally, Cvrček (2013, p. 26) believes that in Czech Lands "it seems that the economic growth eventually did trickle down all the way to common laborers and all social strata saw their fortunes improve."

Reference:

[1] Or generally speaking, with the beggining of the modern economic growth. The common interpretation of the initial rise in inequality is the sectoral shift of workforce from (assumedly) less productive and less unequal agricultural sector to more productive and more unequal industrial/urban sector. Accordingly, inequality eventually falls due to the income compression in the non-agricultural sector.
[2] Kuznets was in fact influenced by the work of Procopovich (1926), who showed rising inequality in Prussia during the second half of the 19th century (e.g., Geinsenberger and Mueller 1972; Dumke 1991; Grant 2005)
[3] Besides, overpowering influences flowing from Germany have induced many authors to see the Habsburg economy merely as a fringe of German-led Central European economy.
[4] The timing of the inception of the modern economic growth in the Habsburg Monarchy has been one of the most discussed issues in the Habsburg economic history this has been one of the (Marz, Rudolph, Komlos, Good, Gross, Schulze).
[5] Wages falling behind productivity advancements implied that capitalists could have reaped the benefits of the early growth through the increase of the profit share The rising capital share assumedly led to the rise in the interpersonal inequality since capital income is generally more unequally distributed than the labour income, (e.g. see Atkinson and Bourginon 2000; Atkinson 2009). Allen (2009) has noted: "The surge in inequality was intrinsic to the growth process: technical change increased the demand for capital and raised the profit rate and capital's share. The rise in profits, in turn, sustained the industrial revolution by financing the necessary capital accumulation."
[6] As a rough approximation of the relative shift in factor shares we can take a divergent evolution of the productivity and the real wage (that is, the labour share $LS = w/p$, where $w$ stands for the real wage and $p$ for the real labour productivity).

## 4.2. Top income shares during the *'Second Gründerzeit'*

The expounded historical background is a useful conceptual framework to understand both the level and the evolution of top income shares from the start of the 20th century until the First World War. This was a period of the renewed economic expansion, sometimes labelled as the 'Second founding period' (*second Gründerzeit*) in Central Europe,[5] commonly related to the high point of the 'Second Industrial Revolution'. A turn of the 19th to 20th century has been roughly

[5] Matis defines the 'Second Gründerzeit' as the 1896-1913 period.

identified as the peak of the inverse-U curve in (Central) Europe (e.g. Dumke 1991; Grant 2002;[6] Milanović 2016). In Prussia, as noted above, it presented a culmination of the steady rise of inequality that had lasted several decades, and was featured by the general stability in top shares until WW1.

Figure 4 suggests a similar evolution and levels of top shares in Prussia and Imperial Austria (Cisleithania) during two decades preceding WWI. Top income shares in Imperial Austria experienced slightly higher variability, in particular, they were more strongly hurt by the crisis in the early 1900s. But they generally moved in parallel to top incomes in Prussia, with a year to two lag. In fact, Good (1978, p. 180) posits that the international depression at the turn of the century came in Austria directly through Prussia. It seems that during this period top shares in both countries followed the business cycle fluctuation without a clear trend.

Following the above discussion, there was a sharp acceleration of the growth in the mid 1890s where the output growth outpaced the real wage (Figure 3). There was an increase in top shares during the economic boom of the 1890s,[7] which came to a halt with the turn-of-the-century depression. Good (1978, p. 97) has pointed out that there had been a shift towards capital share in Imperial Austria from the middle of the 1900s: "from this point real wages tended to stagnate or grow only slowly, while profits grew dramatically". Mosser's (1980) data show the explosion of business profits in the 1910-1913.[8]

In addition, it appears that the rise of the real wage was associated with the positive development in the wage distribution, providing further explanation for the stabilization of top inequality in the two decades leading to WW1. In this respect, Kocka has advanced that the 'Second Industrial Revolution' in Central Europe led to certain 'job deskilling', notably due to the technology change and workplace reorganization (Kaeble 1986, p. 72). Coupled with the introduction of general education, this led to a fall in skill premium between white-collar and manual workers and resulted in equitable apportionment of rising wages. Finally, the precedence

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[6] Grant (2002), for instance, conjectures that the peak of the 'Prussian Kuznets curve' occurred in 1906.

[7] However, one should be cautious about the magnitude of the increase in the late 1890s, experienced both by the top 1 and the top 5-1 per cent, as this could also indicate more rigorous enforcement and gradual improvement in the tax collection after the comprehensive income tax had been put in work in 1898.

[8] One could infer, with the obvious risk of oversimplification, that capital (labour) share expanded (contracted) in the in the last decades of the 19th century, while the proportional growth of wages and productivity could have resulted in stability of top shares from the mid-1900s until the Great War, as this would, in theory, imply the stability of distributive shares.

of the broad social legislation in Central Europe, in Germany under Bismarck and in Imperial Austria under Taaffe (such as workers insurance and labour protection; compulsory social insurance was introduce in Bohemia and Moravia in 1888 (Teichova 1988)), conceivably improved the lot of the working class. This might be to a large extent related to the adverse distributional impact of industrialization in Central Europe in the course of the 19th century.
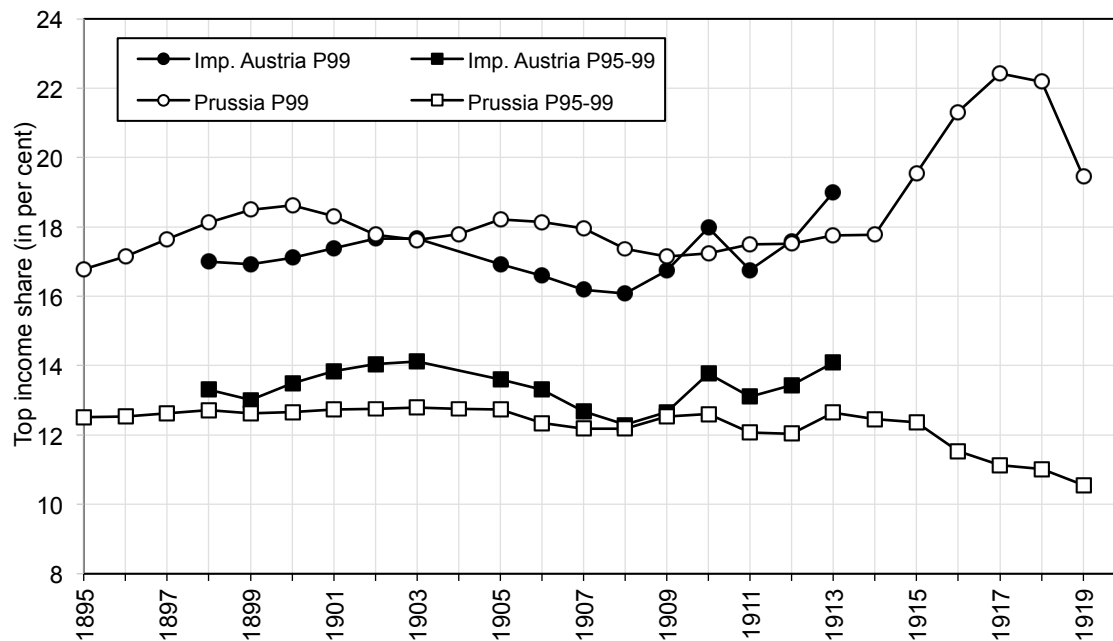


Figure 4: Top income shares in Central Europe: Imperial Austria (Cisleithania) and Prussia
Source: Imperial Austria: author's computation based on income tax statistics; Prussia: WID, Dell 2007

A grasp on the income composition of top income groups has proven to be especially helpful to pinpoint different economic mechanisms affecting the income distribution, and could shed additional light on the balance between capital and labour income at the top. Unfortunately, it is available only the total reported income by sources of all taxpayers,[9] but looking at it could be nonetheless rewarding. Figure 5 thus presents income sources of all taxpayers, comprising roughly the top 5 per cent of the population.[10] It can be seen that top incomes were dominantly composed of capital income - broadly defined in opposition to labour income - such as profits from industrial and commercial businesses[11], from land, financial capital and rents. Income from

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[9] There is no available composition at the bracket level to ascertain income sources of the specific top income groups.
[10] This proportion was fairly stable until WW1, when it rose, to comprise close to the top 10 per cent of taxpayers at the end of the war.
[11] Note that business income was the predominant form of capital income in Austria-Hungary due to the fact that incorporated organizations were much less popular, in particular due to disadvantageous tax treatment (see Rudolph 1976, pp. 159-162).

employment, on the other hand, represented around one third of the top quintile's total income in the decade preceding the First World War. The figure further shows that the top income composition had remained quite stable until WW1, while the war resulted in the marked 'wage squeeze'. It is plausible to assume, on the basis of the documented patterns during the War and in the interwar period (as discussed below), that the capital income was strongly concentrated at the top of the income distribution (such as the top 1 per cent and above), while the labour income was more prevalent income source of the 'lower' constituent groups (such as the top 5-1 per cent). Figure 5 shows that employment income slightly expanded during the 1900-5 period. The sharp rise in top shares in 1913 could be explained by the rise in the proportion of the business and capital income.
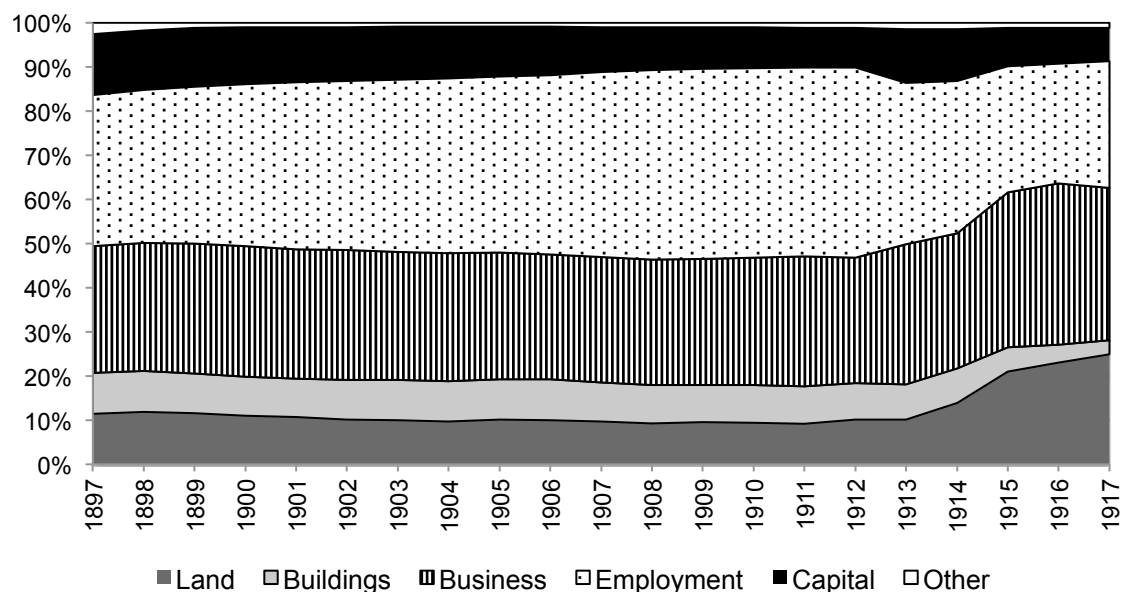


Figure 5: Income composition of all taxpayers in the Czech Lands (Bohemia, Moravia and Silesia), 1897-1917
Source: author's calculation based on the income tax data

## 'Vienna' effect

Finally, top income estimates during the Austria-Hungary should be seen as the lower bound. One needs to bear in mind that in contrast to other countries for which top incomes series have been constructed and which have been independent political units, the Czech Lands were until 1919 a constituent part of Imperial Austria (Cisleithania). It is well documented that there had been strong tendencies for high incomes to concentrate in the capital city, Vienna.

Consequently, incomes generated in various regions of the Monarchy were liable to personal income tax in the region of Lower Austria. The capital income is the apparent illustration, as it has been documented that many (if not most) of the 'grand capitalists' resided in Vienna. Take, for example, only the largest industrial concerns in the Czech Lands, such as Vitkovice Works[12] owned by the Viennese Rotschilds and Gutmanns, or the Mining and Metalurgic Co. owned by the Archduke Friedrich von Habsburg. Obviously, the same kind of 'bias' occurs in every country where foreigners own disproportionally high share of the domestic capital stock,[13] or in countries where richer regions own other less prosperous ones, but it has been generally acknowledged that Vienna held exceptionally important place in the economy of Imperial Austria.[14] Figure 6 shows that the 'Vienna' effect was quite important for the very top groups, such as the top 0.1 per cent, where, conceivably, capital income predominated. The transfer of property income was clearly more important in the case of the Czech Lands (as the industrial stronghold of the Monarchy) than for other Habsburg provinces.[15] For example, one might tentatively argue that this is the reason why the profit boom in the early 1910s was more visible in top shares in Imperial Austria as a whole (Figure 4) than in the Czech Lands (Figure 1).
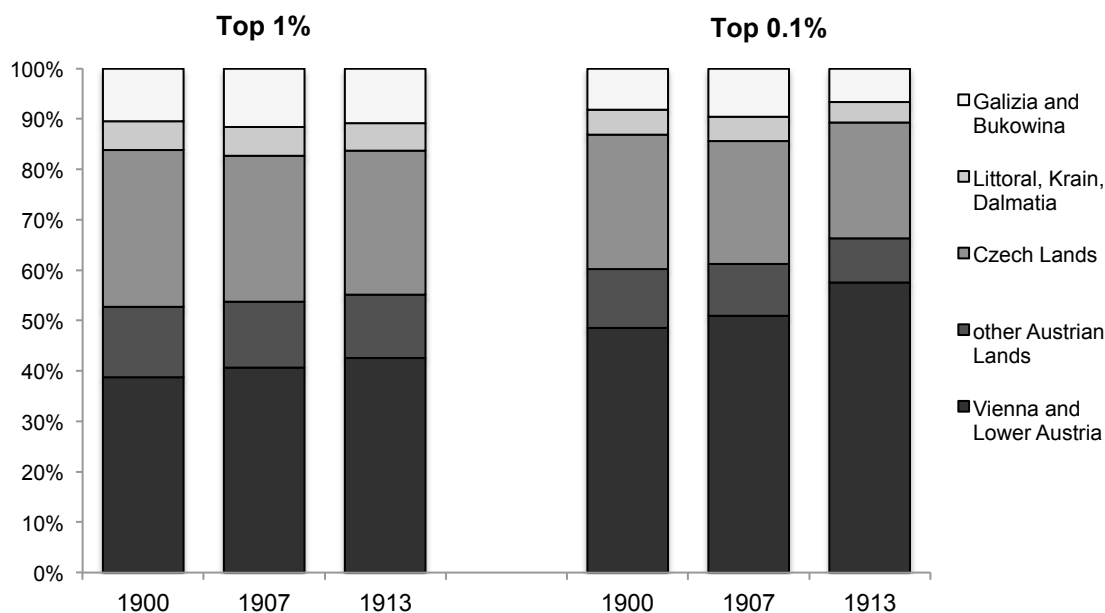


Figure 6: Regional composition of top income groups in Imperial Austria
Source: authors' computation based on the income tax statistics

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[12] For example, Teichova (1974, p. 88) gives a revealing account (although referring to the interwar period): "foreign investors regularly skimmed off almost the whole net earnings of the Vitkovice combine, a fairly significant part of the Czechoslovak national income".

[13] The extreme examples were British and French colonial empires (Piketty 2014).

[14] A similar 'bias' occurs today when rich 'capitalists' increasingly transfer their wealth to tax havens and are, as a result, missing from the interpersonal inequality within a county (Zucman 2015).

[15] Clearly, it had been problematic that profits obtained in the Czech Lands were not reinvested there.

Figure 7 shows the average income of the top 1 per cent in various provinces of Imperial Austria. It can be seen that the top 1 per cent in Lower Austria were disproportionately richer than their counterparts in other Cisleithanian provinces, which cannot be explained by the difference in the relative living standards or other economic indicators. Importantly, such concentration of the economic, and together with it of the political power, made strong impression on relatively young national consciousness in many parts of the Monarchy, in the first place on that of the Czechs.
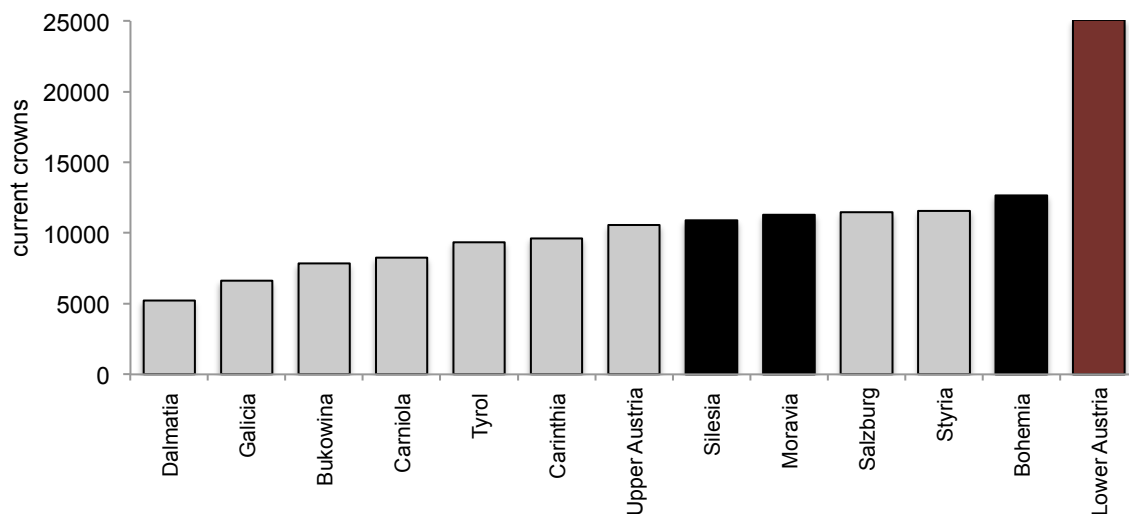


Figure 7: 'Vienna effect': the average income of top 1 per cent in Cisleithania in 1910
Source: author's computation based on the income tax data

Furthermore, most of the top salaried officials from various parts of the Monarchy were fictionally settled in Vienna for tax purposes. Namely, special sales offices consisting of top remunerated employees were formed outside the companies (the so-called *Betriebe*). As Rašin (1923, pp. 135-7) noted, this was primarily due to fiscal reasons, since communal taxes that were levied on the basis of corporate income tax obligation, were in the significant part paid to communes where company had its head-office, while the rest went to communes where company actually carried its economic operations. If there were several locations where firms operated, then this tax was split between communes according to paid compensation to employees.

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Here, we should be reminded of history of ethnic rivalries in Central Europe. A marked distinction of social classes along ethnic lines during the industrialization in Central Eastern Europe implied

that distributional conflict assumed additional dimension, and could have contributed to growing national consciousness (e.g. Gellner 1983) and to what Hroch (1985, 2015) called 'nationally relevant conflict'. Major economic and social changes in the late 19th century heightened 'social consciousness' of Czechs, reacting to the overarching influence of 'foreign' landholding nobility, or the critical role of 'nonindigenous' middle (and eventually capitalist) class in CE Europe (notably Germans and Jews; Bernend 1989). The conflict between Czechs and Germans had been especially pronounced in both the economic and the political sphere, and had traditionally burdened the Habsburg Monarchy (Bauer 1907; Taylor 1948; Judson 1996).[16]

## Social structures during the industrialization: the 'persistence of the Old Regime'

Further, tracking the evolution of high land incomes from the end of the 19th century is especially interesting, since the transition to the modern world has been often seen as a transformation of landed wealth into 'modern' forms of wealth (industry, finance, etc.). In Central Eastern Europe, this transformation occurred relatively later than in the west of the continent, and we find among these industrial 'laggards' a disproportionally greater role of land income in top income shares. Actually, one interesting finding of this work has been to show that big landed wealth occupied the very top of the wealth distribution in the Czech Lands still during the first decades of the 20th century (Figure 24; see section 5.4.). In consequence, one observes here social phenomena intermingling both remnants of feudalism and the prominent role of landed estates as drivers of industrialization and factors of the social change. Quite importantly, landed nobility exerted strong influence on the political process (i.e., in Germany all the way up to WW2[17]) and regularly enjoyed the privileged economic treatment.[18]

Industrialization in central-eastern Europe underwent a unique course and one of its notable features had been the entrepreneurial outlook of landed estates. For example, the (proto-)industrialization in Czech Lands had been characterized by the unusually high participation of

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[16] However, it would be an oversimplification to look solely through the 'ethnic' prism, since rich historical and sociological work has made us aware that large economic and social changes unleashed complex microcosm of social structures (Cohen 1981; Brubaker 2005).

[17] The classical (negative) account are Gerschenkron (1944), Dahrendorf (1965), Wehler (1985), etc.

[18] For example, through the electorate system; then (austro-)corporatism from the 19th century; then in the realm of taxation or industrialization policy (subsidies, tariffs)).

nobles in the development of manufacturing (Myška 1996). One may draw a link to peculiar phenomenon of commercial demesne holding, which assumed a prominent place from the time of the economic recovery in the 17th century and the presumed emergence of the 'agrarian dualism' in Europe[19] (when the landlords in central east Europe had derived bulk of their income from commercial pursuits, in contrast to their counterparts in Western Europe, who had chiefly relied on rental income (Blum 1957, p. 822)). Moreover, this entrepreneurial involvement happened against the background of the so-called 'Second serfdom' in central east Europe, assumedly marked by the increase in feudal constraints after the late Middle Age crisis and especially after the depopulation caused by the Thirty-year wars. [20]

The structural change in central east Europe was, as often advanced, associated with the strong increase in the inequality (e.g., in Prussia or Saxony). Prussian and Czech trajectories were linked in a yet closer tie through the central role that commercial agriculture assumed in bringing about the large-scale industrialization in both countries. This process was characterized in Central Europe by the transformation of large noble estates into true capitalist undertakings (Lacina 1990), what Lenin (1907) famously labelled as the 'Prussian road' to capitalism. The role of noble rural estates as agents of social change had been relatively more important than in Western Europe. Noble latifundia dominated the rural landscape in central east Europe and took the lead in introducing the commercial agriculture. For example, it has been documented that most of the greatest landed magnates in the Czech Lands (Tables A5 and A6), were pioneers in introducing the agrarian capitalism into the country (Klima 1991; Blum 1957).[21] In Germany, similarly, the agricultural production had become strongly capital intensive, and, moreover, Dumke (1991) has shown that it was actually the capital share in agriculture that increased in the second half of the 19th century and induced a rise in the aggregate capital share.[22] At the same time, a thorough transformation had spread through the Czech agriculture, with the production of

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[19] Kriedte roughly placed the river Elbe as a dividing line (cited in Cerman 2012).

[20] This is not a place to dwell upon the actuality or the legacies of the 'Second Serfdom', but it suffices to point out here that the traditional view, focused on factor endowments (e.g. Domar 1970) and ensuing 'commercial' engagement of landlords at rent extraction by weakening peasant economies (e.g. robota or estates sale monopolies), is oversimplification (see Cerman (2012) for the most thorough survey). But what this unmistakably reveals is that the social structure was important for the industrialization in the Czech Lands, and that the role of commercial landed enterprises (not necessarily the nobility itself, since in many occasions it implied hired foreign entrepreneurs) especially evolving as an agent of social change (Klima 1979; Rudolph 1980; for general debate see Brenner 1976).

[21] Myška has noted: "estate owners transformed themselves into great agrarian capitalists" (translation from Glassheim 2005, p. 13).

[22] Dumke (1991) shows that the evolution of inequality displays high correlation with the capital share, and interprets it as a clear sign that the rising capital share spurred the rise in personal inequality. Capital share in industry did not increase. Importantly, Dumke shows that this development would have been missed if one looked only at skill wage differential which did not rise throughout this period.

'industrial' crops as sugar beet being fundamental in driving this process.[23] Blum (1957) moreover notes that a turn towards capitalist agriculture occurred earlier in Habsburg lands than in Germany. Already during the *Vormärz* (1815-1848) the lands of Bohemian crown took the precedence among the so-called German Confederation in advancing commercial agriculture.

In line with the Dumke's finding, we find that the agricultural revolution in Prussian Poland in two decades preceding WW1 was accompanied by a notable increase in top incomes (Bukowski and Novokmet 2017), which were almost exclusively obtained in the countryside.[24] It is well-known that Poznania and Pomerania were archetype of East-Elbian latifundia (Figure 8).
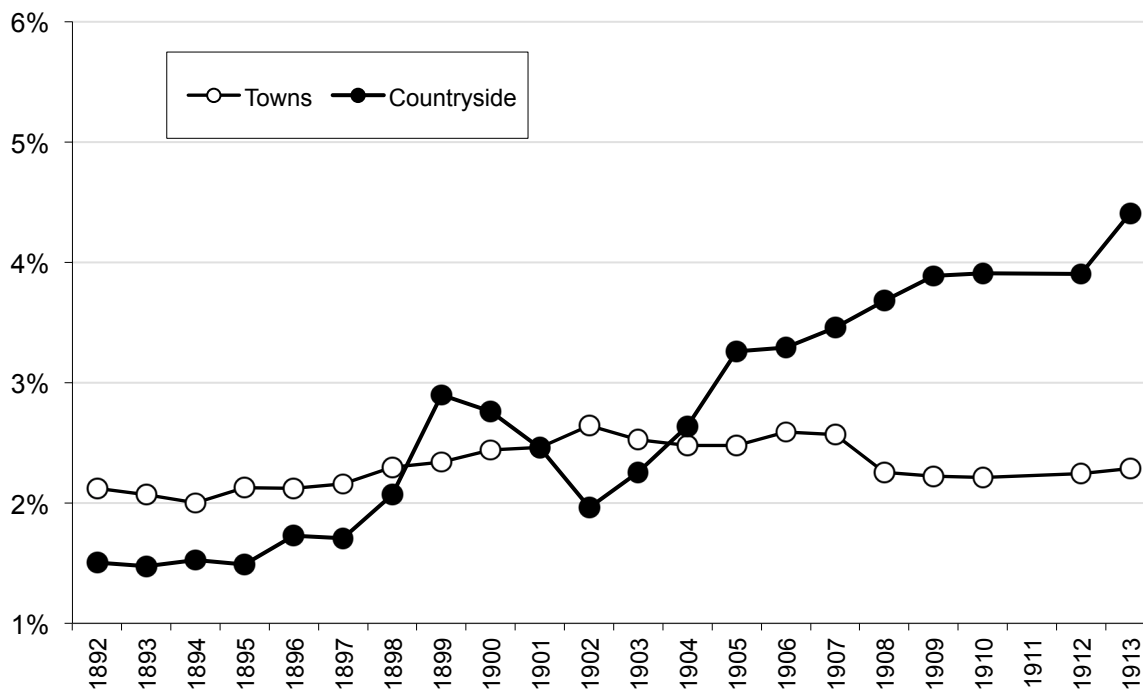


Figure 8: Top 0.1 in Poznania (Prussian Poland)
Source: Bukowski and Novokmet 2017

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[23] Rudolph (1976, pp. 47-8), for example, stresses the central place of sugar beet industry for the diffusion of market-orientation in the Czech Lands. Grant (2002) equally posits for Eastern Germany. Due to its prominent place for the evolution of income distribution, Dumke (1991, p.143) refers to it as the "sugar beet theory of income distribution".

[24] The process of rising capital share, driven by rising capital intensity in agriculture, assumedly came to a standstill in Prussia in the 1890s, and the period leading to WW1 saw a remarkable stability in top concentration, after which additional increase of capital intensity in agriculture did not further contribute to an increase in the aggregate capital share (Dumke 1991, Morrisson 2000). However in east Prussian provinces, the rise in agriculture continued to make impact even after 1890s (Muller and Geinseberg 1975), in particular in the province of Posen (chapter 2).

The nobles' participation in commercial agriculture, mining, and other industrial branches in the Czech Lands was central in promoting capital accumulation during the country's industrialization (Rudolph 1976). The 'industrial-agricultural' character of the Czech Lands manifested itself accordingly on the patterns of top concentration. Big landed wealth mingled with industrial and financial capital at the upper echelons of the economic and the political power. One thus finds among Bohemian landlords in Table A5 the most prominent Habsburg statesmen (e.g. Schwarzerberg or Lobkowitz families) and the cream of the empire's society, the so-called 'First society'. The 'persistence of the Old Regime', as propounded by Arno Mayer (1971), probably nowhere manifested itself more than in Central Europe until the First World War.

Figure 5 shows that land income accounted for around 10 per cent of the top quintile's income in the Czech Lands prior to WWI, but as land distribution was extremely skewed to the right, this income was largely concentrated in the hands of higher top groups, such as the top 1 per cent and above (see section 4.2. below). Table 1 indeed indicates a striking land inequality in the Czech Lands at the end of the 19th century, which was notably higher than in other Cisleithanian Habsburg provinces (e.g. than in Austrian Lands, and more similar to Hungary). Similarly, according to the *Handbuch der Millionäre* most of German millionaires before the First World War were large landowners (Evans 2016; Baten and Schulz 2005, p. 49), and to draw analogy still further, most of them resided in neighbouring Silesia[25] (Eddie 2008), itself a Habsburg province until Frederick the Great annexed it to Prussia during the so-called Silesian wars.[26]

|  | Gini index | Bottom 50% | Top 20% | Top 10% | Top 5% | Top 1% | Top 0.1% | Top 0.05% |
|---|---|---|---|---|---|---|---|---|
| Bohemia | 84,2% | 1,7% | 88,3% | 75,2% | 62,1% | 43,9% | 33,1% | 27,9% |
| Moravia | 84,1% | 2,3% | 89,0% | 76,5% | 63,7% | 42,4% | 32,6% | 29,0% |
| Silesia | 83,0% | 2,5% | 85,8% | 74,3% | 63,5% | 48,5% | 38,9% | 32,6% |

Table 1: Land distribution in the Czech Lands in 1896
Source: own calculation from *Grundbesitzstatistik*
Note: Pareto interpolation used to obtain specific land shares

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[25] Futhermore, many Silesian land magnates, such as Donnermarcks (whose wealth in Germany came second only behind the Krupp family), had estates both in Prussia and the Habsburg Monarchy.
[26] A small part of former Habsburg Silesia is Czech historic land (whose center is Ostrava). This should be distinguished from the larger part that was the Prussian province Silesia (which became a part of Poland after WW2).

In addition, the Czech Lands show much higher level of landed industries than found in other Habsburg provinces (Medinger 1919, p. 47)).[27] Rudolph (1980, p. 58) notes that "nowhere in Central Europe does it appear that there was an aristocratic or landed class so involved in manufacture as that of Bohemia". Big landlords in Czech Lands assumed the leading, or at least a prominent role, in metallurgy and mining, textiles, food processing, glass production etc. (Cerman 2012, pp. 32-3)[28], which were the most significant industrial branches at the beginning of the 20th century.

It is not our contention to dismiss the importance of the urban, or the 'bourgeois', element for the growth of industry in the Czech Lands, in particular in north-western Bohemia, where, in line with the Mendels' (1972) classic account of proto-industrialization, the rural cottage industry was gradually replaced by the urban factory production (Klima 1974) (e.g. textile industry in Liberec).[29] Instead, it should be recognized that (proto-)industrialization in the Czech Lands was to a substantial extent carried by noble estates, and well before 1848 (Rudolph 1980; Cerman 2012, p. 33), hence in opposition to oversimplified historical narratives traditionally contrasting 'progressive' bourgeoisie with 'reactionary' landlords (especially in east-central Europe before the serf emancipation).[30] As pointed by Blum (1957), it were exactly big noble landowners-entrepreneurs that most strongly promoted the reform of 1848 (and the reform might have been a product of on-going capitalist development rather than its precondition, e.g. Komlos 1983).

Indications of the evolutionary process, from landed large estates to industrial factories, might be also surmised from Mosser's (1983) investigation of big Habsburg firms, in which he finds significant portions of agricultural land among firms' assets.[31] The evolutionary path should not be seen as irreconcilable to 'big spurt' theories, quite prominent in central-east European economic history (such as Gerschekron's 'substitutes for prerequisites'). A substantial government support for industrial development in the 18th and 19th century had been primarily directed at noble landlords, aimed to further existing industries on their estates (Rudolph 1980). In addition, strong protectionism in the Monarchy pursued through the tariff policy was

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[27] Eddie (2008) has similarly challenged the conventional wisdom of backward agriculture and the absence of industries on Junkers' estates in East-Elbian Prussian provinces.

[28] For example, Rudolph (1976, p. 51) states that nobility owned almost all iron production.

[29] Neither we aim to dwell on the debate whether the agricultural revolution was necessary precondition of the industrial revolution (see Brenner 1982, Allen 1992, Craft 1985).

[30] One is reminded of the famous line from Lampedusa's *Gatopardo*: "If we want things to stay as they are, things will have to change".

[31] For example, Škoda Works in Plzen, one of the largest industrial concerns in the Czech Lands throughout the 20th century until today, is an illustrative example of this evolution, starting as the machine building enterprise for the sugar industry of the noble Waldstein family, before Emil Škoda purchased it in 1869 (Rudolph 1976, p. 122).

"supported by a coalition of the landed aristocracy, large industrial magnates, and directors of the Viennese Great Banks, who were often the self-same person" (Rudolph 1976, p. 17), a coalition reminiscent of the 'marriage of iron and rye' in Germany.[32] The nobles were the important link in the rising *Austro-corporatism* (Tálos and Kittel 1996). The role of banks rose in particular in the last decades of the 19th century (Rudolph 1976), and it is important in the context of 'big spurt' theories. Banks promoted cartelization as their risk management policy, leading to pervasive oligopolistic structures in the heavy industry, engineering, banking and finance, etc.[33]

Figure 9 suggests relatively high structural concentration in the pre-WWI period both in the Czech Lands and Germany by looking at 'shares within shares'. This measure is useful, as it is independent of the total income denominator and thus robust to measurement errors inherent in the total income estimates (Atkinson 2007a)[34]. The figure depicts the share of the top 0.1 within the share of the top 1 in the Czech Lands and Germany until the end of WW2 (after which the institutional framework diverged). In both countries, the income of the top percentile had been disproportionally concentrated in the hands of the richest individuals. We observe a remarkably similar evolution of the top concentration, and this high positive correlation offers convincing evidence of similarity in top distributional patters of the very top groups in the two countries. Interestingly, high correlation continued in the interwar period, at which we look below.

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[32] As Friedrich Engels noted: "aristocracy had left the old and respectable days behind and now swell the lists of directors of all sorts of sound and unsound joint-stock companies" (cited from Evans 2016)

[33] For example, it has been often suggested that the Empire's industrial structure had been highly concentrated, displaying strong monopolistic tendencies. Thus, Central Europe - and Germany and Austria-Hungary above all - became a synonym for the late nineteenth and the early twentieth century dominance of concentrated business structures that interweaved the whole economy (Teichova 1974; Cotrell and Teichova 1983). This could be plausibly related to the specific character of the Second industrial revolution with large units in the producer goods industries (Chandler 1977). A relative backwardness of Central and Eastern Europe precluded significant state intervention in promoting industrialization (acting as Gerschenkron's 'substitutes for prerequisites') and banks especially had a prominent role in pooling funds as well as in promoting cartelization as a part of their risk-management strategy (Hilferding 1923, Rudolph 1976). In addition, the Empire's protectionist policy relieved Czech industry from foreign competition (Teichova 1988, p. 17).

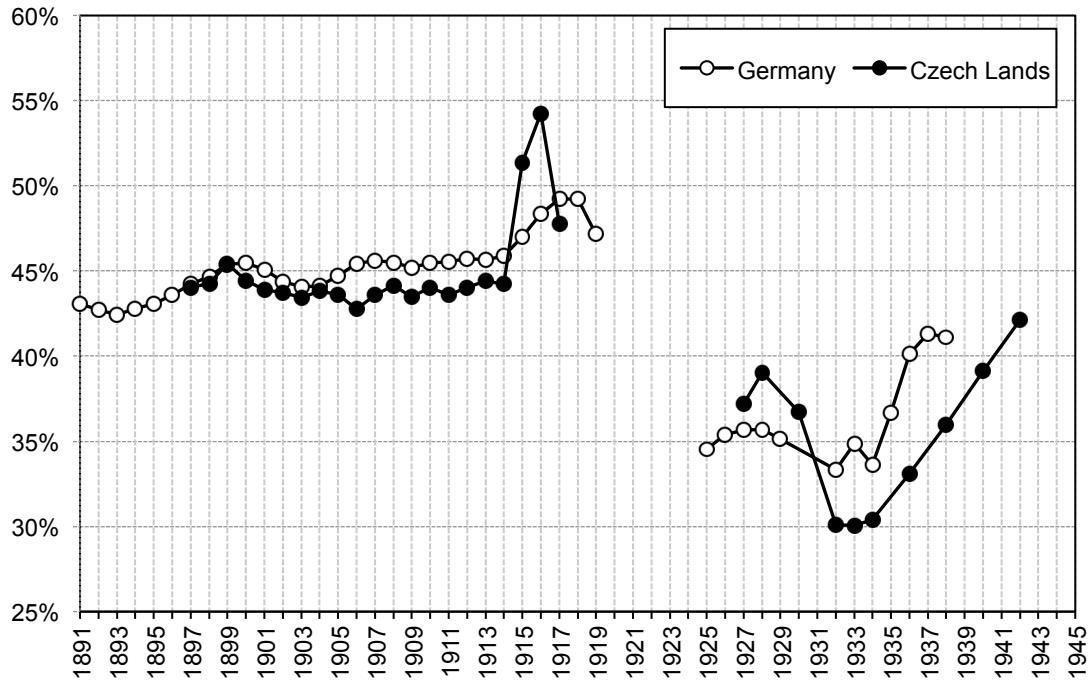[34] Which are often critical for the earlier periods

Figure 9: Share of the top 0.1% in the top 1% in the Czech Lands and Germany
Source: Czech Lands: own computation; Germany: Dell (2007)
Note: 1928-1936 refers to First Czechoslovak Republic; 1891-1918 for Germany refer to Prussia

* * *

The 'functional distribution' narrative of the Kuznets process attaches much explanatory weight on the top of distribution. If a parallel was drawn to (eastern) Germany, which had undergone a similar industrialization path, it seems natural to compare the Czech experience to other regions in the Habsburg Empire, especially since the highly industrialized economic base and intensive agriculture of the Czech Lands stood in stark contrast to the predominantly backward agricultural character of other parts of the Empire. Figure 10 compares top concentration in Bohemia and Lower Austria on the one hand, as the industrially most developed regions in the Empire, and Bukowina and Dalmatia on the other, as the least developed regions and still of the predominantly agricultural character. The indicator used is the inverted Pareto-coefficient b, with higher b indicating stronger concentration and higher inequality (Atkinson et al. 2011). It can be seen that developed and industrial regions show higher concentration than less developed and agricultural regions of the Empire. Structural change in the advanced regions in Empire might have resulted in functional shift toward capital and higher concentration of capital income.
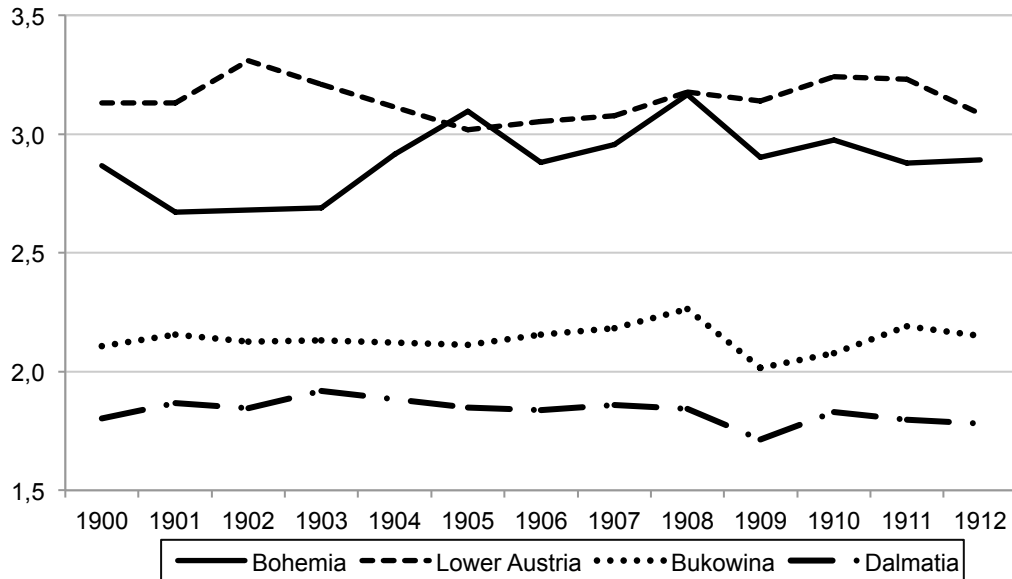
Figure 10: Inverted Pareto-Lorenz coefficient b

Note: $b = (a - 1)/a$; Pareto coefficient $a$ is calculated from the share of the top 0.1 per cent in the top 1 per cent: $a = (1 + \log_{10}(S_{0.1}/S_1))$

## 4.3. The Great War

The First World War caused the collapse of the economic activity in Austria-Hungary. Schulze (2005) estimates that real GDP at the end of the war was barely 60 per cent of the pre-war 1913 level. The outbreak of the Great War caused an unprecedented surge in concentration at the top, with the top 0.1 per cent share jumping by more than 50% in the period between 1914 and 1917 (see also Prokopovich 1925). Figures 1 and 2 reveal in addition that the concentration at the very top, as evidenced by shares of the top 0.1 per cent and above, attained during the Habsburg era its secular maximum and the Great War signified its peak. In Austria-Hungary, highly regulated war economy brought closer the state and the heavy industry with the top policy priority attached to the armament production. Schulze (2005) points to the precedence of war industries, energy and metallurgical sector - in short, sectors where Czech Lands were especially prominent.[35] The Czech Lands, as the industrial stronghold of the monarchy, had to assume an important contribution to the overall war effort.[36] Cottrell and Teichova (2000, p. 53)

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[35] For example, Schulze (2005) quotes Riedl's (1932) estimates according to which state military needs absorbed as much as 85% of the total steel production, while before the War military demands did not exceed 5% of the total steel production.

[36] And the importance of armament production in the Czech Lands has been shown repeatedly during the course of the twentieth century, as the country figured prominently both in the of Nazi war effort or later for Soviets during the Cold War arms race (the Figure points that interwar period where similarly the rise of industrial profits was induced by armament production (Teichova 1974)).

similarly point to the strong increase in industrial concentration. As stressed by Morrison (2000, p. 249), the war stands as a clear example of the importance of political variable in shaping income distribution. A dramatic increase in concentration at the very top occurred in most of European countries during the Great War, such as Germany, France, Netherlands, or Sweden, among others.[37]

Figure 5 shows that land income experienced the largest proportional rise during the war. Its share in the total reported income rose from 10 per cent in 1913 to 25 per cent in 1918. Food prices literally exploded during the war (while the famine reigned), conceivably bringing exorbitant rewards to large agriculturalists.[38] Next, business profits similarly experienced a robust growth during the war. However, one cannot tell whether smaller entrepreneurs and self-employees also benefited from this rise, or if it was disproportionately captured by big business owners deriving profits from large unincorporated industrial enterprises benefiting, as argued, from the war economy.[39] Salaries and wages, in contrast, experienced a strong contraction, and its proportion in the total reported income shrank by a third, falling from 43 per cent in 1913 to 29 per cent in 1918. Finally, rental income was unsurprisingly negatively affected by the wartime inflation and rent controls (Rašin 1923).

What can be said with regard to diverging wartime patterns of the top 1 per cent and the top 5-1 per cent groups (Figure 1) in the light of these findings? First, it may be conjectured that the top percentile and higher income groups, which saw a jump in their shares during the war, were primarily comprised of capital income, while the adversely affected groups below were mainly composed of employment income. Thus, the war resulted in the redistribution at the top plausibly through the wage squeeze. Next, our results suggest that the surge in the top 1 per cent was exclusively limited to the top 0.1 per cent group, while lower constituent groups generally did not take part in this 'roller coaster' (Figure 2). In agreement with a widespread public perception at the time, we find indeed an evidence of spectacular enrichment of certain individuals, but it seems that it had been limited to the small number of big (armament producing) businessmen and landowners.

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[37] But the global reach of the war implied that the equal shooting up at the top happened simultaneously around the globe, from Canada to Japan (Atkinson and Piketty 2007, 2010).

[38] It should be added that Czech Lands were important food producer (Moravia in particular) in the Empire.

[39] There is a possibility that the decline in income of smaller businessmen was only less steep in comparison to the documented plunge in the total income.

Here, one may draw a parallel to the debate in German economic history regarding the distributional effect of the First World War. Notably, Baten and Schulz (2005) and Ritschl (2005) have challenged Kocka's popular hypothesis that there was a massive redistribution between capital and labour in Germany during the War, and consequently a large increase in the overall inequality. While the former authors do not deny the existence of certain number of 'outliers' corresponding to the popular picture of war profiteers, they argue that entrepreneurs were in large adversely affected by the war, that is, they experienced the fate similar to that of wage earners.[40]

## 5. The First Republic

Our series re-emerge only a decade later, in 1927 (the tax statistics for the early 1920s was not produced). Figure 1 has suggested that important changes in top income patterns had occurred during this period. Notably, the top percentile and the top 5-1 per cent groups swapped places in comparison to the previous period. While the latter group suffered disproportionally during the Great War, its share emerges at notably higher levels ten years later. This is yet another interesting finding made possible by the use the tax data.

Here again the income composition of different top groups has been central to understand observed top income patterns. In the previous section we suggested that the top 5-1 per cent group in Imperial Austria was dominantly composed of employment income. And this was still the case during the interwar period, as we show in a moment. On the other hand, higher top income groups, comprised of capital income recipients, suffered a notable fall in their shares after they had experienced a secular peak during the WW1. In the same manner, higher 'structural' concentration at the top that featured for the Habsburg period was notably reduced (Figure 4), suggesting that certain redistribution occurred within the top percentile. Figure 2 indicates that the very top shares, which surged during the war, such as the 'inflated' top 0.1 per cent, in the same way stumbled immediately afterwards. One can hypothesize that the drop was similarly sharp during the first years after the war. The immediate post-war years were chaotic, characterized by the political turmoil as the old empire was dismembered and the economy on the brink of the catastrophe. Conceivably, the effects on industrial profits were disastrous as the

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[40] For example, Dell (2007, p. 372) ponders that the fall of share the top 5-1 per cent group in Germany during the war could be identified with smaller businesses.

market suddenly shrank and its traditional export markets, such as Germany or South-Eastern Europe, sunk into chaos.

On the other hand, the mid 1920s marked a gradual economic recovery. After the successful stabilization, the 'golden years' of the First Republic ensued. The pre-war output levels were already reached by 1924 (Pryor et al. 1971, Teichova 1988). The subsequent prosperity was quite likely shared by all top income groups. This picture would roughly correspond to the historical narrative portraying the first years of the Czechoslovakia's existence. In the same way, the absence (or relatively milder blow) of shocks that plagued the surrounding countries in the first half of the decade – notably the hyperinflation in Weimar Germany, Austria, Poland or Hungary – could partly explain comparatively more robust standing of Czechoslovak top shares in the mid-1920s.

## 5.1. *Volksstumskampf:* The Economic Nationalism

But more importantly, the post-WWI period was one of unique historic moments when extraordinary government intervention brought about fundamental changes in the distributional sphere. As pointed by Morrisson (2000, p. 250), "such interventions are usually made in an exceptional political climate, such as a revolution or a war, and they correspond to an upheaval of political and social balance". He further adds that such measures are unfailingly directed at wealth distribution, which inevitably leads to enduring decline in inequality.

However, it should be recognized that there was more than one mechanism at work in driving the observed patterns. The interwar period has usually been depicted as the arena of the intense class struggle, when the political action pushed the balance to the side of the labour. This generally proceeded from external pressures rather than the enlightened attitude of the government.[41] The post-war period was characterized by strong radicalization, the threat of communist overthrow, strong trade unions and massive strikes (notably, the December strike in 1920). The recent Bolshevik revolution in the Soviet Union still resonated strongly (or for that matter the uprising in the immediate neighbourhood, in Hungary under Bela Kun (Miller 1999)[42]. The response of the Czechoslovak government was to introduce plausibly the broadest package

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[41]Although the genuine humanist inclinations should not be denied in the case of many contemporanous politicans, most notably Masaryk (e.g. «Social Question»)

[42] Ensuing concessions could be understood in the framework of the 'political Kuznets curve' as proposed by Acemoglu and Robinson (2002).

of social legislation measures at the time, including the eight-hour working day, unemployment benefits (under the Ghent system), workers councils, sickness and accident insurance, and large-scale housing program, among others (Agnew 2004 p. 184).

Regarding the general improvement of the workers' position[43], one should emphasize that high-salaried employees, quite likely those constituting the top 5-1 per cent, reaped the greatest benefits from this development. For example, salary scales introduced in 1926 (the year before the tax data become available) made this group relatively better off (Teichova 1988).[44] The First Republic is frequently seen as the golden age for high salaried white-collar workers and civil servants, and not rarely, these are identified with the ascendant Czech bourgeoisie. Here one should also include professors, lawyers, physicians whose social status was especially prominent. It would be probably too much to think of it in terms of Hobsbawm's 'labour aristocracy', but one should nonetheless point to increasing layering in comparison to lower-skilled and manual workers (for the exceptional status of white-collar employees in Central Europe see Wagner (1991) for Vienna, or Kocka (1981) for Germany), as well as growing opposition to 'capitalist' strata of the society traditionally dominated by Germans and Austrians.

This brings us to the next point, that government's measures in wealth distribution could be, among other issues, related to the burning national question in the country. Namely, this was a period when the Czech bourgeoisie attained the political power and became the dominant social force in the life of the First Republic.[45] Finally liberated from the Austrian-German dominance, new leaders and the circles surrounding them perceived economic independence as the critical ingredient in guaranteeing political sovereignty (Boyer 2000). And it is "the economic dimension of the national question has been little examined" (Patek et al. 2000). It should be noted that the social question in the Historic Lands had traditionally presumed ethnic connotation, such as "identification of capital with the Germans and labour with the Czechs" (Wiskemann 1938, p. 111, Urban 1998, p. 202). Similarly, the landowning aristocracy was always seen as foreign element (Austrian and German; or Hungarian in Slovakia), standing in stark contrast to

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[43] For example, average wage was nine times higher in 1928 in comparison to 1913 (Teichova 1988).

[44] Note that at the same time in Germany, the finance minister Köhler raised public servants wages (Voth 1993, p. 281), which has been also seen as one potential reason for the sluggish Weimar growth. It has been claimed, in the context of the so-called "Borchardt controversy", that the rise in wages outstripped productivity, and caused the fall in profit share and investment activity.

[45] It should be added here that this primarily meant Czech economic elites since the Czech Lands were far more economically advanced.

smallholding - and frequently debt-ridden - Czech farmers. Similarly in Slovakia, the relations with Hungarian minority resembled the Czech-German conflict.

The Land reform of 1919/20 was among the first big moves of the new government. Initiated under the slogan of 'undo the White Mountain' (Majerova 2000), it contained an overt ethnic dimension. The central issue was huge inequality in land ownership, which was predominantly in the hands of foreign (non-Czech) nobility such as Schwarzenbergs, Lobkowitzs, Wallensteins, Liechtensteins, Clam-Gallas, Kinskys, etc. (Tables A5 and A6 indicate that almost all large landowners were of non-Czech origin). The numbers are quite indicative of the gravity of the problem (see Table 1). In addition, dissatisfaction among peasants had reached an alarming level after the war. Peasant parties, armed with agrarian ideology that was calling for land redistribution, were flourishing all over Central and Eastern Europe (Teichova 1988). However, the problem of the peasant overpopulation was less acute in Czechoslovakia[46] than in other Eastern European countries since most of the rural 'surplus' had already been absorbed by industry  (Berend 1985, pp. 158-9). Consequently, the actual implementation of the reform was much slower than in other countries, and gained momentum of practical importance only in the 1930s.[47] Moreover, from the efficiency viewpoint, it was, by many accounts, regarded as a success[48], because it further contributed to the implementation of the modern, commercial agriculture in the country, especially in the medium sized holdings (Patek 2000; Teichova 1988, pp. 29-31).

The next setting for *Volksstumskampf* (ethnic struggle) was in the industry and in the banking. While tensions boiling in the agriculture, the situation was even tenser in industry, where the stakes were higher. Immediately after the War, as pointed out by Teichova (1974, p. 97) "a violent competitive struggle developed between the Czech bourgeoisie, who had taken over the Czechoslovak government, and the politically weakened German and Austrian bourgeoisie, who still held key positions in industry and banking in the newly established state". From the very

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[46] That is, in the industrially developed Czech Lands, but it was more urgent in Slovakia where the number of landless peasants was substantial.

[47] According to the reform, the State could expropriate above 150 ha for agricultural estates and above 250 ha for any estate (Agnew 2004). This was a first big blow affecting wealth distribution. Nevertheless, the reform was carried out reasonably peacefully, and in the end the extent of redistribution in the initial phase should not be overstated and large landowners were able to keep a considerable part of their estates (at least until 1930s, see below), especially as the implementation itself was prolonged (Majerova 2000).

[48] Crampton (2007, p. 63) comments that "Masaryk called the land reform 'the greatest act of the the new republic'"

beginning of the Republic's existence the Czech governing circles took measures that were aimed at diminishing the German and Austrian economic dominance.

The most important policy pursued in this direction was the so-called 'nostrification'. During peace negotiations after the WWI, the alternatives of expropriating the losing side were considered, mainly to curb economic foundations of Germany's '*Drang nach Osten*'. Among the resolutions of the peace treaties, an option was granted to countries in Central and South-Eastern Europe that had fought on the victorious side to buy (rather than socialize) the property of defeated countries within their territory. This affected in particular the property of German, Austrian and Hungarian citizens[49] (Teichova 1988b, p. 905). This possibility was most ardently pursued in Czechoslovakia,[50] being swiftly adopted to materialize rights from the treaties when the situation in defeated countries was far from enviable. The Nostrification Act, coupled with the newly introduced Currency reform and Banking laws, made it increasingly difficult for German and Austrian owners to finance their subsidiaries in the Republic (Rašin 1923, Teichova 1974). In a period when the hyperinflation was ravaging in Weimar Germany, Austria, and Hungary, the relatively strong Czechoslovak currency implied favourable buying conditions for the Czech bourgeoisie (Teichova 1988b, p.905).[51]

## 5.2. The Great Depression

Economic crises impact critically every aspect of inflicted countries, not rarely resulting in unpredictable events that stretch far beyond the strictly economic sphere and whose impact could endure through several decades. This is especially evident in the case of interwar Czechoslovakia where the world crisis was, beyond doubt, partly responsible for the watershed

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[49] Teichova (1988b, p. 905) notes: "article 297 of the Versailles peace treaty concerning the property of German nationals, by article 249 of treaty of St Germain and by article 232 of the Trianon treaty with regard to Austrian and Hungarian nationals respectively".

[50] The Czechoslovak government passed the Nostrification Act in 1919, which required all companies operating in Czechoslovakia to be also registered there (previously, as discussed, most of the companies had their head office in Vienna). In addition, it was required that at least half of the management board members were Czechoslovak citizens.

[51] The distributional effects of 'nostrification' are difficult to assess, as it mostly affected owners in Austria (notably in Vienna) and Germany. The Czech capital in Živnostenská banka (Živnobanka), headed by Jaroslav Preiss, was dominant force behind the process. Equally, it led in significant part to simply changing stakes between Entente and Central powers, since in most cases the Czech capital showed to be insufficient for large take-overs, so it was at least intended that it assumes the role of a junior partner to the Entente capital. This was usually conducted under the auspices of the top political figures and it corresponded to the changed political reality after the WW1. Beneš was particularly active in bringing French and British capital into the industries formerly controlled by Germans and Austrians (Teichova 2008, pp. 195-7). The case of the industrial giant Škoda-Works is revealing in this respect with bringing French Schneider-Creusot (where top Czech political figures had frequently been board members).

events in the country's history, from initiating large social and ethnic tensions, political extremism, the eventual German occupation and the unprecedented institutional change of the introduction of communism. And quite naturally, the economic crises of the historical proportion as the Great Depression might have affected distributional patterns in a decisive manner. Indeed, a research on top incomes has found that big exogenous shocks of this type were the main cause of a large drop of top income shares in the interwar period, and particularly, it was the concentrated 'capitalist' top of the distribution that was most severely hurt by the Great Depression through stock-market crushes, (hyper)inflation, contraction in international trade etc.

Czechoslovak top incomes in the interwar period were on the level of the industrialised western countries. Even the subsequent decline in the early 1930s corresponds to western experience. We saw in that large changes experienced by the top 0.1 per cent were the main factor affecting the development of the top percentile shares (Figure 2). During the Great Depression shares of the top 0.1 per cent strongly fell, while 'lower' top groups proved more resistant to the crisis (Figure 11). Figure 12 depicts the evolution of the real mean income for various groups of the population in the period from 1927 to 1936. It can be seen that the income of the top 0.1 experienced a strong decline from the outset of the crisis in 1929, substantially 'outpacing' the fall in average income of the total population, as well as that of the lower top percentile's group (top 1-0.5 per cent). Consequently, we observe a sharp decline in the share of the top 0.1 per cent in the total income. In the same manner, one can understand an increase in lower top income groups (especially a bounce in the average income of the top 5-1 per cent group) which did not experience a deterioration in their real income until 1932, and smaller proportional decline with respect to average income until 1934. However, this development was reversed from the middle of the decade when the top 0.1 bounced back more strongly than the average income, while the corresponding rise did not occur for the lower top income groups.
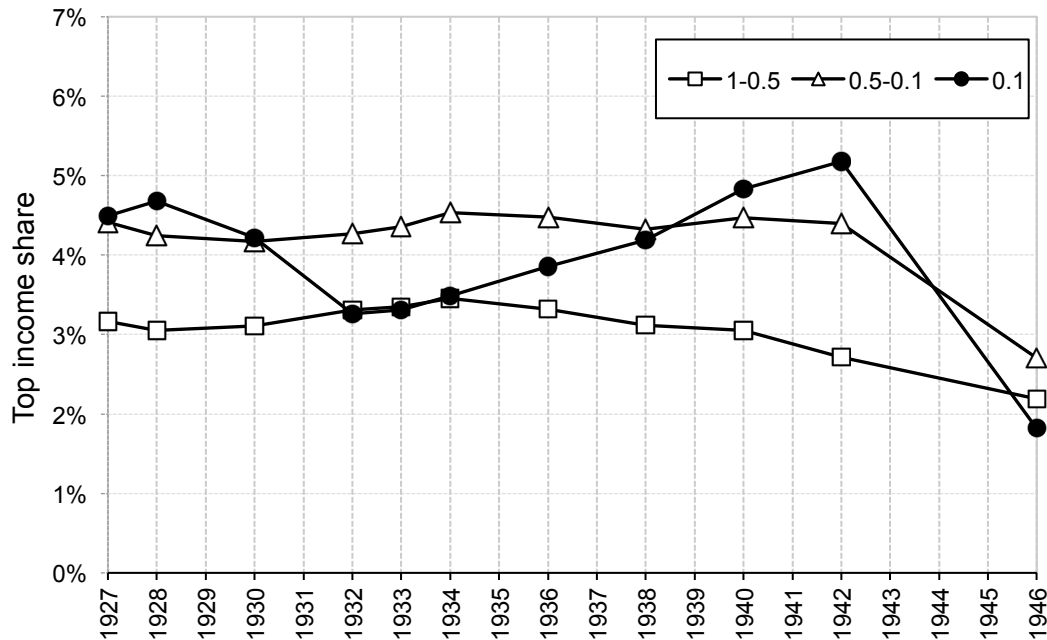
Figure 11: Top percentile in Czechoslovakia, 1927-1946
Source: Author's computation based on the income tax data
Note: 1940 and 1942 refers to the Protectorate of Bohemia and Moravia
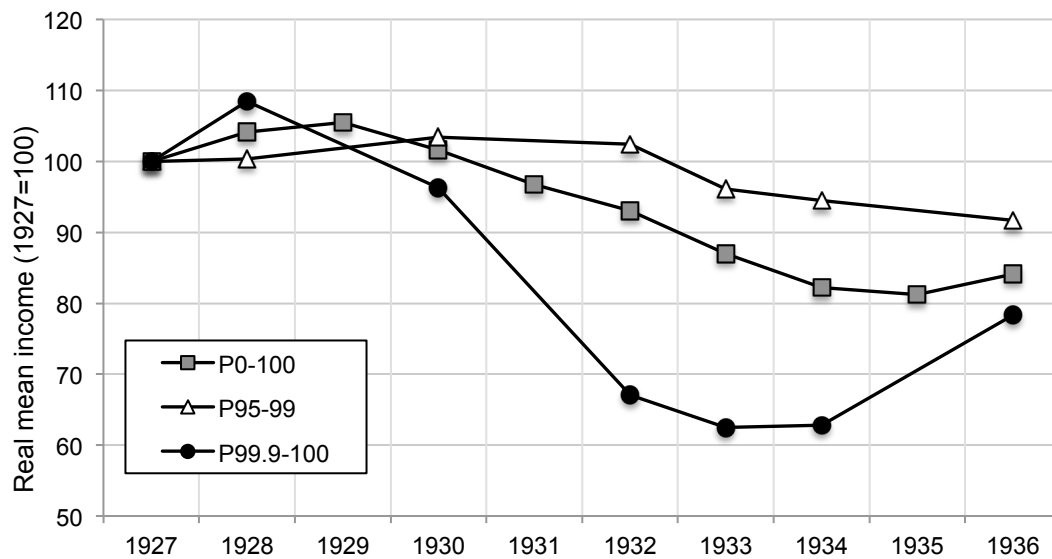


Figure 12: Average real income during the Depression, Czechoslovakia 1927-1936
Source: author's computation based on income tax data
Note: the real series were derived using the cost of living index

In order to understand described evolution, it is essential to have an insight into the income decomposition of the different top income groups. In Figure 13 we point to various income sources of the top 0.1 per cent and 'bottom' constituent group of the top percentile, the top 1-0.5

per cent. The presented structure clearly shows that 'unearned', or broadly defined capital income, accounted for the bulk of the top 0.1 per cent income, but also experienced the largest fall in the Depression.[52] The 'labour income', on the other hand, showed substantial 'stickiness' in the same period, and, as can be seen from Figure 13, accounted (more than any other source of income) for the observed stability in the 1–0.5% series. As we proceed further down the income distribution, especially below the top percentile, the labour income becomes more important.



Figure 13: Income composition of the top 0.1 per cent and 1-0.5 per cent in Czechoslovakia
Source: author's computation based on income tax statistics

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[52] Covered years indicate availability of detailed statistics.

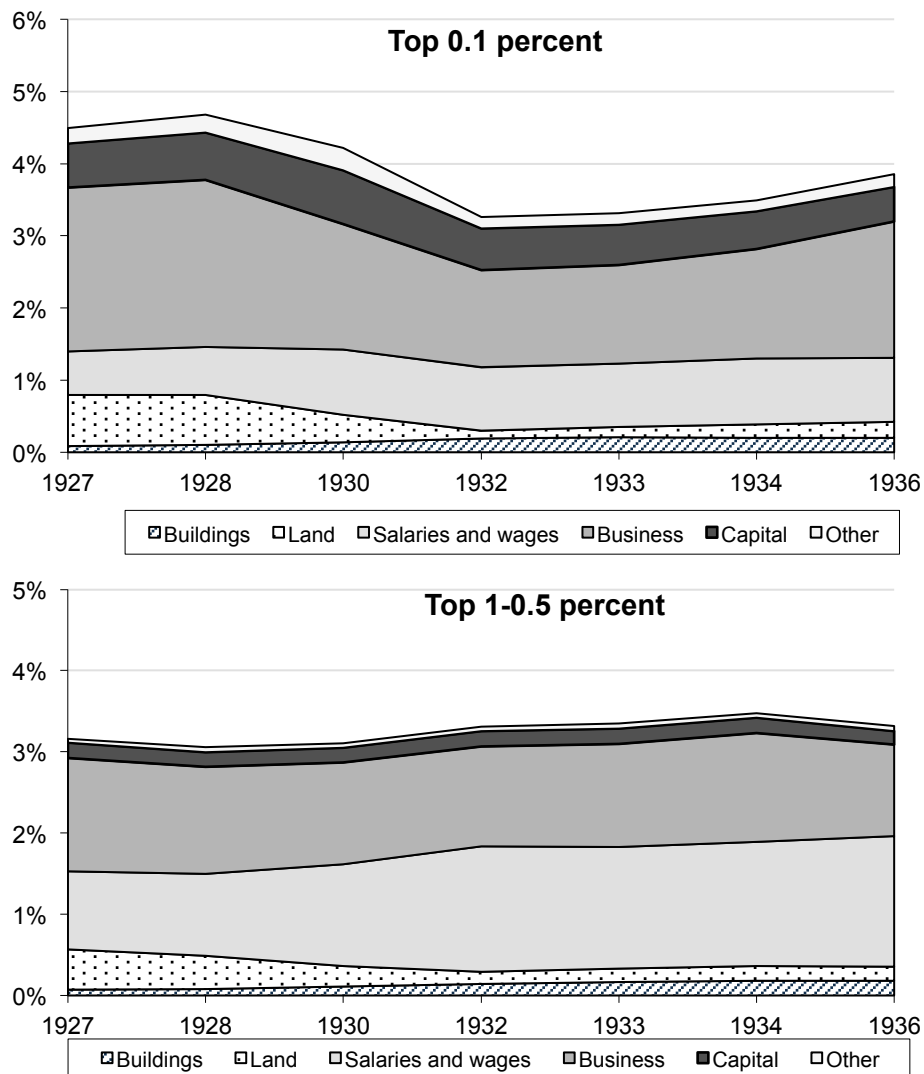Figures 14a and 14b present detailed income composition for various top groups in 1927 and 1932, that is, before the start of the Great Depression and right in the midst of it. As said, it can be noticed that the importance of labour income is negatively related with the income rank. Thus, wage income makes the predominant income source for the top 5-1 per cent group in 1927, and falls steadily for higher fractiles, to become practically irrelevant for the very top groups such as the top 0.01 per cent and above. However, only few years later, with the arrival of the crisis, the relative position of labour income at the top becomes noticeably more prominent (Figure 14b).

It may be argued that it was primarily due to a severe deflation that dominantly wage-composed top income groups were made better off relative to the very top. Wage rigidity did not lead to a downward adjustment of their income (Figure 12) relative to other income sources. Let us remember that Czechoslovakia succumbed to the 'gold orthodoxy' and adhered relatively longer to the French-led Gold bloc, while it managed to free itself from the consequent deflation by fairly late devaluations in 1934 and 1936 (Eichengreen 1992). Exactly the same development of top incomes is observed in other countries, such as France (Piketty 2003) or Germany (Dell 2007), where shares of lower groups within the top decile, dominated by labour income, such as P90-95 and P95-99, experienced a strong growth during the Depression.

Similarly, Figures 14a and 14b reveal that other types of income that traditionally benefit from deflation fared relatively better during the crisis. Rental income (including owner-occupier imputed rents) thus gained in importance in 1932 relative to 1927. One could similarly argue that fixed-income portion of capital income[53] made this source relatively more resilient.

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[53] The tax law designated primarily dividends and interests as 'income from capital' (Novotny 1938, p. 70).
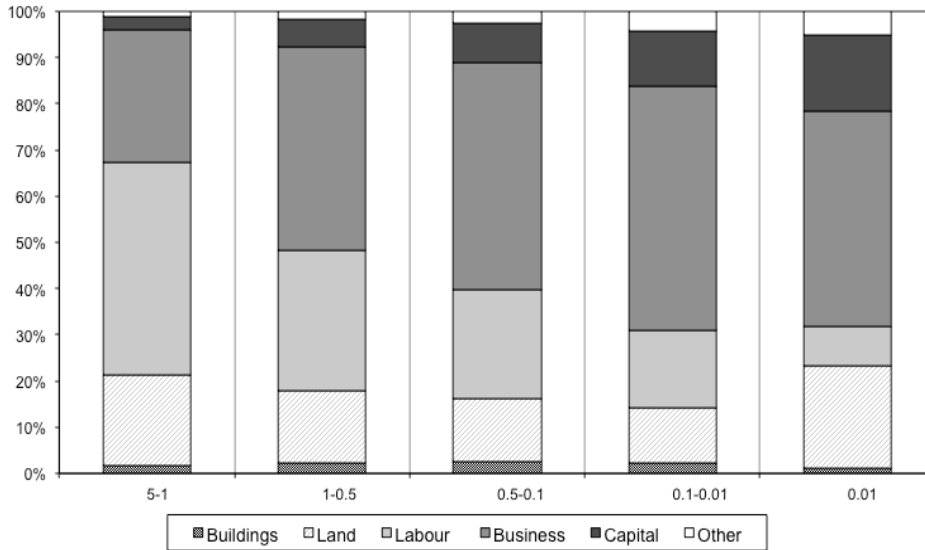
Figure 14a: The decomposition of the top 5 per cent by income source, ČSR 1927
Source: own computation based on income tax statistics
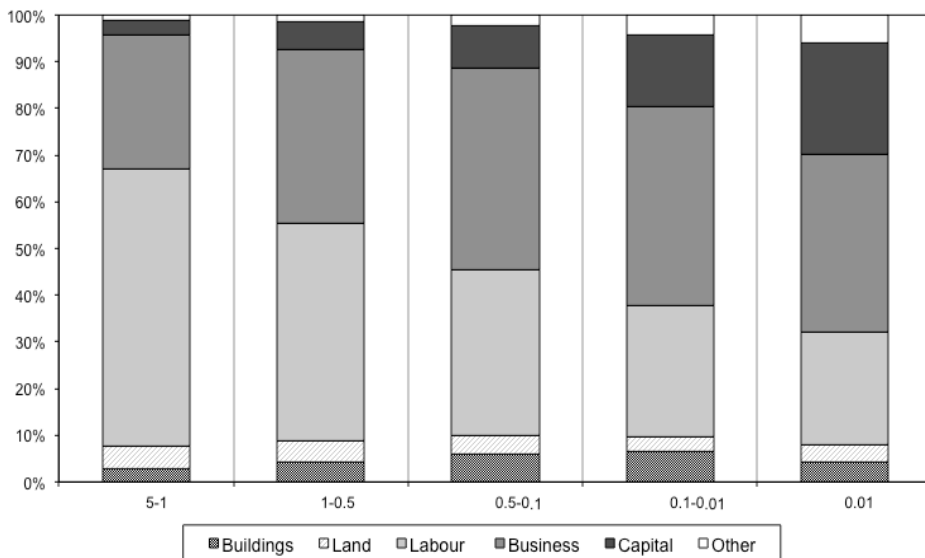


Figure 14b: The decomposition of the top 5 per cent by income source, ČSR 1932
Source: own computation based on income tax statistics

On the other hand, business profits were exceedingly hurt by the crisis.[54] First, let us point to the 'industrial character' of the top incomes in interwar Czechoslovakia (since business income had been the most important income source of top shares), which is revealed from the

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[54] The unincorporated businesses form was characteristic for Central Europe (see Dell 2007 for Germany) (up to present day; see chapter 2).

decomposition of the business income in top groups according to economic branches (Figure 15).
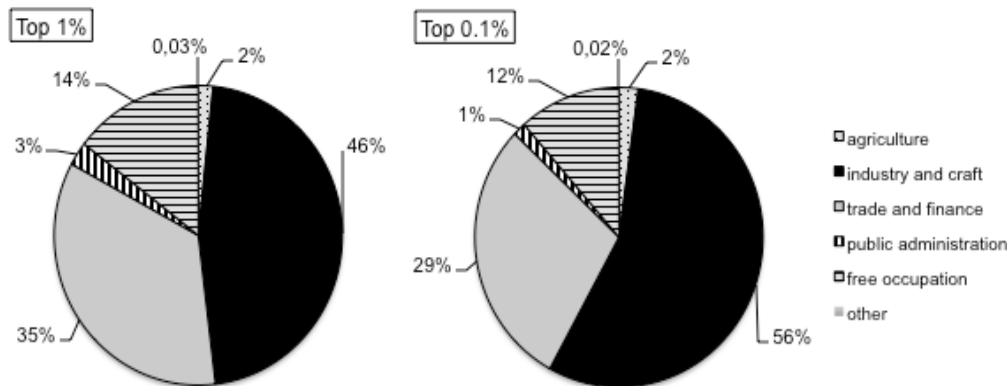


Figure 15: 'Business and self-employment' income of the top 1% and the top 0.1% according to economic branch in 1930
Source: author's computation based on income tax statistics

To understand the effect of the crisis on business profits, it should be noted that in Czechoslovakia a large part of capital was tied to export-orientated industries, which consequently suffered most from the contraction in international trade. As mentioned already, the Czech industrial potential, inherited from the Habsburg period, outsized the domestic market of the First Republic, making the country exceedingly dependent on export. However, it seems that Czechoslovakia had less painfully adapted to the dissolution of the protected market of Austria-Hungary than to the contraction in global trade in the 1930s. Figure 16 shows the development of exports between 1926 and 1936. It can be seen that exports literally more than halved until 1933. The path of exports indicates remarkable positive correlation to the very top shares - such as the top 0.1 per cent - from the outset of the crisis. Figure 13 shows that the recovery of the top 0.1 per cent was exclusively driven by the rising business profits.
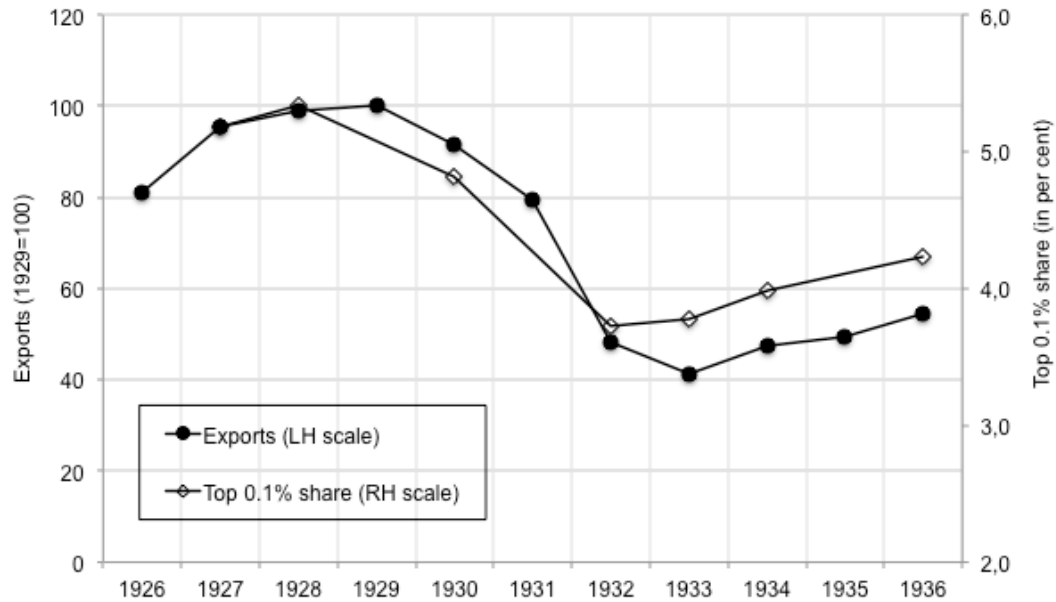
Figure 16: Export (of commodities) index
Source: exports: Teichova (1988); top shares: author's computation based on income tax statistics

The most disastrous effect was felt in consumer goods industries concentrated in the regions with the German majority (Teichova 1988, p. 61), which were moreover traditionally exported-oriented. 'Sudetenland' (*Sudety*) was industrially the most advanced part of the Czech Lands, primarily specialized in export-orientated industries, and was in consequence the region that suffered most during the crisis. This further alienated the Germans from the Czechs because they believed that the Czechoslovak state and the 'Czech banks' were not doing enough to help them (Wiskemann 1938). Local 'German banks' such as Böhmische Escompte-Bank and the Böhmische Union Bank had to be saved due to reckless lending to industry and, more importantly, due to the financial crises that hit Austria and Germany in 1931 when all deposits were blocked (Wiskemann 1938, p. 166)

Map 1 compares incomes of taxpayers that declared income above 100.000 Kč in 1930 and 1932.[55] People with annual income above this threshold occupied the top of income distribution, roughly the top 0.1 per cent. It is plausible to conclude from the map that shocks to 'industrial capital' accounted for most of the decline in income in 1932, as well as that German-speaking

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[55] We take only towns with more than 70 taxpayers because this level included the predominant part of income. From Slovakia, only Bratislava and Košice satisfy this requirement, but they did not experience a significant decline of income.

regions (indicated by the black area) were hit disproportionately harder by the Depression than the rest of the country. Particularly strong concentration of top incomes was recorded in the industrial north-western area, in the birthplace of industrialization of the Historic lands, around Liberec and Usti nad Labem. This region experienced the strongest fall in income in 1931, along with the area around Ostrava, renowned for its heavy industry, and the world famous tourist destinations in the west. Furthermore, we should probably also add the effect of 1931 financial crisis in Austria and Germany, where Sudeten Germans traditionally invested their capital (Wiskeman 1938). The depression-ridden economic situation resulted in growing nationalism that pushed Sudeten Germans to political alignment with Nazi Germany (Teichova 1988, p. 61), which presented the first step in the eventual dismemberment of Czechoslovakia. Deflation, brought about by 'gold orthodoxy', had as well more negative impact on (industrial) capital income than on less flexible labour income which could have made significant part in the big administrative and financial centres, most notably in Prague and Brno.
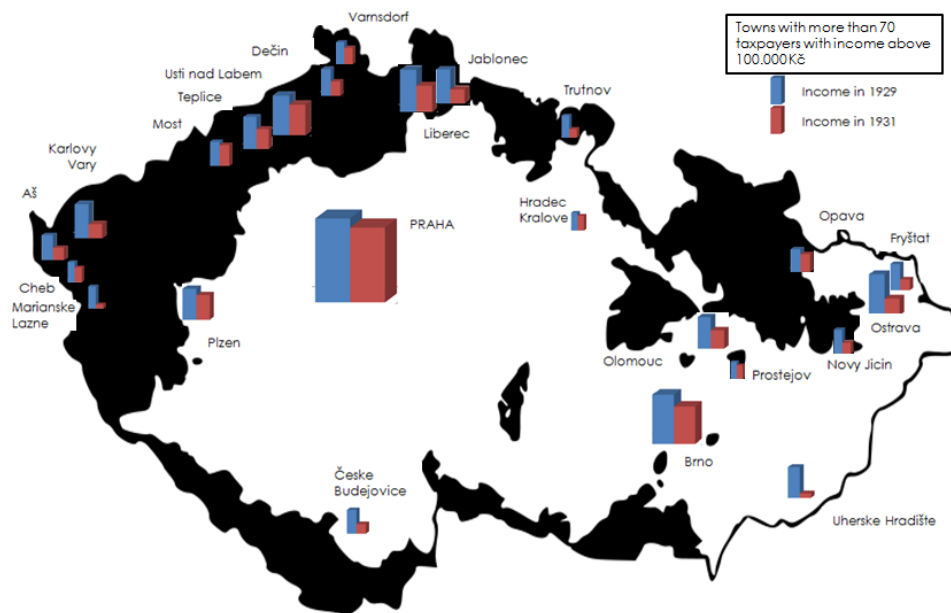


Map 1: The Great Depression and 'Die Sudetenfrage'
Notes: Black areas indicate German-speaking majority
Source: Author's computation based on income tax statistics

Finally, one notices in Figure 14a an important proportion of land incomes among the top income groups in 1927. However, one should not be surprised at this,[56] since it was already pointed to the specific 'industrial-agrarian' character of the Czechoslovak economy. As discussed in some detail above, most big landowners had been engaged in commercial agriculture, for example in sugar beet and hop cultivation, which has traditionally been a backbone of the intensive farming in the Czech Lands. Moreover, these branches were almost as important to country's economy and export potential as its strong industry.[57] Large landholders made still an important economic factor in the country in the late 1920s.[58] One should also add that mid-1920s were especially beneficial to agriculture due to rising global agricultural prices and the introduction of tariffs in 1926 (Berend 1985, p. 163; Drabek 1985, p. 412). The land reform itself signified only the final move towards commercial agriculture and, as indicated by Teichova (1988), it resulted that "the last traces of feudalism vanished and the agricultural bourgeoisie was strengthened. Thus, favourable conditions were created for structural change in agriculture".

But Figure 14b suggests in addition that, besides a fall of business profits experienced by the top groups, the Great Depression proved especially devastating for the Czechoslovak agriculture, delivering consequently an extremely hard blow to land income component of top groups in the early 1930s. It can be seen from Figure 13 how, in accordance with historical accounts, the crisis was firstly felt in agriculture (Lacina 1974), already in 1930 (for example, due to the world crisis on the sugar market which started already in 1928). One can clearly discern the crisis-induced fall in importance of land income for all top income groups.[59] It seems thus plausible to ascribe a detrimental effect of deflation on top land incomes (in contrast to rental income from real-estate or fixed-income instruments) to the commercial (rather than rentier) orientation of big landlords. In a similar manner, we saw that the WWI inflation and soaring food prices caused top land incomes to surge during the war.[60]

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[56] Thus, when Piketty (2007, p. 51) notes as an interesting fact that capital owners at the beginning of the twentieth century in France were very rarely landlords, it could be similarly acknowledged the opposite to be true in the First Republic.

[57] In interwar Czechoslovakia arable land accounted for a substantial part of the total country's area (around 43 per cent of its total surface in 1928 (see Aperçu statistique 1930, p.65, Tab. 1)) in comparison to western countries (Teichova 1988).

[58] As a political group they were mostly gathered around the conservative wing of the Agricultural party under Karel Prášek, which stood in opposition to a more moderate wing of the party's leader, Antonín Švehla (Miller 1999).

[59] The provided decomposition for Czechoslovakia in Figure 13a and 13b corresponds closely to that found in the Czech Lands, in particular in Bohemia which made around two-thirds of top incomes (Moravia and Silesia accounted for 22 per cent, Slovakia for 12 per cent, while Subcarpathian Rus for less than 1 per cent).

[60] Land income, as defined in the tax law, was determined for the sale of agricultural products and for smaller farmers (that do not keep books) was based on the cadastral net yield assessments. We could not find any evidencethat the

As Figure 17 below indicates, there was a rise in wage inequality, which was due to the fact that white-collar workers saw relatively smaller fall than was the case for the blue-collar employees (that kept their job). This is why we see that wage inequality of those still employed workers rose. On the other hand, this contrast markedly sharpens with huge rise in unemployment (workers have now zero incomes). For example, the share of blue-collar workers with employment in 1934 was barely 25% (Teichova 1988).
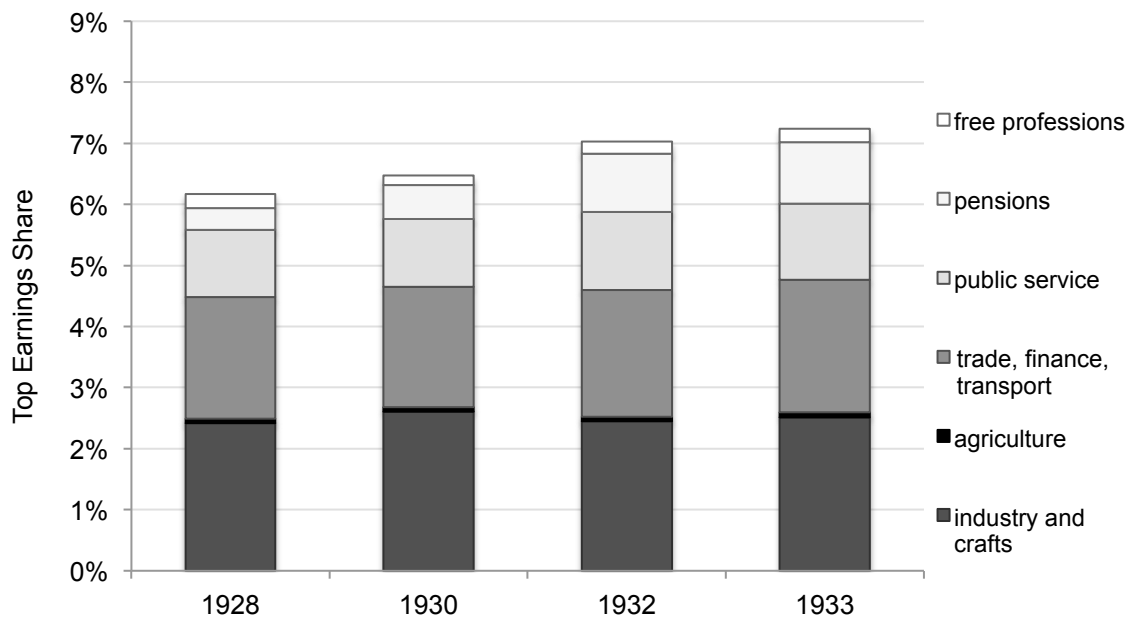


Figure 17: Top 1 per cent of earnings distribution
Source: author's computation from the income tax statistics

## 5.3. State, cartelisation and occupation

The recovery from the Great Depression proved to be especially painful and prolonged. The rigid adherence to the gold standard (in the so-called Gold bloc centred around its closest ally, France) severely undermined country's international competitiveness, and Czechoslovakia only managed to free itself from the consequent deflation by late devaluations in 1934 and 1936. But this alone, even though it stimulated exports initially, proved to be insufficient to result in the

observed fall could have been a result of changes in income tax legislation (for instance, intended as a help to the agriculture during the crisis).

strong recovery. The more so as the government still insisted on conservative fiscal and monetary policies (e.g., Eichengreen 1992, p. 365, Pryor 1979).

Real incomes started to recover only in 1936, lagging thus behind the most of European countries. However, we saw that the recovery of the top 0.1 per cent had been much more formidable than for the rest (Figure 12). Figure 13 further shows that this was due to the rise in business profits. One should partly attribute this to the moderate recovery in exports (Figure 16). Especially the armament boom in the late 1930s stimulated the country's wounded industry, as Czechoslovakia had been one of the largest world armament producers at the time (Hauner 1986). Government expenditure on defence increased strongly amid growing militancy and clear signs of hostility from Hitler's Germany. Thus, while spending on defence made 15% of the total government expenditure in 1925, it accounted for as much as 30% in 1936 and 40% in 1938 (Teichova 1988).

But above all, the re-concentration of the very top income shares in the years immediately preceding Munich needs to be understood in the light of the increasing state intervention into the economic sphere, most notably, through the intense cartelisation of the whole economy (Teichova 1974). In the country that had already been characterized by one of the most concentrated industrial structures, with clear monopolistic features (especially in producer-goods industries) (Hexner 1933), this development led to rising concentration at the very top, as evidenced in the recovery of the top 0.1 per cent (Figure 2). Notwithstanding the fact that Czechoslovak industry had shown a certain level of cartelisation before, only after the introduction of compulsory cartelisation in 1933 it became the dominant feature of the whole economy.[61] This legislation provided the basis for concentration and monopolistic behaviour, since it was only necessary that the largest producer in the specific industry ask for the official cartelisation (Teichova 1988; p. 44; Prucha et al. 2004, pp. 281-5).[62]

Following this reasoning, we should attribute a decline in shares of all top groups below the top 0.1 per cent  (Figure 1 and 2) to the concentration tendencies related to the more state-regulated and cartelised economy. Figures 1 show that shares of lower top groups, such as the top 5-1 per

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[61] It was intended as the anti-crisis measure, in order to check unbridled competition that had caused deflation and overproduction. Similar legislation measures were implemented worldwide, such as the National Industrial Recovery Act (NIRA) of 1933 in the US.

[62] Teichova (1988, p. 44) explains further that "outsiders were no longer allowed to produce these goods and entry into the cartelised industry was impossible without special official permission".

cent, started to fall from 1934. This was, as we saw, a group dominantly composed of wages earners and it may be argued that wages were held in check by cartels, whose sole *raison d'être* is to safeguard profits (thus they are more likely to be formed during slumps; Kalecki 1938, p. 111). In the same manner, smaller businesses outside the cartelised sector did not benefit from the prevailing 'corporatism' (e.g. see Phelps 2013). The fall of the top 5-1 per cent from 1932 to 1936 was caused in the same proportion by the fall in wages and businesses profits.[63] On the other hand, Figure 18 shows that the recovery of the top 0.1 per cent was driven by the rise in business profits, clearly pointing to the redistribution of business profits at the expanse of smaller businesses.[64]

The trend of increased layering of the top percentile continued with the German occupation, when the Protectorate of Bohemia and Moravia became an integral part of the Third Reich's war economy. By 1942, in the heyday of Heydrich's terror rule, the top 0.1 per cent surpassed its pre-depression levels. The Protectorate, with its industrial capacity, was exclusively in the service of the German war effort and the link between the political authority and economy became stronger than ever. The region of Bohemia and Moravia was of crucial interest for the German war industry, and contributed to 9-12 per cent of the total German industrial production during the war years (Teichova 1988, p. 84). There was a strong increase in the industrial concentration during the German occupation (see Olšovsky et al. 1963, pp. 537-550).

In Germany the top percentile experienced a sudden upswing following the Nazi conquest of power. Dell (2007, pp. 374-75) attributes this to the closer relationship of the industry and the regime due to growing war preparations (Spoerer 1996; Sweezey 1941).[65] It can be similarly surmised that in the Protectorate the importance of limited number of big businesses – quite likely represented by 0.1 per cent group and above – rose relative to the lower top income groups (Fig. 2). There is rich historical evidence pointing to a marked enrichment of the particular layers of society, in the first place of large industrialists who collaborated with the Nazi regime (Kral 1959). In addition, the wartime often offers various means for rapid and spectacular enrichment, and in this respect we should mention the infamous process of 'Ariyanization' through which Jewish property was confiscated and dominantly transferred into the German

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[63] Note the timing of cartelization – in 1933 and 1934 there is moderate improvement of the bottom groups of the top percentile (of business incomes, probably due to economic recovery), but afterwards there is fall of these of groups (especially business incomes)

[64] In this respect, we could say that Kalecki (1971) was wrong, since the increase of the so-called 'degree of monopoly' did not lead to a rise in the aggregate capital share (Stadnik 1946; Krejči 1972).

[65] But Kalecki (1943) was obviously right when stating  "The fascist system starts from the overcoming of unemployment, develops into an armament economy of scarcity, and ends inevitably in war".

hands (Table 2) (Junz 2002).[66] Teichova (1998, p. 286) states that it caused a "scramble for the spoils among business circles of Sudeten Germans and Reich Germans as well as among state and private enterprises". However, this implied that the effect of this policies on the private income and wealth concentration was less marked in the Protectorate than in the Reich, since in the former it disproportionally benefited the German state and the German residents,[67] as documented by the spectacular rise of the German net foreign assets in the Protectorate (Teichova 1998) (see below).

Figure 18 shows that the rise in top concentration by 1940 was induced by the rise of business profits. One observes in addition a modest recovery of land income, while the contribution of other income sources fell. Inflation was conceivably beneficial to the recovery of land incomes, while its effect on the rise of business income was of secondary importance as the differing experience of business profits among top groups suggests that the rising inequality at the top was more important.[68] Equally, higher inflation adversely affected capital income (Prucha et al. 2004, p. 444) (especially fixed interest securities; which correspondingly benefited from the deflation during the Great Depression), but the fall could also partly stem from growing ownership transfers of largest corporations to the German (state) enterprises (e.g. Reichswerke Hermann Göring, Dresdner bank etc.), as well as due to the flight of the Czech capital (Prucha et al. 2004, p. 439)

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[66] The definition of 'Jewish enterprise' was quite broad (such as that one Jewish board member was enough for a company to be qualified as 'Jewish'), and accordingly allowed wide scope for confiscation (Teichova 1998, pp. 289-90)

[67] These 'state enterprises' immediately bring to mind the industrial giant 'Reichswerke Hermann Göring' (Overy 1983) or big German banks such as Dresdner Bank and Deutsche Bank.

[68] Inflation would have presumably benefited business incomes for all top income groups.
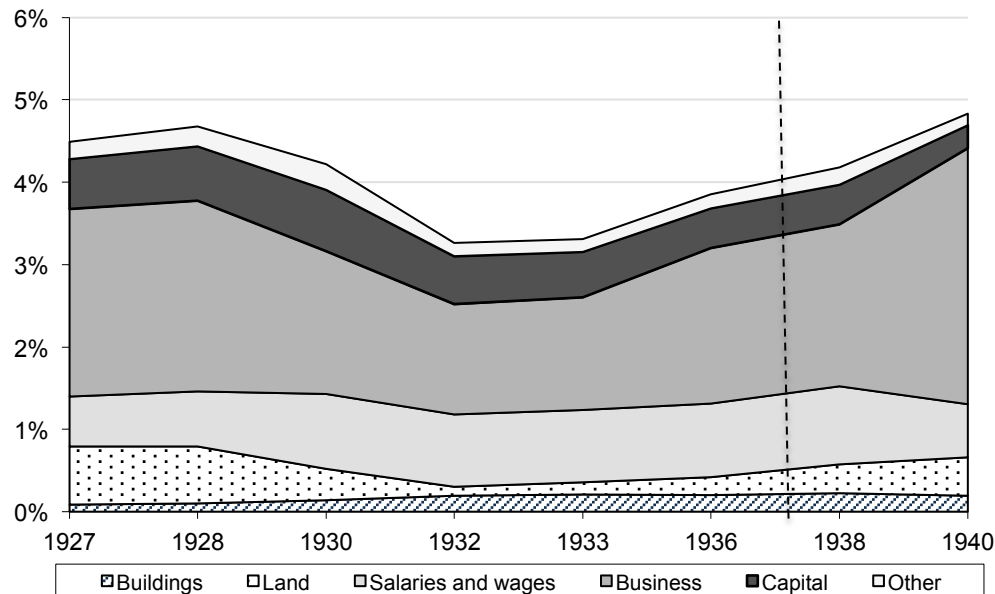
Figure 18: Top 0.1 per cent in Czech Lands 1927-1936, and Protectorate of Bohemia 1938-1940
Note: vertical intermittent line indicates that series that series refer to the Protectorate after 1938

On the other hand, there was a decline in shares of lower top income groups that were dominantly composed of wages, in particular of the top 5-1 per cent (Figure 1). Equally, note that a fall in the 'bottom' constituent part of the top percentile, which derived a larger part of income from employment, was more marked than that of the intermediate 0.5-0.1 per cent. Once again, it is useful to draw a parallel to Germany. Dell (2007) similarly finds a significant reduction in shares of top groups below the top percentile. The Nazis, as later would the communists, subdued consumption to accumulation considerations (primarily in war industries) through wage ceilings and the narrowing of the wage differential. Conceivably, the high-paid workers had to bear proportionally the larger burden of these policies.

In general, the wage equalization occurred in the Czech Lands from the mid-1930s (Teichova 1988)[69] and assumedly continued under the German occupation. Večernik (1996, p. 213) thus points out that "during the World-War II period, the Germans introduced a policy which was directly aimed at equalisation. On the one hand, they preferred to reward manufacturing workers for producing for the German war machine. On the other hand, they simultaneously supressed Czech intellectuals in order to break the spiritual basis of the nation intended to be Germanised. Intellectuals were considered more hostile to the Nazi occupation and less acceptable for planned assimilation."

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[69] Also quoted in Atkinson 2008, p. 176.

| | Description of assets | Value in K | % of nat.income |
|---|---|---|---|
| 1. | Value of bank accounts | 2.063.534.076 | 3,6% |
| 2. | Value of confiscated enterprises | 1.603.238.112 | 2,8% |
| 3. | Value of landed property | | |
| | a) building sites | 830.863.747 | 1,5% |
| | b) arable land | 413.084.000 | 0,7% |
| 4. | Confiscated cash and receipts from sale of immovable assets | 42.808.077 | 0,1% |
| 5. | Special possessions | 1.075.276.926 | 1,9% |
| | Total | 6.028.804.938 | 10,5% |

Table 2: The expropriated Jewish wealth in 1942
Source: Teichova 1998, Tab. 292; national income from Stadnik 1946 (net domestic product at factor costs)

## 5.4. Regional development: Slovakia in the First Republic

A regional development in interwar Czechoslovakia was unequally distributed. While the Czech Lands were at the economic level of western European countries, Slovakia (and Carpathian Ruthenia) was still predominantly agricultural in character. Indeed, one of the expounded rationales for the creation of the joint state were positive benefits that the union would have on the industrialization of Slovakia. Similarly, in the post-war ethnic tensions all over Central Europe, Czechs, who became the dominant political power in the Republic, saw a union with Slovaks as further strengthening their position against the local Germans (Krejči 1996). However, the idea of the single Czechoslovak nation promoted from Prague, often accompanied by centralist tendencies, was received with certain reservation among the Slovaks (Skalnik Leff 1988). Germans, on the other hand, as the economically most advanced (and previously politically dominant) ethnic group, felt to be trapped in a country. Strong competition ensued between Czechs and Germans (Boyer 2000). Traditionally, the ethnic conflict between Czechs and Germans had decisively impacted the economy of the Czech Lands and troubled the old Monarchy,[70] often bringing a political process to a standstill (for example, leading to the downfall of both Taaffe and Badeni).

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[70] For example, David Good (1978), finds all economic argument aiming to explain the depression in Imperial Austria at the turn of the century as unsatisfactory, and argues instead that the most likely reason was the 'Czech-German' national struggle (pp. 180-1).

Figure 19 reveals an evident disproportion in the regional distribution of top incomes. It can be seen that the Czech Lands (Bohemia, Moravia and Silesia) contributed to almost 90 per cent of the top percentile's occupiers, while Slovakia to barely 10 per cent.[71] This result is not surprising as the level of development was strongly biased in favour of the Czech Lands. Slovakia accounted for barely 9.2 per cent of all industrial establishments and 7.7 per cent of the country's employment (Prucha et al. 2004, Tab. 2.13). The real average wage in Bohemia was almost 20 per cent higher than in Slovakia at the eve of the great crisis (Teichova 1988). In all, the prospects for the Slovak industry worsened in comparison to the pre-war period in Austria-Hungary, where Slovakia accounted for the important part of the industry in Hungary and benefited from policies promoting industrialization. The laissez-faire policy advanced from Prague contributed to a constant lag of Slovak enterprises, which were no match to Czech or local German enterprises (Teichova 1988).

The composition of top income groups, presented for Czechoslovakia in Figures 14a and 14b closely corresponds to that found in the Czech Lands, due to the region's dominant contribution to top incomes.
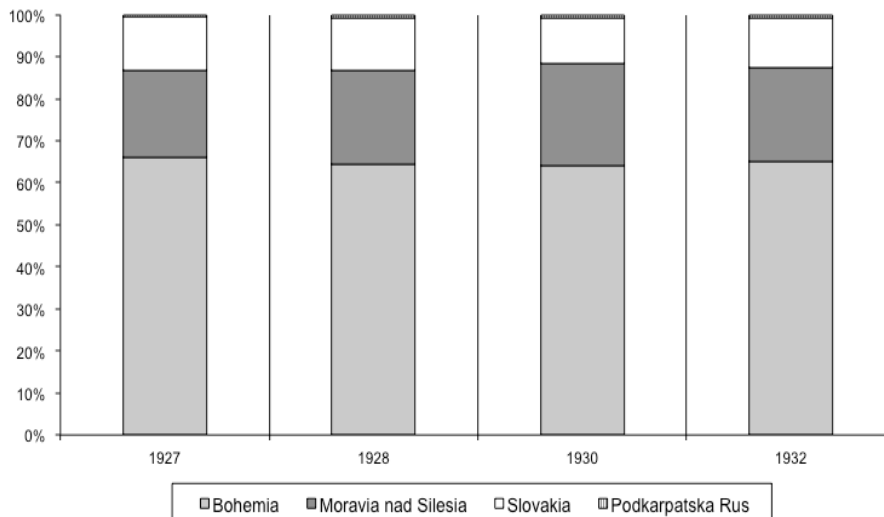


Figure 19: The composition of the top 1 per cent in Czechoslovakia by region
Source: author's computation based on the income tax statistics

The Slovak top income composition (Figures 20a and 20b) shows greater predominance of land income. Shocks to land income were therefore even more pronounced in Slovakia, then still the agricultural part of the country, where, accordingly, land accounted for the relatively more

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[71] Although Slovakia's share in the total population was almost 25 per cent.

important factor of production. In contrast to high land productivity characteristic for the Czech Lands, the Slovak agriculture was dominantly characterized by the extensive farming and low productivity. Land inequality during the Habsburg period was equally pronounced in Slovakia due to vast landholdings of the Hungarian nobility.[72] Correspondingly, Figures 20a and 20b point to the greater importance of land income for the top incomes groups in Slovakia, as well as the more substantial shock experienced in the Great Depression. Although markedly higher industrialization of the Czech Lands made the impact of the world agricultural crisis felt less adversely in Czechoslovakia than in other countries in Central and Eastern Europe, the crisis was especially pronounced in agricultural Slovakia.
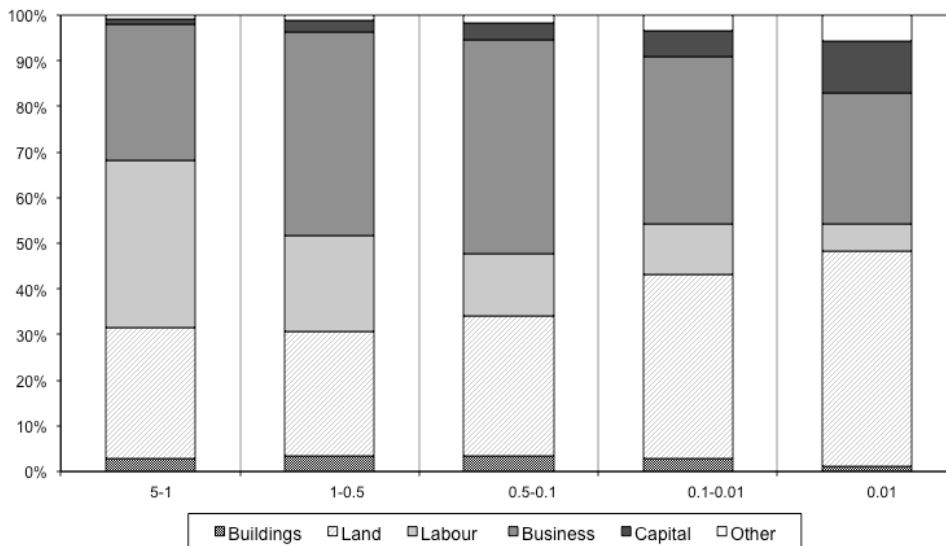


Figure 20a: The decomposition of the top 5 per cent by income source, Slovakia 1927
Source: own computation based on income tax statistics



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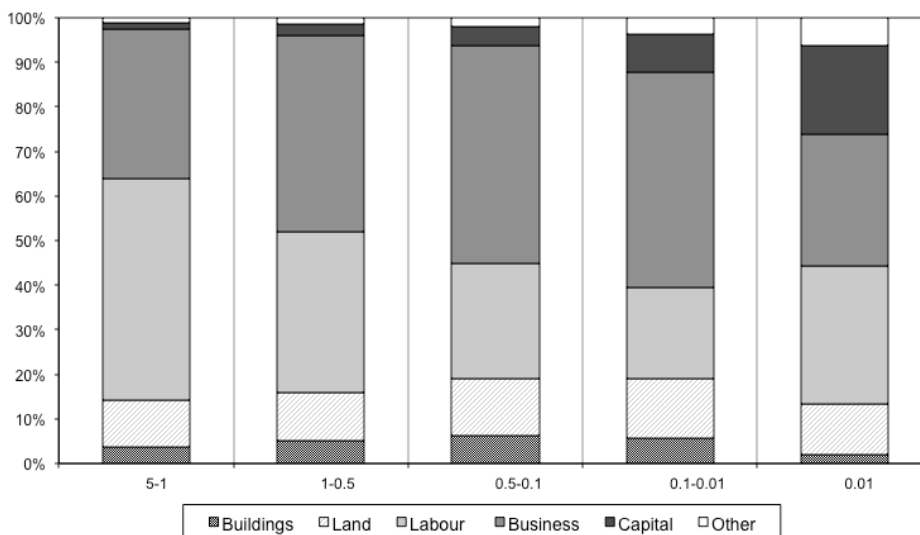
[72] For example, the Esterházys, the greatest landowning Hungarian noble family had vast holdings in Slovakia.

Figure 20b: The decomposition of the top 5 per cent by income source, Slovakia 1932
Source: author's computation based on income tax statistics

Figure 21 shows that during the Great Depression a proportionally larger drop in income shares was experienced by higher groups within the top percentile, primarily due to the stumbling of top land incomes which made the largest part of their income prior to crisis (Figures 20a and 20b). As already noted, central European countries saw a plunge in exports of agricultural products, which generally fell by more than 50 per cent of its pre-crisis level, in the first place due to falling agricultural prices. In addition, the 'price scissors' aggravated further the Slovak position in Czechoslovakia (Berend 1998), as prices of agricultural products fell more strongly than of industrial products, which deepened the rift between Czechs and Slovaks.[73]
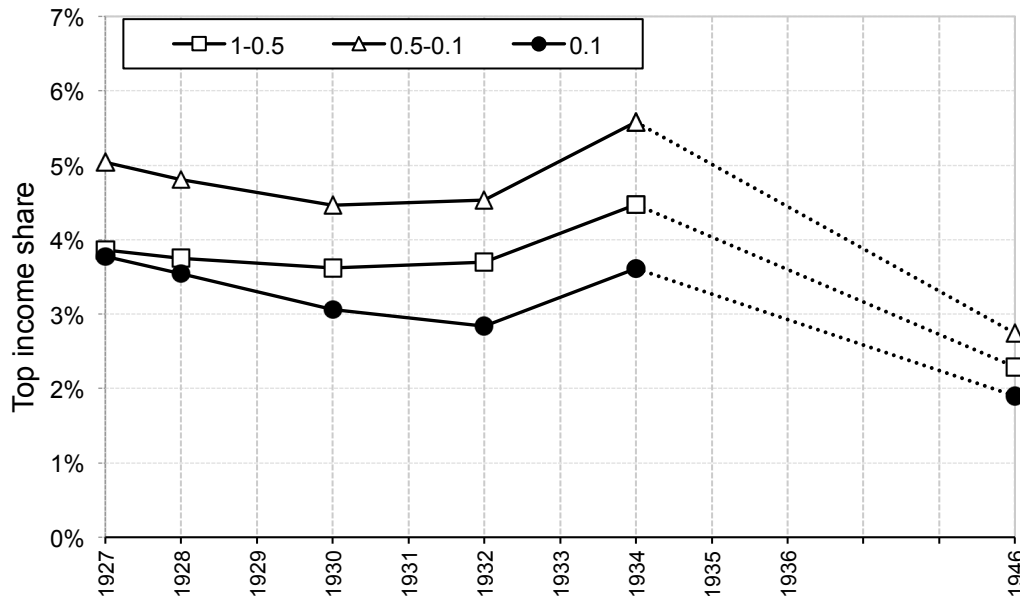


Fig 21: Top 1-0.5, top 0.5-0.1 and top 0.1 per cent in Slovakia, 1927-1946
Source: author's construction based on the income tax data

## 5.5. Wealth distribution before Communism

The strong concentration of capital income at the top of the income distribution is one defying feature of inequality in the first half of the 20th century. For example, Figure 22 indicates striking

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[73] See Novokmet 2017, especially chapters on Bulgaria and Poland for more on the effect of 'price scissors' on inequality during the Great Depression

inequality of capital income (dividends, interests, etc.). As a result, it is useful to have an insight in the wealth distribution, as top incomes are directly dependant on it (Morrisson 2000).
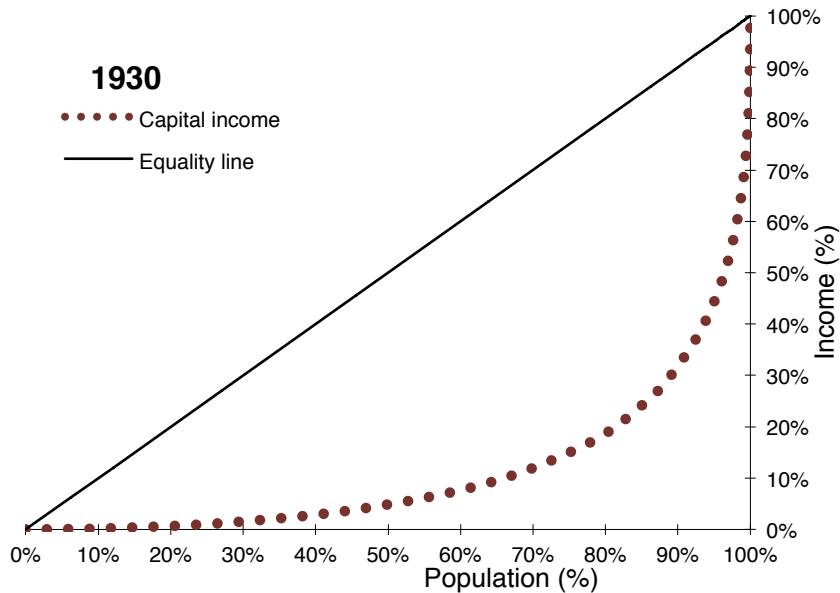


Figure 22: capital income recipients ranked according to capital income
Source: author's computation based on the income tax data
Note: capital income does not include business profits (from unincorporated businesses) and income from land and buildings

Evidence on the wealth distribution in the Czech Lands is scarce to be able to produce long run series on historical wealth distribution, but nonetheless, the available data for the interwar period provide us with the important findings that deserve its due attention. For example, a detailed statistics on wealth tax in 1919 allows the construction of a wide range of distribution estimates, including the top wealth shares. Figure 23 shows that top 10 per cent wealth share in the interwar Czechoslovakia was at the level of European countries. The top 1 per cent wealth share equally points to similar concentration patterns as in other European countries at the similar level of development such as Norway or Finland, but noticeably below some other (more advanced) countries like France or Netherlands (see appendix; we estimate Gini coefficient as equivalent to 0.76). However, one should bear in mind that the immediate post-war estimates could have been significantly affected by the war, either due to the property destruction in belligerent countries or due to international shocks that frequently accompany the war period.
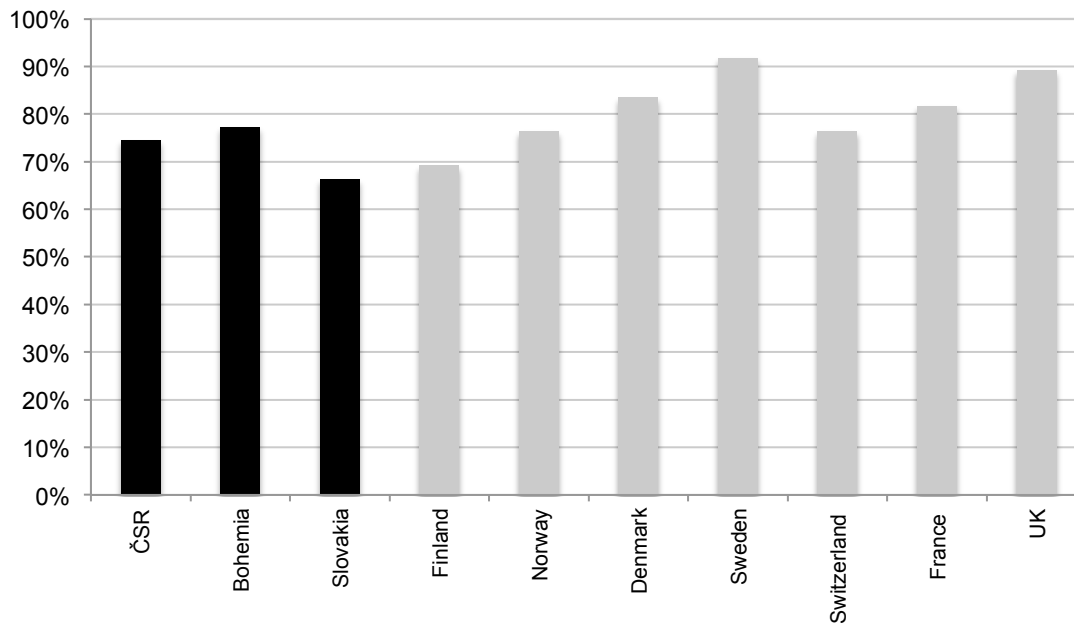
Figure 23: Top 10 per cent wealth share in 1919
Source: author's computation from the wealth tax data; other countries from Roine and Waldenstrom 2015

Data on the wealth composition is revealing, in the same way as the income composition was found to be central for understanding the evolution of top incomes. Fortunately, it is possible to observe wealth composition at two snapshots, at certain time distance, thus as a rough indicator of longer term patterns. Besides 1919, we have at our disposal also the data for 1943 when the wealth tax was introduced in the Protectorate of Bohemia and Moravia. First, Figure 24 depicts wealth composition for the Czech Lands in 1919. It can be seen that agricultural wealth dominates at the top decile level, all the way until the 0.5-0.1 per cent and then emerges again as the main asset source at the very top of the distribution. We have discussed the importance of large landowners and of the commercial agriculture in the Habsburg period, as well as the 'agricultural-industrial character' of the Czech Lands.[74] It can be seen that the grand nobility was still after the war the most prominent wealth holder in the country. As noted, land inequality was especially high in Central Europe before the First World War (Table 1). For example, most of the German millionaires before WWI were large landowners (Baten and Schulz 2005).

And one should bear in mind that the observed distribution in 1919 refers to the situation immediately preceding the big land reform, particularly directed against aristocratic (mostly Austrian) large estates. It was only in 1930s that the expropriation became substantial, affecting

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[74] The arable land in interwar Czechoslovakia accounted for a substantial part of the total country's area (around 43 per cent of its total surface in 1928 (see *Aperçu statistique* 1930, Tab. 1)) in comparison to western countries (Teichova 1988).

more than a third of the total land (Otahal 1963, Teichova 1988; Berend 1985, p. 159). The final result was a strong deconcentration of landed wealth. An increased pace of land reform and a devastating impact of the Great Depression contributed without doubt to the virtual elimination of top landholders from the very top of the wealth distribution. Many (German) big landowners hoped in vain for the repeal of land reform with the Nazi occupation (Glassheim 2005, pp. 195-200).
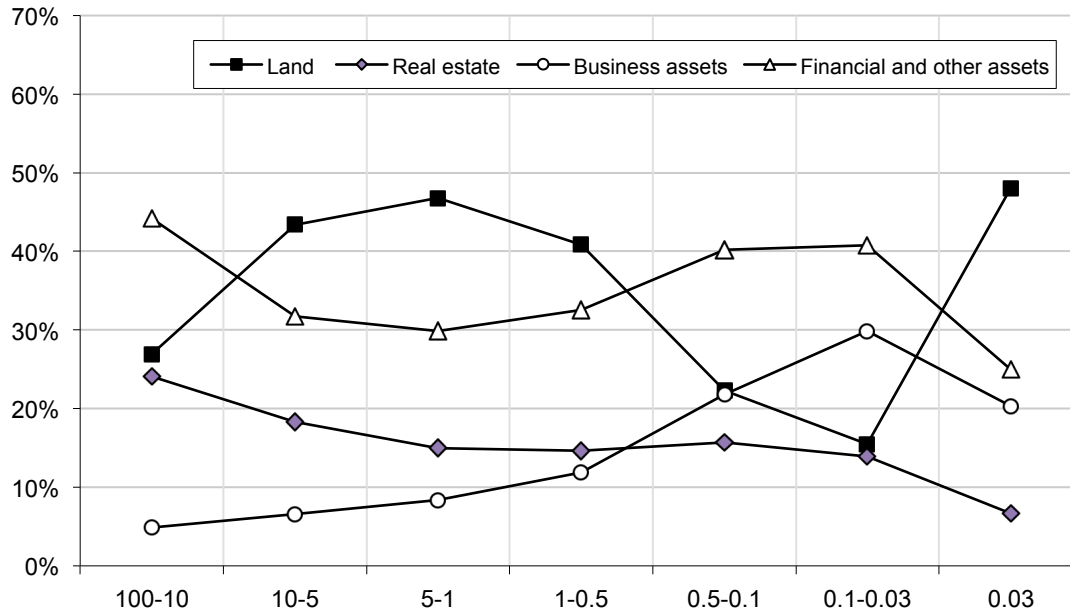


Figure 24: Asset composition in Bohemia in 1919
Source: author's computation based on the wealth tax statistics

Thus, by 1943 business assets became the most important component of the very top wealth-holding groups (Figure 25). In line with the previous discussion, it seems that big business owners were principal beneficiaries from the state economy in the late 1930s and the subsequent German occupation. The industrial capacity of the Protectorate was exclusively designated to serve the German war effort and the economic policy predominantly focused on the further industrial expansion, in particular of the armament programme. Consequently, one should aim to understand the distributional repercussions of income and wealth during the German occupation chiefly in the light of strategic priorities of the war economy. For example, Maxine Sweezy (1939, 1941) argued that Nazi's favoured concentration of wealth in order to induce higher saving and discourage private consumption (private wealth concentration was also

stimulated through the large-scale 'reprivatisation' of public capital (Bel 2006; Schweitzer 1946)).[75]

The war economy demanded high morale of Czech workers, and prevented to large extent unrestrained 'colonization' as practised in some industrially less developed countries in Eastern Europe.[76] Glassheim (2005, p. 205) notes, for instance, that Himmler vetoed any attempt at the land reform reversal, stressing the importance of securing high morale of Czechs. But at the same time, one observes a complete reversal in the importance of German capital in the economy, ascending to the dominant position after its role had been greatly diminished after WW1 (in the first place due to the 'nostrification' in the early 1920s, primarily intended to limit the influence of the German capital). Germany was thus only the fifth largest foreign direct investor in Czechoslovakia in 1937 (its share was 7 per cent of the total FDI), but already at the end of 1940 Germany became the leading direct investor and its share increased to 47 per cent of the total FDI (Teichova 1998, Tab. 14.4).[77] Krejči (1986; p. 454) finds that the extent of unrequited deliveries to Germany during the occupation equalled to more than one-third of GDP. In the course of few years, the 'Germanization' (*Eindeutschung*) of the economy took place, with the inducement toward the stronger industrial concentration, benefiting (strategic) big businesses accompanied by liquidations of medium and smaller businesses, appointing directors in firms with Czech owners[78] (Teichova 1998, pp. 288-9). Machonin (1996, p. 142) notes that the 'caste-like system' replaced the 'ordinary European class system'.[79]

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[75] In the same manner, high investment rates were pursued through the wage policy (both through workers' stimulation and exploitation).

[76] And also resulted in the indeterminate postponement of plans to 'Germanize' Czech Lands and eventually liquidate of the Czech nation (Endlosung) (Teichova 1998, p. 284; Machonin 1996, p. 141; Kural 1994).

[77] Enemy property (Teichova 1998, p. 286)

[78] Machonin (1996, p.142) notes that: "A 1941 statistical survey on the population employed in Czech industry showed that the share of Germans among its total labour force was 4.4 per cent, 12.8 percent among the employees of the Genral Administratives and Directories and 36.3% among the active owners and top managers.»

[79] Teichova (1998) explains the unambiguous colonial pretension of Germans by the mere term of Protectorate (after that for the French Morocco)
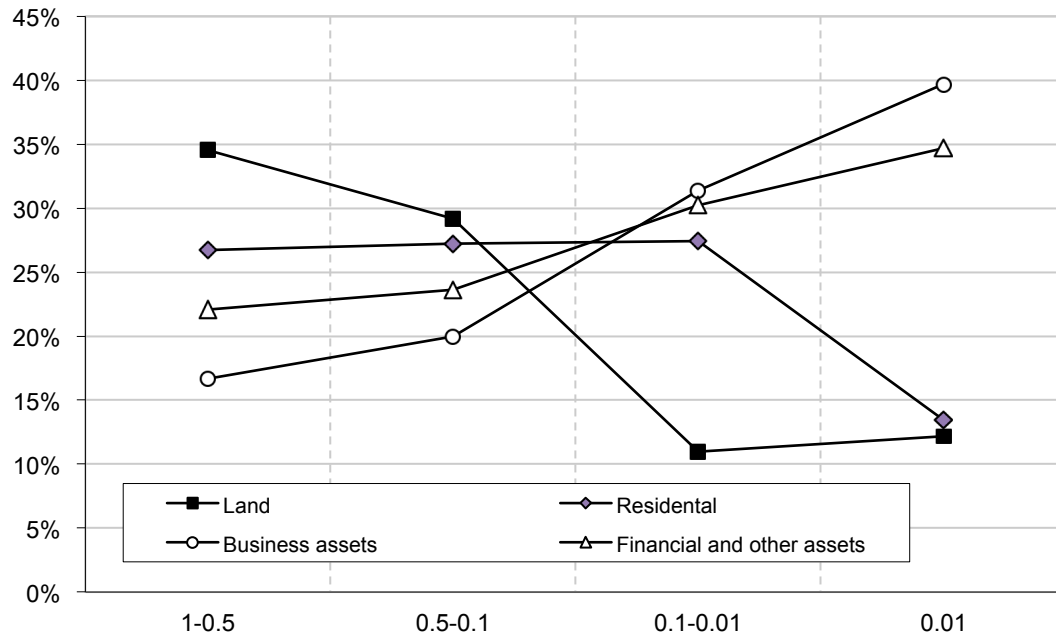
Figure 25: asset composition of the top 1 per cent wealth holders in the Protectorate of Bohemia and Moravia in 1943
Source: author's computation based on the wealth tax statistics

# 6. Communist Czechoslovakia

The communist experience clearly presents a landmark in the twentieth-century history in Central Eastern Europe and one should make it as the reference point when trying to ascertain the long-term distributional patters. Figure 1 shows that top incomes plummeted immediately after WWII. By 1946, the top 1 per cent income share almost halved from the levels observed during the Protectorate. Figure 2 further points that the very top shares saw the strongest fall. Thus, the fall of top 0.1 per cent share was more substantial than documented for lower constituent groups of the top percentile. In particular, the 'bottom' top 1-0.5 per cent experienced the smallest fall, while the top 5-1 per cent income share actually slightly increased.

But we should note that this fall occurred already before the communist takeover in 1948. Reasons should be searched for in the immediate proceedings of WWII. In the post-war disarray, the Nazi war economy was dismantled and the capital share in the economy sharply contracted (Krejči 1968; Teichova 1988, Tab. 3.3.). The top income composition during the Protectorate (Figure 16) suggests that the post-war fall was largely driven by the plunge in

business profits. Both official and private retributions were taken against the collaborating big business and war profiteers. Quite importantly, Germans, who had made previously important contribution to top income shares were expelled from the country (Map 1). In a spontaneous rally, the worker councils took over many large enterprises. [80] In fact, the large-scale nationalization had largely occurred before the communist takeover (notably, the Beneš's nationalization decrees), Teichova (1988) notes that by 1947 "nationalised industries and confiscated companies employed approximately 80 per cent or all workers and disposed of over two-thirds of Czechoslovakia's production capacity". Furthermore, top incomes suffered from the 1945 currency reform, the introduction of the taxation directed at top wealth holders (e.g. the 'millionaires levy'), etc. The communist takeover only exacerbated the fall and prevented the recovery of top shares (as seems to had been the case in Germany, where by 1950 top shares returned to their pre-war levels; Dell 2007).

The appropriation of the capital stock in the brief period after the WW2 eliminated capital (property) income as the important source of income dispersion at the top. And since capital income (business profits and dividends, land income, interests, etc.) made, as we saw, the predominant income source for high-income groups, there was a dramatic reduction in the concentration at the top. Following Piketty (2003), we show in Figure 26 the top 1 per cent of the income distribution and the top 1 per cent of the wage distribution. As can be seen, the decline in the top concentration in the communism was primarily caused by the fall in capital income, which accounted for the predominant part of the top percentile in the interwar era. This was Piketty's (2001, 2003) important finding for France that directly challenged the natural ('Kuznetsian') fall of inequality in the course of the development. The fall was anything but natural, caused by exceptional exogenous shocks that decimated capital incomes. As shown by Piketty, wage inequality in France was largely unaffected. However, wage compression did occur in countries that introduced communism, but as Figure 26 indicates, it was of secondary importance for the evolution of top incomes when compared with shocks incurred by capital incomes.

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[80] The communists actually brought an end to it.
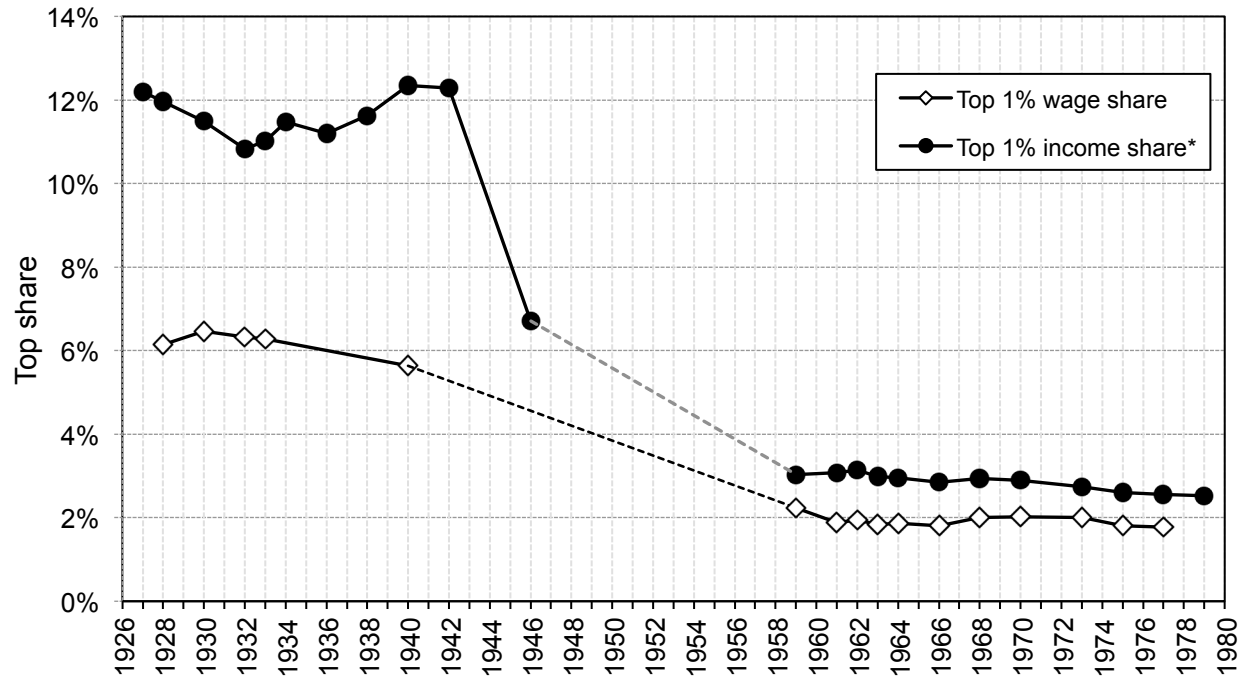
Figure 26: Top 1 per cent income share and the top 1 per cent wage share
Source: Top income share and top wage share in the interwar period: author's computation based on income tax statistics; both top income shares and top wage shares in the communist period constructed on the basis of employer surveys

Already by 1948, the largest part of the national wealth (close to 90 per cent fixed capital stock other than housing) was in public hands (Historicka Rocenka 1985). The expediency of the process is astonishing and its scope was extreme even in comparison to other communist countries. The first nationalization wave came about in 1945-47, and focused on big industry including over two thirds of productive capacity. Banks and trade were nationalized during the second wave in 1948, as well as all medium-sized businesses. During the next few years, almost all small businesses were affected. Collectivization of the land ensued, as something that, in words of Teichova (1988), would cement the "alliance between workers and peasants" (similar to the Soviet '*smychka* of the town and the village'). Household ownership was transformed into the right of personal use (Michalovic 1992). As a final blow, monetary reform of 1953 confiscated all personal savings.

On the other hand, the wage compression, which had already started in the mid-1930s and during the Protectorate (Večernik 1996), attained new pace under the communist system of central planning. In part, it was as a tool for rapid capital accumulation. As pointed out by Adam

(1974), the accumulation needs kept wages below the productivity rise,[81] and one of the principal means in achieving this consisted in forced narrowing of wage differential, even at the expense of sluggish productivity growth. The burden of increased investment spending fell mostly on white-collar workers since manual workers formed the basis of the communist support.[82] Among the communist countries, Czechoslovakia went furthest both in its reliance on the extensive growth model and in the extent of the compression the wage structure, and the two should not be looked upon in isolation. Wage setting process was thoroughly centralized with planners keeping monopoly on wage grids throughout the whole socialist period, leaving no discretion at the enterprise level (Munich, Švejnar and Terell 2000). The adverse repercussions on incentives was recognized early on and it did not lack criticism (e.g. Machonin 1968), but all attempts at the reform (even by the Party itself) failed to realize, either due to internal reasons such as the fear of the potential discontent of manual workers or due to the external Soviet pressure.

Once egalitarianism implemented, it stayed until the end. Moreover, its breadth was so thorough, that Atkinson and Micklewright could claim (1992, p. 104): "Among the Eastern European countries, Czechoslovakia stands out. The low recorded degree of earnings dispersion in Czechoslovakia is indeed remarkable, as is the relative stability of the distribution over a period of three decades" (see more Connor 1979; Krejči 1968; Večernik 1991).

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[81] Adam (1974, p. 47) comments that "it was raised to the status of a general law. It has become a dogma".

[82] The Czechoslovak communist Party (KSČ) retained its dominantly blue-collar base, restricting the entry of intelligentsia. Grzymala-Busse (2002, p. 31), in the cross-country overview, thus points out that "the KSČ was the only party to insist on its 'working-class' character until the very end."

# 7. The return to capitalism

The return to capitalism could be seen as the reverse process of the Communist equalization, manifested in the rising wage dispersion and the rising concentration of private capital income (Večernik 2001).  It has been acknowledged that income inequality strongly rose in the 1990s and that it was dominantly driven by the concentration at the top of income distribution (Večernik 2001; Atkinson 2008; Kahanec et al. 2012). The increase in inequality in the Czech Republic was primarily caused by a sudden jump in the top decile's share in the early nineties, which stabilized afterwards (Večernik 2001; Atkinson 2008). Plausibly, the great speed of transformation contributed to the observed immediacy of the increase. The speed was one of the most distinctive features of the Czech mass (or 'voucher') privatization, which stands as the prime example of the so-called 'big bang' privatization strategy. On the other hand, a more modest overall rise of inequality in the Czech Republic has been attributed to the mitigating effects of the social redistributive policies for the lower deciles, in particular due to the relatively more preserved scope of the welfare system after the transition (Ivanova 2006; Kahanec et al. 2012).

The top income series re-emerge only in the mid-2000s, and by then, most of the dispersion had already occurred. Figures 27a and 27b presents composition of the top percentile in the most recent period.[83] The overall composition suggests that the rise in the top percentile share after Communism was caused both by the rising wage and capital income concentration. However, today employment income is the most important source for top income groups. It can be seen that before the crisis, capital income (that is, other than income from employment) was the most important income source for the top 0.1 per cent. In contrast, in the interwar period capital income was already predominant source for lower percentiles (Figure 14a)

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[83] The series for the interwar and the recent period are based on the tax data while estimates for the communist period are constructed from the employer survey.
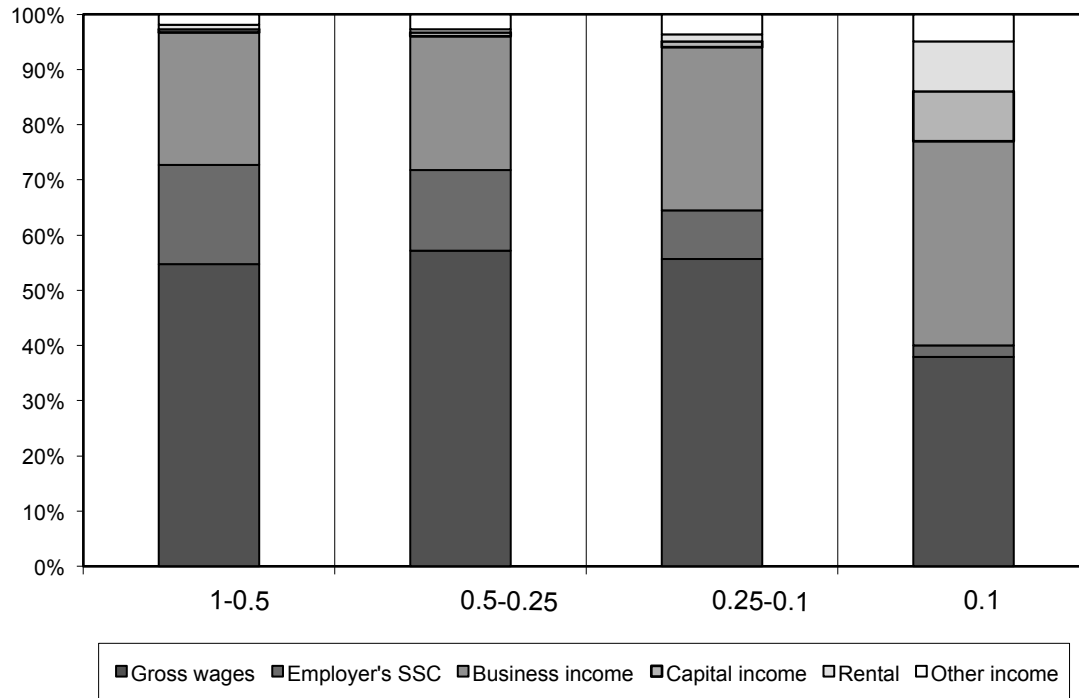
Figure 27a: Decomposition of top 1% by income source, the Czech Republic 2008
Source: author's computation based on the income tax data
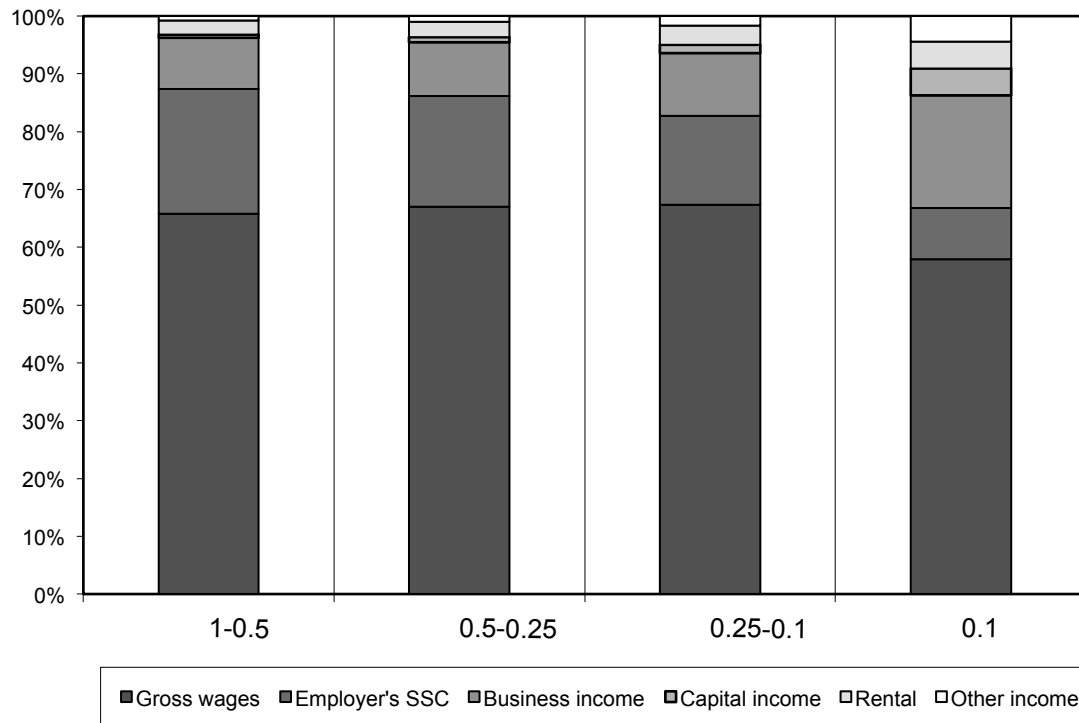


Figure 27b: Decomposition of top 1% by income source, the Czech Republic 2013
Source: author's computation based on the income tax data

A fall in the share of the top percentile since 2008 has been mostly induced by economic factors, in the first place due to the negative effects of the global economic crisis on the Czech economy. A fall was largely induced by the corresponding drop in the share of the top 0.1 per cent group (Figure 2), while lower income groups within the top percentile (top 1-0.5 per cent and top 0.5-0.1 per cent) have been more stable throughout this period. The income decomposition of the top 0.1 per cent clearly shows that it was business income that was hit hardest by the crises (Figure 27a and 27b) and generally has driven short-term fluctuations of top incomes. The Czech Republic, as a relatively small open economy, has traditionally been dependent on industrial exports and thus excessively vulnerable to shocks in external demand (in the first place in Germany, its main trading partner). [84] A specific pro-cyclical character of the top income shares evolution in the Czech Republic has been recorded both in the First Republic and today, where the low points in the top income levels correspond to the largest drops in industrial production. On the other hand, labour income at the top exhibited certain rigidity in both instances. Wages and salaries are more resistant to deflation (especially acute problem during the interwar period), but in general, there is an increase in inequality of labour income in crises due to higher unemployment (see section 5.2). In this respect, the recent appreciation that there are lessons to be learned from the Great Depression, equally applies when it comes to distributional issues.[85]

## 7.1. Top earnings

Following the preceding discussion, we consider first the importance of earnings for the top concentration. Top 0.1 per cent has returned to pre-WW2 levels. But the data suggest that today the 'working rich' dominantly populate the top of the distribution. In general, most theories trying to explain the rise of inequality in former communist countries in Central and Eastern Europe have concentrated on the shocks induced by the structural changes in the labour market that

[84] It is plausible that business income makes the predominant form of capital income, especially since incorporated dividend paying companies are mostly in foreign ownership (chapter 2). The unincorporated business forms are more frequent under the German corporate law (Dell 2007 for Germany, chapter 2 for Poland) Unfortunately, we cannot appreciate the contribution of capital income deducted at source, and it is fairly plausible that it is concentrated at the top (most notably dividends), thus making capital income more represented at higher levels of income distribution. Alternative sources on income distribution such as household surveys (e.g. EU-SILC) especially suffer from the poor coverage of the property income (Atkinson, Rainwater, and Smeeding 1995). Capital income category in the tax data refers to interest on given loans, which are reported on the tax return.

[85] For example, there is a similar conservative attitude taken by the Czech government in the recent crisis as evident in austerity measures and fiscal consolidation. Brada (1991), for instance, distinguishes 'fiscal conservatism' as the important intellectual legacy in the Czechoslovak policy, influental in both the pre-communist and the communist period.

resulted in growing earnings dispersion, such as decentralization of wage setting (Večernik 2001), a dissolution of the large communist wage-compressed state sector and the consequent shift of workers towards more wage-dispersed private sector (Milanović 1999), etc. The most robust explanation of rising earnings dispersion across studies has been attributed to a rising return to (higher) education, supressed during the communist regime. Rutkowski (2002, p. 34) thus notes that "high earnings inequality is to a large extent a cost of the revaluation of human capital that has taken place during the transition." Although this explanation is widely accepted, a word of caution should be made, as stressed by Atkinson (2008, p. 177), who points that the observed concentration at the top in the early transition could also imply 'monetization' of various benefits in kind enjoyed previously by a small communist elite (see Atkinson and Micklewright 1992, pp. 167-70).

After the initial surge in dispersion, distribution stabilized in the subsequent decade. However, the 2000s brought about a 'fanning out' of the top (Atkinson 2008). Figure 28 thus indicates that higher percentiles have risen more rapidly, for instance, as observed by faster rise of P95 than P90 (relative to the median). The highest percentiles (which exhibit stronger volatility) seem to have experienced especially rapid growth. This rise in earnings dispersion in the Czech Republic has been equally identified in the literature (e.g. Eriksson et al. 2013). Various arguments have been offered, frequently in the dominant supply and demand framework, where a substantial increase in demand for skilled workers has been attributed to skill-biased technological change (Katz and Murphy 1992).
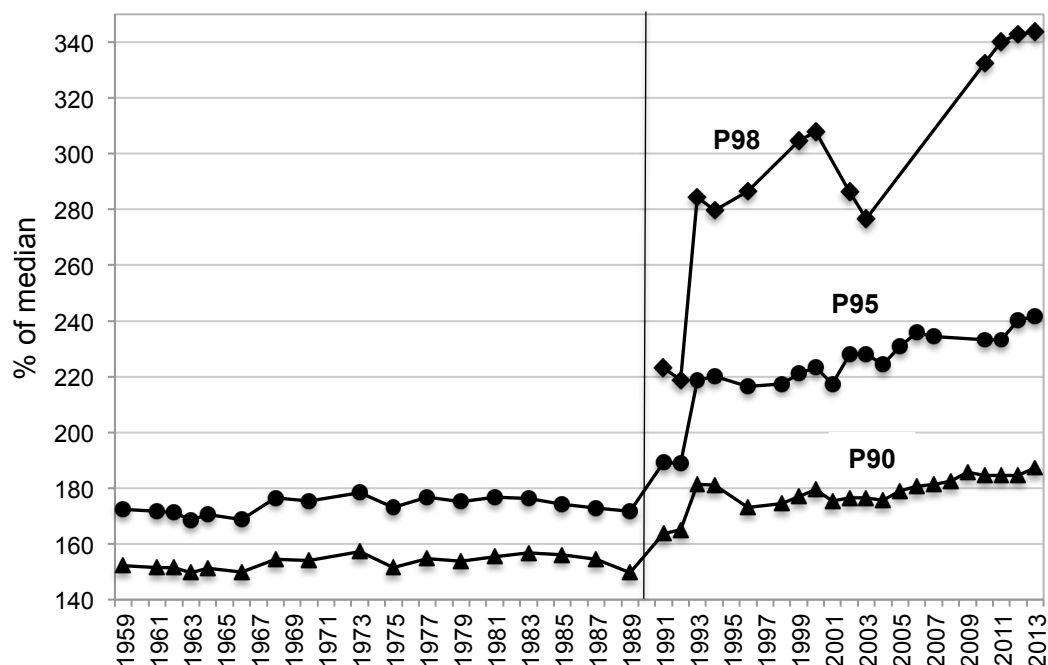
Figure 28: Top of the earning distribution in the Czech Republic
Source: 1990-2012: author's computation from Enterprise survey (see also Atkinson 2008); 1959-1989 from Atkinson and Micklewright  (1992) based on the Employer census (it refers to Czechoslovakia)

But, this framework, or 'economists' approach' (Atkinson 1997, p. 309), has long been recognized as an oversimplification. Moreover, in the context of rising top income shares, explanations based on the education premium are of little help, since the most critical wage differentiation has occurred among those with higher education. Namely, those in the top 1 (or more notably, in the top 0.1) per cent have been disproportionately well-rewarded in the labour market with respect to their former fellow students (Atkinson et al. 2011, p. 58). Consequently, it is important to have a more detailed insight at what is happening within the top groups.

Atkinson (2007, p. 36) thus points to the "globalisation of the demand side of the market for top managers, one group for whom movement across national borders is significant. Corporations are now seeking to recruit globally to the upper echelons of their organization". To a certain degree, this explanation is closely related to the 'superstar' theory of Rosen (1981). In the light of this theory we could perceive high salaried individuals in the Czech Republic, such as the top executives, (similarly as hockey or football players) as individuals in possession of special organizational and technical talents and often coming from abroad.  Atkinson (2008) has thus proposed a combination of the superstar theory with the so-called hierarchical theory (e.g. see Lydall 1959) in order to explain rising earning dispersion in OECD countries.  In particular, he singles out three principal mechanisms leading to higher earning concentration: "increased concentration of superstar rents, resulting from technology and trade; increasingly steep pay hierarchies in pyramidal organizations; switch from hierarchical pay to rent-sharing" (Atkinson 2008, p. 78).

We can tentatively argue that the higher prominence of multinational enterprises (MNEs) in the Czech Republic (see below) could account for some dispersion at the very top, as top personnel of MNE's are often paid by global ('western') remuneration standards, which makes them quite distinguishable in comparison to the average Czech earnings.

## 7.2. Capital transformation

The historical transformation from public to private capital after the fall of communism in Eastern Europe could have critically impacted distributional patterns. Communist Czechoslovakia was, as we saw, characterized by exceptionally high level of public capital ownership, a proportion that was extraordinary even in comparison to other communist countries in Eastern Europe. But in spite of it (or rather in large part exactly because of it), the Czech Republic embarked on a thorough privatization program whose main feature was to be its speed[86] that would allow a comprehensive grasp and guarantee the irreversibility of the process.

Another feature was that it principally took a form of mass (voucher) privatization with mostly free provision of assets to the public. It enjoyed initially a large public support because it was perceived as fair and inclusive. It was assumed best to leave everything to market forces, which could efficiently identify highest value users (and result in certain concentration that would mitigate potential repercussions that diffused ownership might have on corporate governance). However, it turned out that the big-bang approach as implemented in the Czech Republic (and Russia) only led to the 'big-bang' disappointment. It resulted in restructuring chaos, which amid weak institutional framework benefited very few, and for the majority of population vouchers turned out practically worthless. Above all, privatization was quite often surrounded by the lack of transparency. The widespread conception has been that the process resulted in the strong wealth concentration, quite the opposite of the 'popular ownership' initially promised. This could be related to breaking the myth of the 'Czech miracle', which was reflected in widespread bankruptcies, bank failures, privatization scandals and corruption, (e.g. 'tunnelling'), etc. Thus, Martin Myant (2003) has advanced that afterwards the 'Czech capitalism' was replaced by the convergence based on foreign capital.[87]

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[86] The so called 'Big bang' approach in opossite to the 'gradual' privatization. It was epitomized by the Prime Minister Vaclav Klaus, and was one of the reasons behind the Velvet Divorce (the Slovaks under Mečiar more in favour of the gradual approach).

[87] Initially, in the midst of reawakening of the national identity all over the former communist bloc, a notion about the link between economic and political sovereignty became pervasive and resulted in a sentiment of general aversion to foreign ownership (for example, see Bandelj 2008). One should be reminded here of a similarity to the above-mentioned interwar experience, when the perception of a need for greater national ownership had been equally present.

There is scarce evidence on the wealth inequality in the Czech Republic.[88] Alternative way to gauge the wealth concentration is by looking at the development of private wealth-income ratio (Piketty and Zucman 2014). Piketty (2014) has recently brought attention to 'natural' economic forces that result in rising concentration of capital income. He suggests that the rising wealth-income ratio $\beta$ (as evidenced in advanced countries in the last decades; primarily due to the growth slowdown in accordance with Harrod-Domar-Solow formula $\beta = s/g$) leads to a rising capital share in national income as the rate of return on wealth exceeds the rate of growth of national income $(r > g)$.[89] Since capital income is generally more unequally distributed, this could negatively affect personal inequality. Consequently, it is important to follow developments in the private wealth.

Figure 29 shows that private wealth in the Czech Republic has been slightly less than three years of national income, which is lower than what Piketty and Zucman (2014) found for developed European countries. In this respect, the importance of wealth in these 'wealth-young' countries[90] is comparatively smaller. Moreover, it is mostly composed of housing, which is generally found to be more equally distributed (see Novokmet 2017, ch. 5).
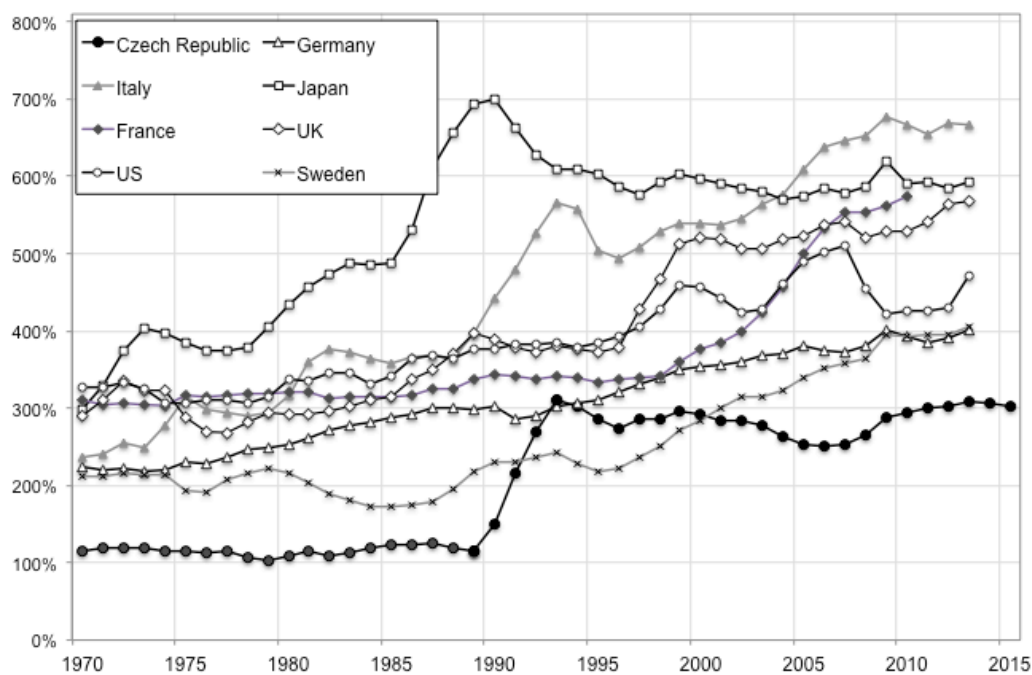
[88] E.g. see Credit Suisse on the international wealth distribution (Davies et al. 2014)
[89] However, this requires that elasticity of substitution between capital and labour is higher than 1.
[90] A term used by Milanović 2015

Figure 29: Private wealth in the Czech Republic and selected countries, 1970-2015 (as % of national income)
Source: Novokmet 2017, ch. 5; WID

On the other hand, it has been found that the financial wealth, especially corporate securities have been quite unequally distributed, making at the same time the bulk of wealth of the rich (Glynn 2009, Saez and Zucman 2015; Roine and Waldenstrom 2015).[91] In this respect, the major ownership of corporate wealth by the rest of the world implies that most holders of top capital incomes are foreigners. Here one observes clear similarity with the Habsburg Empire ('Vienna' effect; Figure 7). The importance of foreign capital has risen and the net international investment position has turned from small positive values in early 1990s to negative values around 50 per cent of national income today. The importance of foreign capital could be substantial for a small open economy as the Czech Republic. Today around 10 per cent of Czech national income goes abroad as remuneration to foreign capital. This amount stands for as much as the half of the capital income that has been generated in the country. Large positive trade balance has been required in order to stabilize the net foreign asset position.

The top income shares could be clearly impacted in a significant way if foreigners own a non-negligible part of the corporate stock. Moreover, large capital outflows indicate high returns (as a proportion of net foreign assets), meaning that foreign capital acquired high-yielding corporate stock. In general, corporate stock is much more unequally distributed than the total wealth. Note for instance that the wealth of the top wealth holders worldwide most often consists of equity holdings (both of non-listed and listed corporations) (Saez and Zucman 2015). In addition, private capital in the Czech Republic is mostly composed of housing and (relatively low-yielding) safer financial instruments, which is usually more equally distributed[92] and quite negligible for top wealth individuals.

Thus, the importance of capital income for top income shares could be similarly affected by the significant extent of foreign ownership as had been previously by pervasive state ownership (in much more limited scope).[93] For example, Kessler and Wolf (1991) attributed lower documented

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[91] The Czech households dominantly hold safer instruments such as currencies

[92] Note that the ownership of housing is widespread in Central Eastern Europe.

[93] Similarly, capital income at the top could be affected by higher proportion of retained earnings in corporations not included in taxable income (Atkinson 2007b).

wealth inequality in France than in the US in 1980s primarily to the fact that higher level of non-private (in this case state ownership) of the corporate stock in France than in the US.
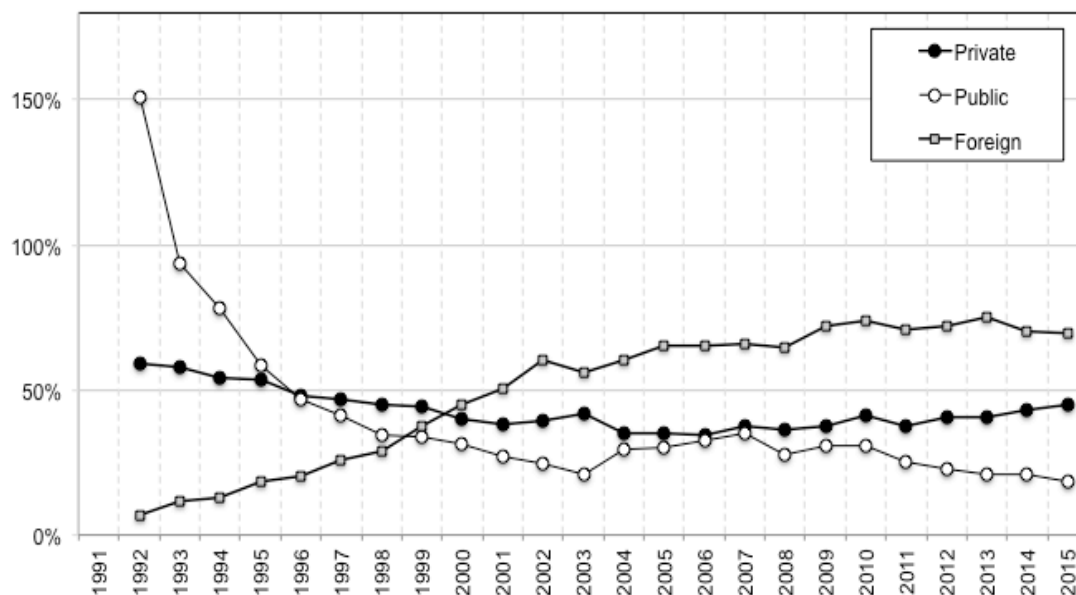


Figure 30: The ownership of Czech corporations by sectors: equity holdings as proportion of national income
Source: Novokmet 2017, ch. 5

# 8. International Comparison

Figure 31 shows a development of the top percentile in the Czech Republic together with Germany, France and Sweden in the course of the twentieth century. All countries have experienced a secular fall in inequality over the century, with strongest fall occurring after the world wars. The First World War saw a rise in top income shares in all countries. The Second World War was devastating for the top percentile in belligerent France, while it had rather modest effects in the Czech Republic and Sweden, where the actual warfare did not take place. The fall of the top percentile in the Czech Republic immediately after WW2 is astounding. All countries displayed stability in top income shares in post-war decades, however, it took place at notably different levels. We observe highest top shares in the Germany, and the lowest in communist Czechoslovakia. In the last two decades, top income shares have significantly increased in the Czech Republic.
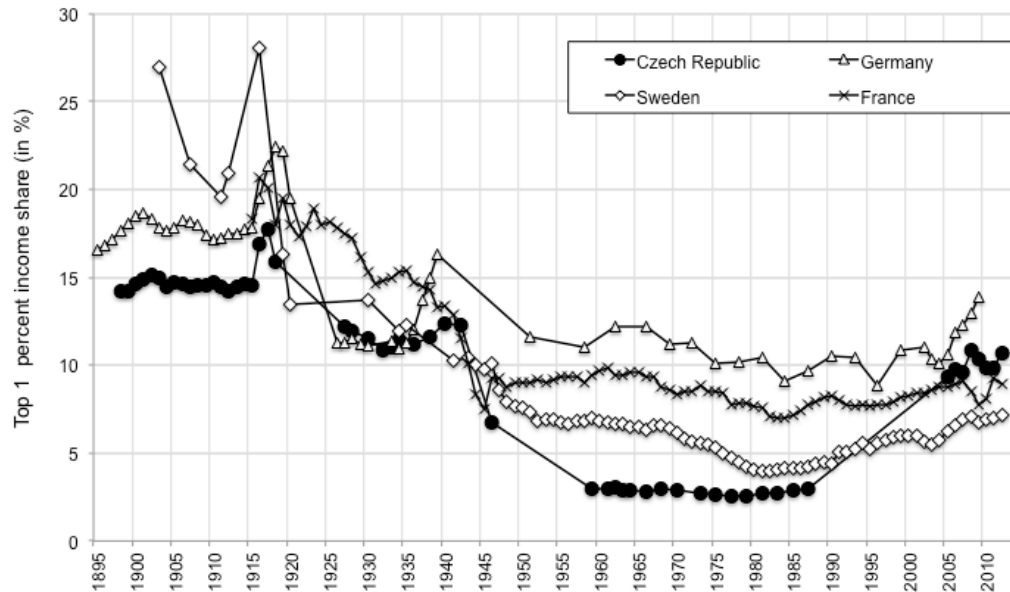
Figure 30: Top 1 per cent share in the Czech Republic, Germany, France, and Sweden
Source: WID

# 9. Conclusion

This paper has examined the evolution of the top income shares in the Czech Lands from the end of the 19th century until today. Top income shares followed a U-shaped evolution in the course of the 20th. Higher shares in the first half of the 20th century were a consequence of the stronger concentration of capital at the top of income distribution. The long-run fall in top shares was equally 'capital income phenomenon'. A sharp decline in the first half of the twentieth century was largely due a drop in the top percentile share. On the other hand, the top shares below the top percentile (top 5-1%), largely composed of labour income, exhibited relatively more stable pattern. Communism led to the virtual annihilation of private capital income and the stumbling of top income shares. A sharp decline in the first half of the twentieth century was largely due a drop in the top percentile share. After residing at very low levels featured by remarkable stability for several decades, top income shares have increased after the fall of communism.

## Table A1: Top income shares (in %)

| Year | P90-100 | P95-100 | P99-100 | P99.5-100 | P99.9-100 | P99.99-100 | P90-95 | P95-99 | P99-99.5 | P99.5-99.9 | P99.9-99.99 |
|------|---------|---------|---------|-----------|-----------|------------|--------|--------|----------|------------|-------------|
| 1897 |      | 24,6 | 13,2 | 10,2 | 5,8 | 2,6 |      | 11,4 | 3,0 | 4,4 | 3,2 |
| 1898 |      | 24,6 | 13,2 | 10,2 | 5,8 | 2,6 |      | 11,4 | 3,0 | 4,4 | 3,2 |
| 1899 |      | 24,4 | 13,2 | 10,3 | 6,0 | 2,8 |      | 11,2 | 3,0 | 4,3 | 3,2 |
| 1900 |      | 24,7 | 13,3 | 10,2 | 5,9 | 2,7 |      | 11,5 | 3,0 | 4,3 | 3,2 |
| 1901 |      | 25,8 | 13,7 | 10,5 | 6,0 | 2,7 |      | 12,1 | 3,1 | 4,5 | 3,3 |
| 1902 |      | 26,6 | 14,0 | 10,8 | 6,1 | 2,8 |      | 12,5 | 3,3 | 4,7 | 3,4 |
| 1903 |      | 26,5 | 13,9 | 10,6 | 6,0 | 2,7 |      | 12,6 | 3,2 | 4,6 | 3,3 |
| 1904 |      | 26,4 | 13,8 | 10,6 | 6,1 | 2,8 |      | 12,5 | 3,2 | 4,5 | 3,3 |
| 1905 |      | 26,4 | 13,8 | 10,6 | 6,0 | 2,7 |      | 12,6 | 3,2 | 4,6 | 3,3 |
| 1906 | 34,7 | 26,1 | 13,6 | 10,3 | 5,8 | 2,5 | 8,6 | 12,6 | 3,2 | 4,6 | 3,3 |
| 1907 | 34,8 | 26,3 | 13,8 | 10,6 | 6,0 | 2,6 | 8,5 | 12,6 | 3,2 | 4,6 | 3,4 |
| 1908 | 34,8 | 26,3 | 13,9 | 10,7 | 6,1 | 2,7 | 8,5 | 12,5 | 3,2 | 4,6 | 3,4 |
| 1909 | 35,4 | 26,7 | 14,0 | 10,8 | 6,1 | 2,7 | 8,7 | 12,7 | 3,3 | 4,7 | 3,4 |
| 1910 | 34,9 | 26,4 | 14,0 | 10,8 | 6,1 | 2,7 | 8,5 | 12,5 | 3,2 | 4,6 | 3,4 |
| 1911 | 34,4 | 26,0 | 13,8 | 10,6 | 6,0 | 2,6 | 8,3 | 12,3 | 3,2 | 4,6 | 3,4 |
| 1912 | 34,1 | 25,9 | 13,8 | 10,7 | 6,1 | 2,7 | 8,2 | 12,1 | 3,1 | 4,6 | 3,4 |
| 1913 | 35,3 | 26,9 | 14,7 | 11,4 | 6,5 | 2,9 | 8,3 | 12,2 | 3,3 | 4,9 | 3,7 |
| 1914 | 34,7 | 26,5 | 14,5 | 11,3 | 6,4 | 2,7 | 8,2 | 12,0 | 3,3 | 4,8 | 3,7 |
| 1915 | 35,7 | 28,1 | 17,1 | 13,9 | 8,8 | 3,8 | 7,5 | 11,1 | 3,2 | 5,1 | 5,0 |
| 1916 | 35,3 | 28,4 | 18,1 | 15,1 | 9,8 | 4,3 | 7,0 | 10,3 | 3,0 | 5,3 | 5,5 |
| 1917 | 34,3 | 27,4 | 16,5 | 13,4 | 7,9 | 3,2 | 6,8 | 10,9 | 3,1 | 5,5 | 4,7 |
| 1927 | 35,6 | 25,6 | 12,1 | 8,9 | 4,5 | 1,7 | 10,0 | 13,5 | 3,2 | 4,4 | 2,8 |
| 1928 | 34,5 | 25,0 | 12,0 | 8,9 | 4,7 | 1,9 | 9,5 | 13,0 | 3,1 | 4,2 | 2,7 |
| 1930 | 35,8 | 25,3 | 11,5 | 8,4 | 4,2 | 1,7 | 10,5 | 13,8 | 3,1 | 4,2 | 2,5 |
| 1932 | 36,9 | 25,7 | 10,8 | 7,5 | 3,3 | 1,0 | 11,1 | 14,9 | 3,3 | 4,3 | 2,3 |
| 1933 | 37,3 | 25,9 | 11,0 | 7,7 | 3,3 | 1,0 | 11,4 | 14,9 | 3,3 | 4,4 | 2,3 |
| 1934 | 38,5 | 26,8 | 11,5 | 8,0 | 3,5 | 1,1 | 11,6 | 15,4 | 3,5 | 4,5 | 2,4 |
| 1936 | 37,2 | 26,3 | 11,6 | 8,3 | 3,9 | 1,3 | 10,9 | 14,6 | 3,3 | 4,5 | 2,6 |
| 1938 | 36,1 | 26,6 | 12,4 | 9,1 | 4,5 | 1,6 | 9,5 | 14,2 | 3,3 | 4,6 | 2,9 |
| 1940 | 35,7 | 26,3 | 13,0 | 9,7 | 5,1 | 1,8 | 9,4 | 13,3 | 3,2 | 4,7 | 3,3 |
| 1942 |      | 25,3 | 12,7 | 9,4 | 5,3 | 2,0 |      | 12,7 | 3,3 | 4,1 | 3,4 |
| 1946 | 30,5 | 19,0 | 6,5 | 4,4 | 1,8 | 0,5 | 11,4 | 12,5 | 2,1 | 2,6 | 1,3 |
| 1958 | 20,4 | 11,5 | 2,9 |      |      |      | 8,9 | 8,6 |      |      |      |
| 1965 | 18,4 | 10,2 | 2,5 |      |      |      | 8,2 | 7,7 |      |      |      |
| 1970 | 19,0 | 10,9 | 3,0 |      |      |      | 8,1 | 7,9 |      |      |      |
| 1973 | 18,1 | 10,1 | 2,6 |      |      |      | 8,0 | 7,5 |      |      |      |

| 1976 | 18,0 | 10,0 | 2,5  |     |     |     | 8,0  | 7,5 |     |     |
|------|------|------|------|-----|-----|-----|------|-----|-----|-----|
| 1980 | 18,3 | 10,2 | 2,6  |     |     |     | 8,1  | 7,6 |     |     |
| 1985 | 17,9 | 10,0 | 2,6  |     |     |     | 7,9  | 7,4 |     |     |
| 1988 | 18,5 | 10,6 | 2,9  |     |     |     | 7,9  | 7,7 |     |     |
| 2005 | 31,6 | 22,0 | 9,2  | 6,4 | 3,2 | 1,2 | 12,7 | 2,8 | 3,2 | 2,1 |
| 2006 | 32,4 | 22,7 | 9,3  | 6,3 | 3,2 | 1,1 | 13,4 | 2,9 | 3,1 | 2,0 |
| 2007 | 32,4 | 22,6 | 9,0  | 6,1 | 3,0 | 1,1 | 13,5 | 2,9 | 3,1 | 1,9 |
| 2008 |      |      | 10,3 | 7,9 | 4,4 | 1,9 |      | 2,4 | 3,5 | 2,5 |
| 2009 |      |      | 9,6  | 7,2 | 3,8 | 1,5 |      | 2,4 | 3,4 | 2,3 |
| 2010 |      |      | 9,1  | 6,7 | 3,4 | 1,3 |      | 2,3 | 3,3 | 2,1 |
| 2011 |      |      | 9,2  | 6,7 | 3,3 | 1,2 |      | 2,4 | 3,4 | 2,1 |
| 2012 |      |      | 9,8  | 7,4 | 4,0 | 1,7 |      | 2,5 | 3,4 | 2,3 |
| 2013 |      |      | 9,3  | 6,4 | 2,8 | 0,9 |      | 2,9 | 3,6 | 1,9 |
| 2014 |      |      | 9,4  | 6,5 | 2,8 | 0,9 |      | 2,9 | 3,7 | 1,9 |
| 2015 |      |      | 9,6  | 6,7 | 3,0 | 1,0 |      | 3,0 | 3,7 | 2,0 |

Note: 1897-1917 refer to Habsburg provinces Bohemia, Moravia and Silesia; 1927-1936 refer to First Czechoslovak Republic; 1938-1942 to the Protectorate of Bohemia and Moravia; 1946-1988 refer to Czechoslovak Socialist Republic; 2005-2015 to the Czech Republic

# A.1. Personal income tax data in the Czech Lands from the 19th century until today

### Income tax in Imperial Austria

Imperial Austria (Cisleithania) introduced the modern income tax in 1896, and it was put into operation in 1898. For its model, it took the Prussian income tax of 1891. The new income tax replaced the old schedular tax from 1849 (Sieghart 1898) as a move towards more comprehensive (Haig-Simon) definition of taxable income. In general, the new taxation allowed very few exemptions. Income was defined as net income after subtraction (from revenues) of costs needed to obtain, secure and maintain it. Income below 1,200 crows was tax exempt.
The tax unit was family with the total income of family members ascribed to the head of family. The structure of the tax was progressive. The fixed tax liability was applied to each bracket. The tax was imposed on income of the preceding calendar year, or the average income of the previous three years when income varied through years (Sieghart 1898, Van Siecle 1931).[94] The tax law defined following taxable income sources: income from land, from buildings, from business and self-employment, from capital and from other sources (Van Siecle 1931, p. 35).

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[94] The latter practice was abandoned in 1914 (Ryba 1924, p. 7*).

Taxable income also included imputed rents of owner-occupiers and own consumption. Capital gains were exempt, except when made as a part of general business activity. Income from land was assessed based on the cadastral net yield.

Income tax tabulations for each region of Imperial Austria were published in the annual Reports of the Ministry of Finance (*Mitteilungen des K.K. Finanz-Ministeriums*) and in the Statistical Yearbooks[95]. Note that statistics are presented for the 'fiscal' year, which refers to the income of the previous year.

## Income tax in interwar Czechoslovakia

After its formation in 1918, Czechoslovakia inherited tax system of Austria-Hungary. But now two distinctively different tax systems had been operating in the country, as a consequence of different tax legislation between the Austrian ('Cisleithania') and the Hungarian ('Transleithania') of the monarchy (Vencovsky 1997, p. 324). A much-needed reform toward modern unified tax system had to been postponed until the economic stabilization was accomplished. This primarily entailed strong currency, so indisputably pursued by Alois Rašin, and policy of balanced budget, personified by Karel Engliš (Vencovsky 1997, p. 332), the famous Czech economist who succeeded Rašin as the finance minister[96]. With the termination of deflationary policy of the early 1920s and few years of strong growth that stabilized public finance, Engliš engaged in the thorough reform of tax system. The reform focused on direct taxes, most notably on income tax, with the aim of "reducing high tax burden and promoting capital accumulation and entrepreneurship" (Vencovsky 1997, pp. 328, 332-3).

Taxpayers in tabulations are ranked according to the level of gross income, before personal deductions and personal income tax. It is important to note that the statistics used to construct top income shares relates to 'direct taxpayers' (*poplatníci přímo zdanění*) and does not include 'withholding' taxpayers (*poplatníci srážkoví*). Namely, an individual was not obliged to submit the tax return if (s)he obtained income exclusively from employment, for which the tax obligation was deducted at source and considered as final. However, this special case was only applicable when the annual income from employment - as the only income source - was above 10,356 Kč (in which case an employee did not pay income tax) and below 23,566 Kč (above which the taxpayer was designated as a 'direct' taxpayer) (Fajfr 1935, p. 14). Most importantly, if the taxpayer earned income above 23,566 Kč, (s)he was designated as 'direct' taxpayer, and thus included in the income tax statistics. In consequence, this allowed a construction of income shares for the top 5 per cent of the population. The stated amounts (applicable in 1930) refer to 'gross' wage, that is, before the deduction of allowed lump-sum expenses.[97] The exception was in the event when the 'family member' (other than the head of the family) had earned income

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[95]  Tables in the statistical yearbook: *Die Ergebnisse der Veranlagung der Personaleinkommensteuer*

[96] After the assassination of the former

[97] A deduction of lump sum expenses from the 'gross' wage was allowed as following: 20% for the first 20,000Kč, 10% for the amount between 20,000Kč and 30,000Kč, and 5% for the amount above 30,000Kč (Novotny 1937, p. 69).

from employment, when this income alone is not added to the family head. For example, this could have led to the underestimation of household income if the wife and children of the family head obtained this type of income. However, this should not affect the obtained results in important way, especially for higher top income shares.

The data for interwar Czechoslovakia are found in official publications of income tax statistics. After the reform of tax system in 1927, these were published with four (to five) years lag. Thus, the statistics for the first available year 1927 were published in 1931, and the last official publication before German annexation in 1938 refers to income year 1933. Even in this brief period, statistics were published only for the following years: 1927 (Státní úřad statistický 1931), 1928 (Státní úřad statistický 1932), 1930 (Státní úřad statistický 1935), 1932 (Státní úřad statistický 1937), and 1933 (Státní úřad statistický 1938). As a preparation for the new tax reform of 1927, the Statistical office published income tax report for the Czech lands for the 1914-1918 period (Státní úřad statistický 1924), which also contains report for years from 1898 (from the introduction of the income tax in Cisleithania (Van Sickle 1931) to 1913.

The published reports are quite detailed, dividing tax units into 22 brackets (according to tax rate that was applied progressively form 2 to 28 per cent (the highest rate was applied to incomes above 5 mil Kč) (Novotny 1937, pp. 57-8), and each bracket containing the number of tax units and their corresponding estimated income and tax liability. In addition, total income is decomposed by income sources: income from land (z pozemků), from buildings (z budov), from business and self-employment (z výdělečných podniků a zaměstnání), employment (ze služebního poměru), from capital (z kapitálu). It also included imputed non-monetary income such as rent of owner-occupiers (užitková hodnota bytu ve vlastním domu) or own consumption of households. Decomposition is also available by region (Bohemia, Moravia and Silesia, Slovakia, and Subcarpathian Ruthenia). Required filing threshold was set to 6,000 Kč (*Koruna československá*).

Income data for 1946 were obtained from the returns of the general wealth levy related to the currency reform of 1945 (St. Digest 1948, p. 107; Michal , p. 459). This peculiar reporting occurred due to the fact that there was no time for separate assessment of income tax. Everyone had to submit the tax return (, which were then distinguished as 'declarations of persons liable to levy' (*přiznání s dávkou*) and 'declarations of persons not liable to levy' (*přiznání bez dávky*) (St. Digest 1948). Reported income refered for the month of September in 1946, and was aggregated to corresponded to the whole year income (Dolansky 1947, p. 157). The income tax legislation for 1946 preserved the structure from the interwar era (Žatecký 1946).

## Table A2. Income Tax Data, 1897-1946

| Income year | Publication | Table and page |
|---|---|---|
| 1897 | Österreichisches Statistisches Handbuch für... 1900 | Tab. 7d; p.334 |
| 1898 | Österreichisches Statistisches Handbuch für... 1901 | Tab. 7d; p.332 |
| 1899 | Österreichisches Statistisches Handbuch für... 1902 | Tab. 7d; p.337 |
| 1900 | Österreichisches Statistisches Handbuch für... 1903 | Tab. 7d; p.334 |
| 1901 | Österreichisches Statistisches Handbuch für... 1904 | Tab. 7d; p.386 |
| 1902 | Österreichisches Statistisches Handbuch für... 1905 | Tab. 7d; p.437 |
| 1903 | Österreichisches Statistisches Handbuch für... 1906 | |
| 1904 | Österreichisches Statistisches Handbuch für... 1907 | Tab. 7d; p.448 |
| 1905 | Österreichisches Statistisches Handbuch für... 1908 | Tab. 7d; p.378 |
| 1906 | Österreichisches Statistisches Handbuch für... 1909 | Tab. 7d; p.449 |
| 1907 | Österreichisches Statistisches Handbuch für... 1910 | Tab. 7d; p.467 |
| 1908 | Österreichisches Statistisches Handbuch für... 1911 | Tab. 9.4; p.445 |
| 1909 | Österreichisches Statistisches Handbuch für... 1912 | Tab. 9.4; p.446 |
| 1910 | Österreichisches Statistisches Handbuch für... 1913 | Tab. A.11.d; p.393 |
| 1911 | Österreichisches Statistisches Handbuch für... 1914 | Tab. A.11.d; p.441 |
| 1912 | Österreichisches Statistisches Handbuch für... 1915 | Tab. A.12.d; p.385 |
| 1913 | Österreichisches Statistisches Handbuch für... 1916 | Tab. A.12.d; p.430 |
| 1914 | Daň z příjmu ... v letech 1914-1918 | Tab. 67, 68; pp. 58-9 |
| 1915 | Daň z příjmu ... v letech 1914-1918 | Tab. 67, 68; pp. 58-9 |
| 1916 | Daň z příjmu ... v letech 1914-1918 | Tab. 67, 68; pp. 58-9 |
| 1917 | Daň z příjmu ... v letech 1914-1918 | Tab. 67, 68; pp. 58-9 |
| 1927 | Statistika daně důchodové placené přímo... za rok 1927 | Tab.1, p.20; Tab.6, p.108 |
| 1928 | Statistika daně důchodové placené přímo... za rok 1928 | Tab.1, pp.22-3; Tab.7, pp.176-7 |
| 1930 | Statistika daně důchodové placené přímo... za rok 1930 | Tab.1, p.8; Tab.7, pp.44-5 |
| 1932 | Statistika daně důchodové placené přímo... za rok 1932 | Tab.1, p.10; Tab.7, pp.44-7 |
| 1933 | Statistika daně důchodové placené přímo... za rok 1933 | |
| 1934 | Zprávy státního úřadu statistického XVII (1937), 170 | Tab.1 , pp. 1298-9 |
| 1936 | Zprávy státního úřadu statistického XX (1939), 39 | Tab.2, pp. 290-1 |
| 1938 | Zprávy Ústředního statistického úřadu XXII (1941), 101-4 | Tab. 2, pp. 758-9 |
| 1940 | Zprávy Ústředního statistického úřadu XXIII (1942), 102-5 | Tab.2, pp.790-1 |
| 1942 | Stadnik 1946 | Tab.99, p. 229 |
| 1946 | Zprávy státního úřadu statistického XIX (1948), 11-3 | Tab.3, pp. 68-9 |

## The socialist period

Top incomes for the socialist Czechoslovak are estimated from the Czechoslovak Microcensus (Atkinson and Micklewright 1992, p. 248), the official household budget survey of the Czechoslovak Statistical Office. The income concept is net income. The observation unit is household. We take the total population and the total income from the survey. To arrive at the percentiles of interest, we apply generalized Pareto curves techniques (Blanchet, Fournier and Piketty 2017).

In addition, we use Enterprise census as an alternative source to construct top income shares. The basic assumption behind this approach is that top earners in the wage distribution and in the income distribution overlap. Enterprise census in Czechoslovakia covered all workers in the socialist sector, while excluding employees of the Communist Party, of the Army, as well as employees in agricultural cooperatives (Atkinson and Micklewright 1992, p. 248). Income definition refers to monthly gross earnings. Survey took no annual bonuses into account (Atkinson and Micklewright 1992, p. 248). In order to arrive at annual income in each bracket, we multiply it with 13, accounting in addition for one yearly bonus. The number of individuals in the bracket is multiplied by the mid-value of the bracket. Top bracket is assumed to be Paretian (the same assumption was made by Atkinson and Micklewright 1992).[98] The total control income is taken as the sum of wages and salaries, employers social security contributions, income from agricultural cooperatives, income from private plot, other income from work, interest receipts, pensions and other social benefits. The data for specific years are found in *Historicka Ročenka* 1985, p. 350.

## The Czech Republic, 2005-2015

The data used to construct top income shares come from the statistics of the 'Natural person income tax from tax returns' (Daň z příjmů fyzických osob podávajících daňové přiznání) published annually by the Czech Ministry of Finance and made available on its official website. The data come in the form of tabulations organized by income ranges (the number of brackets is around forty) containing the number of tax returns with the corresponding income, including the breakdown by specific income sources (the 'particular tax base'), personal deductions, and tax payable.

The available statistics do not include taxpayers whose tax obligation has been settled by their employer(s) (which the law allows only in the case when taxpayers have obtained income exclusively from employment), or for that matter for any income for which the tax is withheld at source. Unfortunately, to our knowledge, the statistics for the withholding payroll tax of 'Natural person income tax from employment' (Daň z příjmů fyzických osob – závislá činnost) has not been published. Our working assumption is that top income groups generally file tax returns. Even if an individual is not required by law to submit the tax return (for example, if the individual obtains only income whose tax liability is settled by withholding tax agent, and thus considered

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[98] One should be aware that this is open to criticism (e.g. see Lydall (1968, p. 130) who points to strong deviation from Pareto law for top incomes especially in contemporaneous communist countries.

as final), it needs to file a tax return in order to claim available personal deductions. It is reasonable to assume that high-income individuals have higher incentive to claim personal deductions (for example, for charitable contributions). For this reason we focus on top income groups in the tax data.

Income is defined as 'gross income' before personal deductions and taxes. It corresponds to the tax base (základ daně) as defined by the Personal Income Tax Act (tabulations are ranged by the level of the tax base), which equals the sum of partial tax bases from the following income sources (Radavan 2010, p. 12):

- Incomes from dependent activity (employment) and function benefits;
- Income from business and from other independent gainful activity;
- Capital property income;
- Rental income;
- Other income.

We need to distinguish two periods when analysing the available statistics, before and after the comprehensive reform of the personal income tax in 2008. Before the reform, the partial tax base from employment was 'net wage or salary', that is, the gross wage (after employers' social contributions) reduced by social and health insurance contributions paid by the employee (in total 12.5 per cent of gross wage)[99]. Equally, in order to obtain partial tax base from the business activity, social and health insurance contributions paid by entrepreneurs and self-employed were recognized as business expenses. Business expenses (expenses incurred to generate, assure and maintain income) are estimated either as the actual expenses incurred, or using prescribed lump-sum proportion of revenues (e.g., 80% of revenue from agricultural production, forestry and fishery; 60% from business activity; 40% from self-employment, etc.).

In 2008 a major tax reform took place when progressive tax schedule was replaced by the flat rate of 15 per cent. After the reform, social and health insurance contributions paid by employee are no longer tax-deductible. Moreover, social and health insurance contributions paid by employer are included in the tax base from employment as well, in what has been commonly referred to as the 'super gross wage'. In addition, a maximum contributory base for social insurance was introduced and set to 48 times of average monthly wage.

Social benefits received by households are in general exempted from the personal income tax. Most importantly, pensions are tax exempt up to 198,000 CZK per year (162,000 CZK before 2008), and taxed only for the amount exceeding this threshold under the partial tax base of 'other income'.

For years from 2008 onwards, we construct series that both include and exclude employer's social security contributions in the income concept used after 2008. The published tabulations

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[99]Social security contributions paid by employee make in total 12,5% of the gross wage, of which social insurance account for 8% (pension isurance 6,5%, unemployment  insurance 0,4% and sickness insurance 1,1%) and health insurance for 4,5% of the gross wage.

give us the amount of employers' social contributions in a separate column. For the series that exclude employers' social security contributions ('adjusted' series), we adjust the raw series from 2008 onwards by subtracting employers' social contributions from the partial tax base from employment and adjust bracket thresholds downwards by the mean employers' contributions for the specific bracket. The employers' social security contributions account for as much as 34 per cent of the gross wage.[100] A cap on the social insurance contributory base reduces the importance of social insurance in income as one moves upward the distribution. Thus, the proportion of employers' social contributions falls from almost 20% of the corresponding total tax base in brackets as one enters the top percentile to 2% of the tax base (or 4% of the income from employment) for the top bracket. In practice, this adjustment might lead to the re-ranking of taxpayers. It is difficult to say with certainty how this has biased our results without having the insight into the income tax micro-data. As a consequence, we prefer the series before

Taxpayers are required to report only a portion of capital income in their tax return under the partial tax base from capital (such as interests on bank deposits for business purpose and interests on given loans, credits, bills of exchange, as well as capital income received from abroad), since a large part of capital income (dividends, interest on private deposits, on bonds etc.) is subject to withholding tax at source. Consequently, the available tabulations used in the analysis do not include a substantial part of capital income received by private taxpayers.

Capital gains are taxable under the partial tax base of 'other income' in the tax return. However, there are many exemptions available. Notably, capital gains on the sale of securities are tax exempt if the holding period of a security has exceeded minimally 6 moths and if the ownership share has been less than 5% of the company's capital in the period of 24 moths before the disposal (in opposite, capital gains are tax exempt only if the holding period of securities exceeds at least 3 years). Capital gains on the sale of the ownership share in limited liability company or partnership is tax exempt if it has been held for more than 5 years. Capital gains on the sale of business property are exempt if individual has held it for more than five years (or two years if this has been individual's principal residence).

In general, we would like to construct series that both include and exclude capital gains, since realized capital gains might often cause significant short-term volatility in comparison to other, more stable, annual income sources, especially due to the lumpiness of its realization which is often affected by non-economic factors (quite often by tax legislation changes) (Piketty and Saez 2003). Unfortunately, available tabulations do not provide amounts of realized capital gains separately, which is the reason why we produce only series keeping non-exempt realized capital gains in our income concept.

However, we can make a simple exercise in order to account for the importance of realized capital gain component in our top shares estimates. First, the realized capital gains are taxed under the partial tax base of 'other income', and we can thus make a simple check by looking at the importance of 'other income' component for various top income groups. Even if it is assumed

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[100]Social insurance accounts for 26% of the gross wage (pension isurance 21,5%, unemployment insurance 1,2% and sickness ineurance 2,3%) and health insurance for 9% of the gross wage.

that the total 'other income' actually refers to realized capital gains (which might not be very far from the truth for the groups at the very top)[101], then still capital gains would account for a quite small proportion of income obtained by the top income groups. For example, thus defined realized capital gains (the upper bound) make only 5 per cent of the total income of P99.9-100. Hence, if we subtract 'other income' component in full from our top share estimates (including capital gains), then P99.9-100 income share would fall in 2008 from 5,24 per cent to 4,95 per cent. For lower groups within the top percentile, the fall is quite negligible. For example, for P99-99.5 the exclusion of other incomes results in the fall in 2008 from 2,46 per cent to 2,40 per cent. In general, we can be assured that the presence of the limited part of non-exempt realized capital gains does not affect our estimates in any significant way.

## A.2. Estimation procedure, 2005-2015

One of the main goals of this work is to provide a more reliable picture of the top of the income distribution. It has been found that the income tax data are more trustworthy source to capture the top of the distribution than the household budget surveys, dominantly used in the distributional analysis (see Novokmet 2017, chapters on Poland, Croatia and Slovenia). Moreover, by failing to notice the true development at the top, one can overlook the development in the overall inequality (Piketty and Saez 2003, Saez and Vaell 2004). However, the use of the income tax data is not without drawbacks. One should bear in mind that the income tax data, as a general rule, have been prepared and published for reasons not related to the distributional analysis. In this respect, the income tax data for the Czech Republic is an illustrative example of various difficulties in the application of the tax data for this particular purpose. One important reason is legislative changes (e.g. Burkhauser et al. 2015). As we shall see, tax reform in 2008 induced substantial reaction in the taxpayers' reporting behaviour.

### The option of joint filling

One mechanism that could partly explain the observed increase in 2008, especially concerning the rise of reported income from employment, could be elimination of the joint filling of married couples. In 2005 an option of common taxation of married couples (with at least one child) was introduced. This option was abolished in 2008 as the progressive schedule was abolished (and disappeared the potential benefits of income splitting to reduce the tax burden). It is fairly plausible that those eligible at the top of income distribution substantially reduced their reported tax base by filing jointly with their low-income spouse, where each spouse declared (and was taxed accordingly) the half of their total income.

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[101] Other incomes include besides realized capital gains most importantly: income from occasional activities or occasional lease of movable assets; winnings in lotteries, betting and other games of chance; prizes from public competitions and sporting competitions, etc. (Karavan 2010, p.15)

According to reports of the Czech tax administration, the number of tax returns jumped by a third in 2005 primarily due to the introduction of joint filing (Annual Report 2006, pp. 19-20) suggesting that many eligible taxpayers "relocated a settlement of their tax obligation from their employers to themselves" (Annual Report 2006, p.21)[102]. Common taxation of spouses was widely used during the applicable period. For example, around 40% of tax returns in 2007 used this option, mainly by those obtaining income from employment (70% of tax returns using common taxation option, while the remaining 30% were used by entrepreneurs and self-employed (*Informace o činnosti daňové správy České republiky za rok 2008*, p. 12-3)).

The proportion of taxpayers filling tax return in the total tax units was substantially higher in the years when joint taxation of married couples was in force.[103] Unfortunately, there are no available tabulations for 2004 and earlier years which would be more revealing in order to ascertain the importance of joint filling for the reported incomes at the top. Similarly, it is difficult to speculate whether a relatively higher use of the common taxation option could point to higher intra-household income inequality in the Czech Republic, and thus could stand in contrast to observed trend of rising correlation between spouses' earnings at the top of distribution ('rich marrying rich') which has been exacerbating overall inequality among households in the US (for example the 'assortative mating' along earnings (e.g. Schwartz 2010)). Kalíšková (2014) finds that the introduction of common taxation in the Czech Republic primarily negatively affected married women employment decisions, while Mysíková finds higher within-couple inequality in the Czech Republic than in other former transition countries.

### Estimation procedure for 2005-2007: the combination of EU-SILC and income tax data

For the period when the option of joint filing was applicable, and by most accounts, widely used, we estimate top shares combining the survey data, namely EU-SILC, and income tax data. First, we estimate equal-split distribution of the 'net income' (after social security contributions, see above) from the survey. We have assumed that survey is representative up to 90th percentile (p0=0.9) and that the tax data is representative p=0.999, since here and above, the tax data strongly 'beat' the survey (for example, for p=0.99-0.991 the ratio between mean income is only 1.09). We believe this is due to the fact that probability of claiming itemized deductions (which then compel the taxpayer to submit the return even though she obtains only income from employment) rises with income rank, and the proportion is substantial for higher groups within the top percentile. We have then applied piecewise-linear correction factors from p0=0.9 up to p0=0.995 and generalized Pareto interpolation techniques (Blanchet, Fournier and Piketty 2017) to produce the corrected distribution. For more details, see chapter 6.

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[102] The Annual Report of the Czech Tax Administration (*Výroční zpráva české daňové správy*), The Central Financial and Tax Directorate

[103] Thus, in accordance with this interpretation, an important reason behind a fall in the proportion of tax returns in the total tax units from 2008 onwards would be caused by the reallocation of tax settlement of many taxpayers (that had been eligible to common taxation of married coupes) back to their employers.

## The flat tax reform in 2008

It has been noted already that the comprehensive reform of the income tax in 2008 might have induced important changes in the reporting behaviour of taxpayers. The main explanation behind the sudden increase reported incomes in 2008 could be sought in behavioural responses induced by the replacement of progressive schedule by the flat tax regime. The fall in marginal top rates could in theory lead to an increase of reported income to the tax administration, either by reducing tax evasion/avoidance or by increasing real economic activity ('supply-side' response) (e.g. on elasticity of taxable income see Feldstein 1999; Gruber and Saez 2002; Saez, Slemrod and Giertz 2012). This, and especially the former channel, has been proposed for some other countries in Central and Eastern Europe that introduced flat tax rates (e.g. Gorodnichenko, Martinez-Vazquez and Peter (2009) in Russia, or Kopczuk (2012) in particular for the 'business' income in Poland).

More importantly, along this line of reasoning, the observed rise in reported income in 2008 might be explained by income shifting from corporate to personal tax base due to the existing gap between the respective tax rates. An incentive for shifting taxable income towards personal tax base was created by the comprehensive reform of the personal income tax system in 2008, when the progressive schedule (with four marginal tax rates: 12, 19, 25 and 35 per cent) was replaced by the linear rate of 15 per cent. On the other hand, the corporate income tax rate was reduced 'only' from 24 to 21 per cent (it is 19 per cent in 2014). In practice, there are numerous potential ways how taxable income could be shifted form corporate to personal tax base (and vice versa), and some of them were examined in a considerable detail by Gordon and Slemrod (1998), such as increasing corporate debt financing, altering between incorporated and unincorporated legal status, or changing remuneration modes for employees, among others.

By looking at these in more detail could be especially useful in order to better apprehend the break caused by the tax reform in the Czech tax statistics in 2008. In the first place, it has been found in the literature that a prompt response to tax incentives in general (and thus in the form of income shifting between corporate and personal tax base) has been mostly a practice of the very high-income individuals, who show much higher overall elasticity of taxable income (Saez 2004, Gruber and Saez 2002). This seems to have also been the case in the Czech Republic recently where the rise in reported income has come mostly from the very top income groups. We have constructed for this purpose homogenous series for the top 1 per cent,[104] and it can be discerned from Figure, which shows the evolution of income shares of three constituent groups of the top 1 per cent (top 1-0.5%, 0.5-0.1% and 0.1%), that the 2008 rise was dominantly induced by the top 0.1 per cent group.

Business income is especially sensitive to tax incentives of this sort (note that business income had to be declared on the tax return both in pre-reform and post-reform years, and therefore it is not related to filing a tax return to claim personal deductions). Smaller businesses are relatively

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[104] Namely, we have used the gross wage concept for 'the particular tax base from employment'. We have added to the tax base employees SSC before 2008, and excluded employer's SSC afterwards. The total income control is adjusted accordingly.

flexible with respect to the designated legal status. For example, a massive switch from incorporated to unincorporated status has been evidenced during the sequence of reductions of the top marginal income tax rates throughout the 1980s in the US (Slemrod 1996, Gordon and Slemrod 1998, Saez 2004). Accordingly, a considerable part of the documented rise of reported income after the reforms was caused by the sudden increase of business income of unincorporated entities (more precisely, of S-corporations after the 1986 tax reform; see Saez 2004).[105] We find a stronger increase in business income in the Czech Republic following the 2008 reform, which was plausibly induced in part by the one-time change of the corporate status as an immediate response to lower personal income tax rate relative to corporate income tax rate.[106]

Further, we find a substantial rise of reported capital income. Capital income required to be reported on the tax return consists primarily of interests on given loans/credits and interests on deposits for business purposes. In this respect, an abrupt rise in capital income component for the top groups could be explained as a move towards higher use of debt financing of corporations (and away from equity). Since interest payments are deductible from the corporate income tax base, a potential in reducing an overall tax burden becomes more apparent as the corresponding increase of interests on given loans and credits for private individuals is taxed at the lower tax rate (Gordon and Slemrod 1998, p. 4). Certainly, the benefits of debt tax shield are all too familiar to entrepreneurs and their tax advisors, as it has been one of the most researched issues in the corporate finance since the seminal propositions of Modigliani and Miller.

Finally, an equally prominent rise in wage income component documented in Figure A2 is also examined in the light of these theories. The most straightforward example of shifting labour income is in the case of incorporated business owners who can simply optimize between corporate and personal tax base by choosing whether to pay cash salaries to themselves (which are taxed as personal income; and thus lower corporate tax base by expensing these) or to keep most of profits in the firm as retained earnings (Gordon and Slemrod, p. 6-7; on the fuzzy frontier between labour and capital income see Piketty and Saez 2012). In a similar manner, a shift from employee stock options to more traditional forms of personal remuneration (salaries and wages, bonuses) could account for the observed overall rise in personal income from employment.

## A.3. Total control for population

In order to estimate the control total for population, the first step is to define the tax unit (household or individual). For years 1898-1918 tax unit has been household, which the tax law

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[105]Related to this, Gordon and Slemrod (1998, p. 3) refer to the research which finds that following the 1986 tax reform there is no clear evidence of increased economic activity or higher compliance through reduced evasion.

[106] As a reminder, proprietors subject to personal income tax are liable to tax with their total profit, whether retained in the business or withdrawn.

defined as the married couple and dependants. Consequently, we estimate the total number of households in the country as the number of adults (above 20 years of age) minus the number of married females (the assumption is that the number of non-adults that filled the tax returns separately was negligible). The data come from censuses held in Austria-Hungary in 1890, 1900 and 1910:

− *Die Ergebnisse der Volkszählung vom 31. December 1890 in den im Reichsrathe vertretenen Königreichen und Ländern*
− *Die Ergebnisse der Volkszählung vom 31. December 1900 in den im Reichsrathe vertretenen Königreichen und Ländern*
− *Die Ergebnisse der Volkszählung vom 31. Dezember 1910 in den im Reichsrate vertretenen Königreichen und Ländern*

The tax unit in interwar Czechoslovakia was household (or family) (Novotny 1937, pp. 35-7). The total income of the household was attributed for the tax purpose to the head of the family (*hlava rodiny*). This applied, as a general rule, to the husband/father, defining in turn the wife and children as the household members (*příslušníky domácnosti*). Adult children were not recognized as the members of the household for the tax purposes, even if they lived in the same household with the head of the family (Novotny 1938, p. 37; *Státní úřad statistický 1935, p.14*). Bachelors and widows/widowers represented a separate tax unit. Equally as for the Habsburg era, we estimate the total number of households in the country as the number of adults minus the number of married females. The data are found in population censuses that took place in 1921 and 1930, as well as in reports on the *Movement of population*:

− *Sčítání lidu v Republice československé ze dne 15. února 1921*; Praha, Státní úřad statistický 1924-1927.
− *Sčítání v Republice československé ze dne 1. prosince 1930;* Praha, Státní úřad statistický 1934-1938

Estimates for the years between censuses are derived as follows. The proportion of adults to the total population and the proportion of married females in adult population are linearly interpolated between the census years and applied to number of total population from the official reports in the *Movement of Population*.[107]

The income tax data from 1938 to 1942 refer to the taxpayers in the territory of the so-called Protectorate of Bohemia and Moravia. The population control is accordingly adjusted. The number of adults (20+) is found in:

− *Mitteilungen des Statistischen Zentralamtes des Protektorats Böhmen und Mähren (Zprávy Ústředního statistického úřadu, Protektorát Čechy a Morava) 1944, 27-9.*

The proportion of married women is taken from the 1930 census (the above source gives the number of married women for the territory that eventually formed the Protectorate). Finally, we apply the proportion of adults and the proportion of married females to the estimates of the total

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[107] The use of linear interpolation (for proportion of adults in total population between census years) should not bias estimates. For example, the linear interpolation of the number of total population between the census years gives closely the same number as found in the annual reports of the *Movement of Population*.

population in the Protectorate from 1938-1944 (*Statistisches Jahrbuch für das Protektorat Böhmen und Mähren* 1941-1944; Krejči 1986)

For 1946, population control is estimated from the *Soupisy obyvatelstva v Československu v letech* 1946-1947.

Finally, the tax unit in the Czech Republic is individual. Hence, as our control total for population we take the number of adults aged 20 and above. These figures come from the population statistics of the Czech Statistical Office.

### Table A3: Population and income control total

| Year | Total tax units | | Total income (mill.current units) | Year | Total tax units | | Total income (mill.current units) |
|------|-----------------|---|-----------------------------------|------|-----------------|---|-----------------------------------|
| 1897 | 3.452.449 | * | 2.576 | 1927 | 6.157.949 | ** | 54.065 |
| 1898 | 3.465.257 | * | 2.689 | 1928 | 6.248.118 | ** | 57.272 |
| 1899 | 3.478.064 | * | 2.849 | 1930 | 6.428.458 | ** | 55.935 |
| 1900 | 3.490.872 | * | 2.849 | 1932 | 6.517.747 | ** | 48.763 |
| 1901 | 3.515.280 | * | 2.781 | 1933 | 6.557.448 | ** | 45.598 |
| 1902 | 3.539.687 | * | 2.743 | 1934 | 6.592.406 | ** | 43.128 |
| 1903 | 3.564.095 | * | 2.801 | 1936 | 6.649.354 | ** | 46.023 |
| 1904 | 3.588.503 | * | 2.901 | 1938 | 3.463.362 | *** | 28.557 |
| 1905 | 3.612.911 | * | 2.970 | 1940 | 3.540.410 | *** | 34.125 |
| 1906 | 3.637.318 | * | 3.088 | 1942 | 3.475.526 | *** | 42.863 |
| 1907 | 3.661.726 | * | 3.262 | 1946 | 5.024.618 | ** | 118.821 |
| 1908 | 3.686.134 | * | 3.438 | | | | |
| 1909 | 3.710.541 | * | 3.554 | 2005 | 8.053.497 | * | 943.614 |
| 1910 | 3.734.949 | * | 3.790 | 2006 | 8.114.835 | * | 1.016.036 |
| 1911 | 3.760.713 | * | 4.053 | 2007 | 8.189.779 | * | 1.068.396 |
| 1912 | 3.780.225 | * | 4.374 | 2008 | 8.299.282 | * | 1.117.857 |
| 1913 | 3.797.573 | * | 4.708 | 2009 | 8.368.944 | * | 1.190.492 |
| 1914 | 3.817.691 | * | 4.948 | 2010 | 8.400.320 | * | 1.244.317 |
| 1915 | 3.849.467 | * | 6.402 | 2011 | 8.393.932 | * | 1.317.625 |
| 1916 | 3.830.355 | * | 8.597 | 2012 | 8.426.179 | * | 1.392.035 |
| 1917 | 3.798.453 | * | 10.761 | 2013 | 8.441.222 | * | 1.468.034 |
| | | | | 2014 | 8.465.034 | * | 1.506.538 |
| | | | | 2015 | 8.479.640 | * | 1.513.855 |

Note: * Czech Lands (1897-1917); Czech Republic (2005-2015); ** Czechoslovakia; *** Protectorate of Bohemia and Moravia

# A.4. The control total for income

<u>Habsburg period, 1898-1918</u>

The control total for income for the Habsburg era was derived as follows. We take as our starting point Schulze's (2007) estimates of regional GDP in Austria-Hungary. Schulze provides estimates for 1870, 1880, 1890, 1900 and 1910, expressed in 1990 Geary-Khamis international dollars. In order to convert estimates for Bohemia, Moravia and Silesia into current Austrian-Hungarian crowns we take the following steps. First, we convert these estimates to 1913 crowns by applying the exchange rate Schulze used (namely 3.36 GK dollars per crown; see Schulze 1997, p. 14). To obtain GDP for other years (for those between 1890, 1900 and 1910), we apply real growth rates of GDP for Bohemia, Moravia and Silesia taken from Ciccareli and Missiaia (2014). Next, nominal values were obtained by using regional living cost indices in Austria-Hungary estimated by Cvrcek (2014). Finally, we take 55 per cent of nominal GDP as our total control income.

Needles to say, this approach could entail the significant margin of error and the obtained estimates should be rather seen as reasonable approximations of the total income. We take as the income control for the year *t* as the average of income for three years (t, t-1, t-2) in order to smooth the series as they show substantial fluctuation, as well as due to the fact that taxable income was estimated as the average income from the three preceding years (see section A.1).

For years 1914-18 we use the 'top-bottom' approach (Atkinson 2007) to estimate total income denominator. Namely, we start from the total reported income of filers and estimate the remaining income of non-filers. For years 1898 until 1913, we can estimate the total income of non-filers as the difference between the total control income (estimated as described above) and the total income of filers. Thus obtained average income of non-filers results in on average in 20 per cent of the mean income of filers. We simply apply this proportion to 1914 and 1915, while we take it to be 25 per cent in 1916, 30 per cent in 1917 and 35 per cent for 1918. The decision to increase is largely discretionary, in order to obtain the lower bound, as well to due to increase in tax-filers due to wartime inflation from 1916.

We take this approach rather than starting from Schulze's (2005 , Tab. 3.8) estimate of real GDP in 1914-18 in 1913 prices for the whole territory of Cisleithania (for example, by assuming the same growth rates after 1913), because we lack regional estimates of GDP and, more importantly, reliable regional price indices. In the midst of wartime inflation it is plausible to assume that this approach would result in highly unreliable estimates.

<u>Interwar period</u>

For the total income of Czechoslovakia, we take as our departing point estimates of GDP by Pryor et al. (1971). But one should point to the lack of consensus regarding this estimate among the leading experts in the field. Less controversy is on the share of personal income in total

income (since Czechoslovakia had large corporate as well as public sector, which was quite similar to western countries), and more on the order of magnitude of GDP itself.

Namely, Jaroslav Krejči (1968) made also national income estimates in the interwar period, and even though the index of the GDP development in constant prices is quite similar in Krejči (1968) and Pryor et al. (1971), the difference for GDP at market prices for base year 1929 is non-negligible. The difference is quite substantial amounting to 20 billion Kč in 1929 (Pryor et al 73,4 bill Kč, while Krejči's 93,4 bill Kč). The debate ensued between Krejči and Milos Stadnik. Krejči's estimates were criticized by Stadnik in Pryor et al. (1971) and Stadnik (1972), to which Krejči (1972) responded. Here, we take as our guide the 'international blessing' of Angus Maddison, who included Pryor et al. (1971) estimates in his database (see Mitchell as well), which have become standard for studies on the interwar Czechoslovakia (see for example Broadberry and Klein 2011).

However, in order to estimate GDP in current prices we 'reflate' Pryor et al. (1971) estimates by implicit GDP deflator of Krejči (1968), which is available for 1930-1937. For 1926 and 1927, we reflated Pryor et al. figures of GDP in constant prices by taking two-thirds of living cost index and one-third of the wholesale price index (Teichova 1988, p. 18). With respect to the proportion of total household income (in accordance to the definition of income as defined by the tax law) we take it as 80 per cent of GDP.

Pryor et al. (1971) series ends in 1937, so it cannot be used as a starting point for 1942, which refers to the Protectorate of Bohemia and Moravia. For 1942 we take the following approach. Stadnik (1946) in his pioneering research estimated interwar national income (corresponding roughly to net domestic income at factor prices) for Czechoslovakia, including the Protectorate. We take the total control income as 75 per cent of this estimate, which is the average proportion in which our total control income takes from Pryor et al estimate for 1929-37

## 2005-2015

We use national accounts in order to arrive at the total income denominator. This measure should ideally correspond to "the total income that would have been reported if everybody had been required to file a tax return" (Atkinson 2007, p. 29). We start from the series for the primary income of the household sector from which we subtract and add items to approach the aggregate that corresponds as closely to our definition of income reported in the tax statistics.
We differentiate between 'adjusted' and 'non-adjusted' series. The 'adjusted' refers to the series for which we adjust our income concept in the raw data by adding social security contributions paid by employees for 2005-7 (when income from employment was defined as net wage) and by subtracting social security contributions paid by employers from 2008 onwards (when income from employment was defined as 'super-gross wage'). When we speak of the 'non-adjusted' series we refer to the series where income from employment corresponds to the legal definition and as it is presented in the tabulations.
        The control total for ('non-adjusted') income for 2008 – 2015 has been estimated as:

      Balance of primary incomes for the household sector (net)
-     Imputed rent of owner-occupiers
-     20% of Households' actual social contributions
+     50% of Social security pension benefits in cash
-     50% of Interests and Dividends received by the household sector
-     Other investment income

We do not subtract 'Employer's actual social contributions' from the 'balance of primary incomes' as these are part of 'super gross wage', which makes the partial tax base from employment. Yet, we do not subtract all 'household social contributions', which comprise in addition to employees' SSC, also social contribution paid by entrepreneurs and self-employed which have been still
As already mentioned above, the tax reform in 2008 led to important changes in the definition of the tax base, most importantly, in a switch from the 'net wage' to 'super gross wage' in defining the partial tax base from employment. Thus, for the adjusted series after 2008, where we excluded employers' social security contributions in the raw data, we add employees' social security contributions to the above-defined total control for income. Equally, for adjustment of the series in 2005-2007, we add employees' social security contributions.

For the ('non-adjusted') series that include employer's social contributions in income concept, we add both Employers' actual social contributions and Households' actual social contributions. National accounts series are found in the Database of National Account of the Czech Statistical Office (CZSO). The ESA 2010 version has been used.

Interpolation

The income tax data come in the tabulation form, ranged according to income thresholds of the progressive tax schedule. Therefore, in order to estimate shares for the specific percentiles of interest, such as the top 1 per cent, we interpolate by assuming the Pareto distribution for top incomes. Here we follow the well-established empirical observation that the upper tail of the income distribution is approximately Pareto in form.
More specifically, cumulative distribution function $F(y)$ for income $y$ is given by $1 - F(y) = (k/y)^a$, where $1 - F(y)$ is the proportion of individuals with income above $y$, and with $k$ and $a$ constant. One then finds that the ratio between the average income $y^*(y)$ above the certain threshold $y$ and the threshold $y$ is constant. This constant is often referred as the inverted Pareto coefficient $b = y^*(y)/y$ (equally $b = a/(a - 1)$). Percentile thresholds and average income can then be easily obtained for the specific top income groups (Piketty 2007, Atkinson 2007a).

Top Earnings (Figure 17)

The total number of employees used as a population denominator is taken from the Stadnik (1946) and Historicka Ročenka (1985). The total amount of salaries and wages is taken from Stadnik (1946, pp. 180-1). As discussed in more detail above, Krejči's series do not differ from Stadnik's regarding the national aggregates for wages and salaries, and these amounts should

be seen as quite reliable (actually, both authors constructed them on the basis of social security statistics). We arrive at the top percentile income share by using Pareto interpolation.

## EU-SILC

To allow comparability with the tax-based estimates, we take adults as the unit of observation, while the total income is taken from the survey, which should be representative for the whole population. In addition, as property income is only available at the household level, we impute it to the highest income earner in the household. Thus, this refers to the upper bound.

**Table : Top income shares (in %),**

|      | Top 10% | Top 5% | Top 1% | Top 0.5% | Top 0.1% | Top10-5% | Top 5-1% | Top 1-0.5% | Top 0.5-0.1% | Top 0.1% |
|------|---------|--------|--------|----------|----------|----------|----------|------------|--------------|----------|
| 2005 | 31,2    | 20,5   | 8,1    | 5,4      | 2,1      | 10,8     | 12,4     | 2,6        | 3,3          | 2,1      |
| 2006 | 31,2    | 20,4   | 7,9    | 5,2      | 1,6      | 10,8     | 12,5     | 2,7        | 3,7          | 1,6      |
| 2007 | 31,0    | 20,3   | 7,7    | 5,0      | 1,7      | 10,8     | 12,5     | 2,7        | 3,3          | 1,7      |
| 2008 | 30,7    | 20,0   | 7,5    | 4,9      | 1,6      | 10,7     | 12,5     | 2,6        | 3,3          | 1,6      |
| 2009 | 30,3    | 19,7   | 7,6    | 5,1      | 1,3      | 10,7     | 12,0     | 2,6        | 3,8          | 1,3      |
| 2010 | 30,1    | 19,4   | 7,2    | 4,7      | 1,4      | 10,8     | 12,2     | 2,5        | 3,3          | 1,4      |
| 2011 | 30,1    | 19,2   | 6,7    | 4,1      | 1,1      | 10,9     | 12,6     | 2,6        | 3,0          | 1,1      |
| 2012 | 29,9    | 19,1   | 6,7    | 4,1      | 1,1      | 10,8     | 12,4     | 2,6        | 3,0          | 1,1      |
| 2013 | 29,8    | 19,0   | 6,5    | 3,9      | 1,0      | 10,8     | 12,5     | 2,5        | 2,9          | 1,0      |

Table A4: Top income shares from EU-SILC based on gross income (after social security contributions paid by employer)
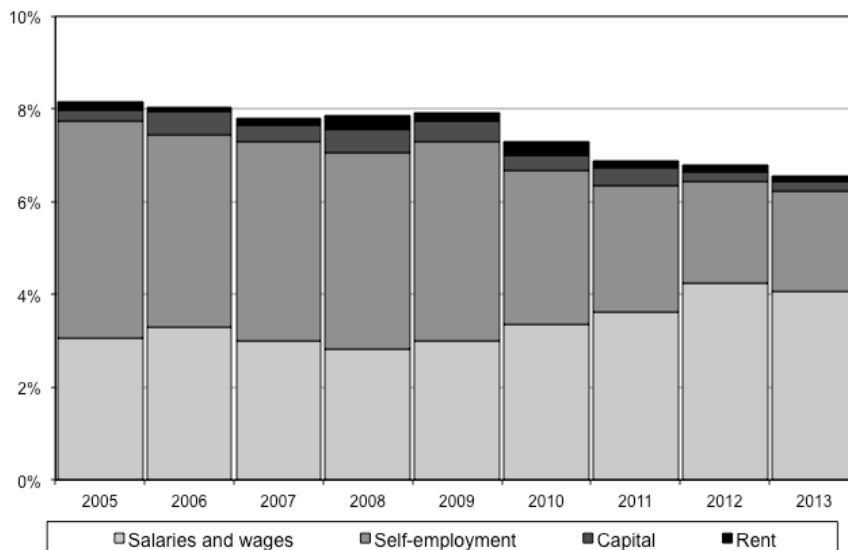


Figure A1: Top 1 per cent composition in EU-SILC
Note: it refers to gross income (after employer SSC)

# A.5. Wealth distribution

<u>Wealth tax in Czechoslovakia, 1919</u>

The 1919 wealth tax was a one-time levy introduced to finance the withdrawal of the Austrian-Hungarian krone by paying off the Austrian-Hungarian National Bank. Accordingly, an exhaustive census of all existing wealth on 1 March 1919 was carried out. The examination lasted until August 1919 and the law regulating the wealth tax was finally passed on 8 March 1920 (Rašin 1923, p. 49). The subject of the tax was twofold: the net wealth (gross assets after subtraction of debt), and the wealth increment between 1914 and 1919. Wealth was defined as including all real and financial property, while excluded were consumer durables and other objects for personal use, pension rights and undue claims on life insurance less than 4,000 Kč (Rašin 1923, pp. 50-1). The valuation was made according to the market value. The tax was progressive, with rates climbing from 1 to 30 per cent.

Exempt from tax was wealth of foreign heads of states and diplomatic representatives, as well as wealth of non-profit institutions serving the public purpose. Most importantly, wealth below 10,000 Kč was tax-exempt (Rašin 1923, p. 50).
Fortunately, the statistics reports the total estimated wealth, including that below 10,000 Kč (namely, only 0.12 per cent of reported households with property were subject to wealth tax). The corresponding figure is taken as the total wealth denominator used to calculate top wealth shares. The tax unit was household, and we use the total number of adults minus the number of married females as the total population control. Since the statistics reports all tax units with positive wealth, the difference between this number and our total control for population accounts for households with zero wealth.

Wealth was classified into four categories (Horvath 1935, p. 14): (i) agricultural (and forest) wealth; (ii) residential wealth; (iii) business wealth; and (iv) financial and other wealth. Tabulations report for each bracket the corresponding amount of the mentioned asset category together with the total liability. As stated above, the wealth increment between 1914 and 1919 was also subject to the tax (it was primarily aimed to target war profiteers (Rašin 1923)). The statistics thus reports tabulations for 1914, but including only those taxpayers present in the statistics for 1919. Consequently, we do not use the existing reports to estimate the wealth distribution in 1914.
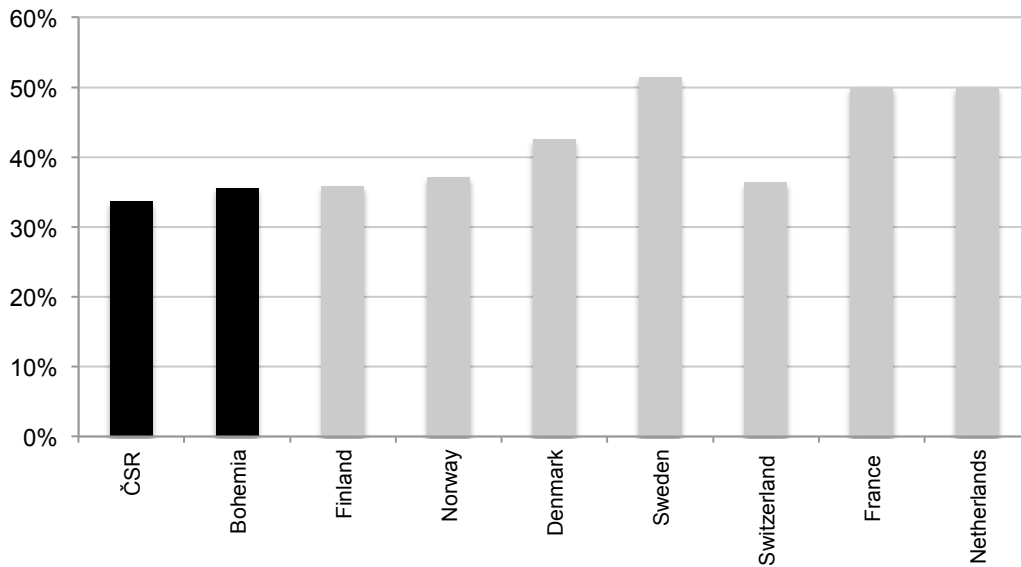
Figure A2: Top 1 per cent wealth share in 1919
Source: author's computation from the wealth tax data; for other countries from Roine and Waldenstrom 2015 (we take the closest year to 1919)
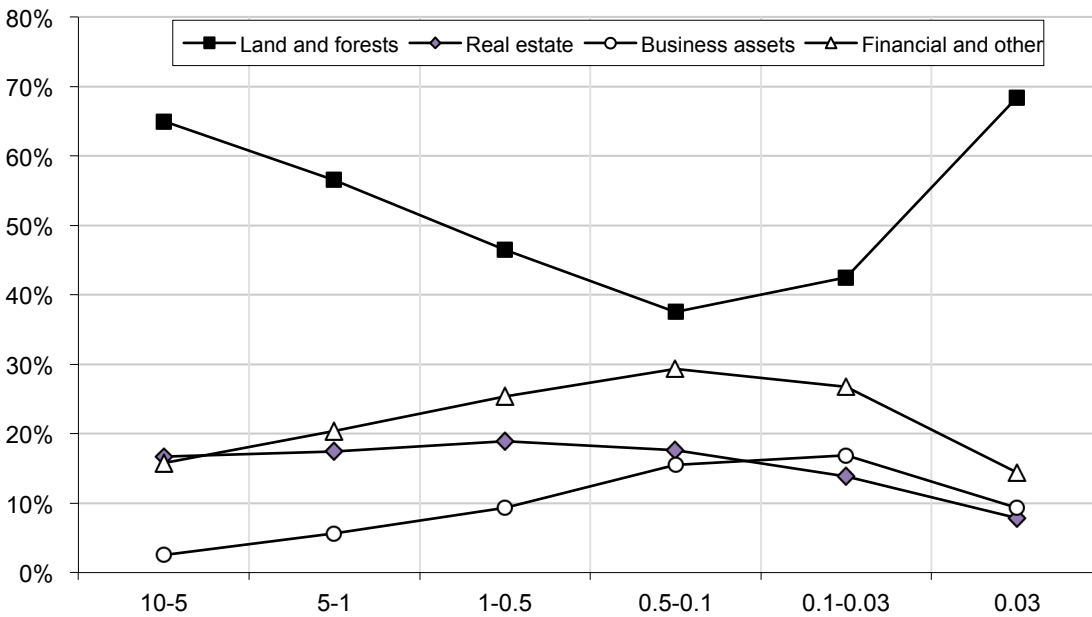


Figure A3: asset composition in Slovakia in 1919
Source: author's computation from the wealth tax data

Table A5. Large landholdings in Bohemia, 1913
Source: Sandgruber 1978

| Latifundia, above 10000 ha | Ha | Large landholdings from 5000-10000 ha | Ha |
|---|---|---|---|
| Adolf Josef Fürst Schwarzenberg | 176 000 | Marie Fürstin Hohenlohe-Kaunitz | 9-10 thd |
| Josef Fürst Colloredo-Mannsfeld | 58 000 | Alex. Joh. Prinz Thum und Taxis | |
| Adolf Graf Waldstein (1916) | 47 000 | Prämonstratenser-Stift Tepl | |
| Max Egon Fürst Fürstenberg | 40 000 | Johann Graf Palffy | |
| Johann Fürst Liechtenstein | 37 200 | Prämonstratenser-Stift Strahov | |
| Weil. Kaiser Franz Josef I. | 34 700 | Graf Kolowrat-Krakowskysehe Admin. | |
| Eugen Graf Czernin | 32 000 | Erwein Graf Schlik | |
| Franz Graf Clam-Gallas | 31 600 | Karl Fürst Clary-Aldringen | |
| Zdenko Ferd. Fürst Lobkowitz | 28 000 | Alex. Markgraf Pallavicini | 8–9thd |
| Karl Fürst Schwarzenberg | 28 000 | Phil. Ernst F. Hohenlohe Schillingsfürst | |
| Karl Fürst Kinsky | 25 500 | Maria Gräfin Nostitz-Rienek | |
| Karl Graf Buquoy | 25 000 | Karl Graf Schönbom | 7–8thd |
| Albert Fürst Thum und Taxis | 24 500 | Theobald Graf Czernin | |
| Erzbistum Prag | 23 000 | K.k. Theresianisches adeliges Damenstift | |
| Johann Graf Harrach | 20 000 | Erzherzog Ludwig Salvator | |
| Alfred Fürst Windisch-Grätz | 20 000 | Bohuslav Graf Kolowrat-Krakowsky | |
| Clemens Fürst Metternich | 20 000 | Richard Freih. Dräsche v. Wartinberg | |
| Franz Josef Fürst Auersperg | 19 000 | Hermann Freih. v. Königswarter | |
| Aloisia Gräfin Czernin | 17 600 | Heinrich Graf Clam-Martinitz | |
| Franz Graf Thun-Hohenstein | 17 600 | Johann Graf Hartig | 6–7thd |
| Karl Fürst Trauttmansdorff | 17 000 | Karl Freih. v. Lilgenau | |
| Zdenko Graf Kinsky | 14 700 | Emmerich Graf Chotek | |
| Wilhelm Fürst von Hohenzollern | 14 500 | Karl Friedr. Fürst Oettingen | |
| Karl Fürst Paar | 14 000 | Felix Freih. v. Aehrenthal | |
| Karl Fürst Löwenstein | 14 000 | Zisterzienserstift Hohenfurt | |
| Erwein Graf Nostitz-Rienek | 13 500 | Rudolf Fr. Freih. v. Geymüller | |
| Alain Fürst Rohan | 13 000 | Stadtgemeinde Ellbogen | 5– 6thd |
| Georg Fürst Lobkowicz | 12 600 | Malteser Ritterorden | |
| Weil. Erzherzog Franz Ferdinand | 12 600 | Nikolaus Graf Desfours-Walderode | |
| Fürstin Khevenhüller und Gräfin Festetits | 12 000 | Alois Graf Sternberg | |
| Heinrich Fürst Hanau | 12 000 | Otto Sigmd. Prinz Schönburg Waldenburg | |
| Gottfr. Prinz Hohenlohe-Langenburg | 11 000 | Rudolf Ferd. Graf Kinsky | |
| Metropolitankapitel St. Veit | 11 000 | Benediktinerstift St. Margareth | |
| Josef Oswald Graf Thun-Hohenstein | 10 400 | Oskar Freih. Parish v. Senftenberg | |
| Friedrich Herzog Beaufort-Spontin | 10 000 | V. und O. Danek Edle v. Esse | |
| Josef Graf Herberstein | 10 000 | | |
| Will.Karl Aug. Prinz zu Schaumburg-Lippe | 10 000 | | |
| Leopold Graf Sternberg | 10 000 | | |
| **TOTAL** | **946 400** | **TOTAL** | **268 300** |

Table A6. Large landholdings in Moravia and Silesia, 1913
Source: Sandgruber 1978

| Latifundia, above 10000 ha | Ha | Large landholdings from 5000-10000 ha | Ha |
|---|---|---|---|
| Moravia | | Moravia | |
| Johann II. Fürst von Liechtenstein | 109 000 | Osten. Verein f. Zellulosefabrikation | 8-10 thd. |
| Fürsterzbistum Olmütz | 36 600 | Alfred Graf Harrach | |
| Anton Dreher | 17 000 | Metropolitankapitel Olmütz | |
| Anton Graf Magnis | 14 000 | Gabriele Fürstin Hatzfeld-Wildenburg | |
| Hugo Fürst Salm-Reifferscheidt | 12 800 | Wladimir Graf Mittrowsky | 6-8 thd. |
| Gebrüder Thonet | 12 700 | Leopold Graf Berchtold | |
| Freih. de Forest | 12 700 | Ferdinand Graf Kinsky | |
| K.u.k. Familien-Fondsgüter | 11 500 | Alfons Graf Mensdorff- Pouilly | |
| Heinrich Graf Haugwitz | 11 500 | Damenstift Maria Schul, Brünn | |
| Emanuel F. Collalto et S. Salvatore | 10 800 | Rudolf Graf Wrbna-Kaunitz | |
| Hoch- und Erzstift Olmütz | 10 500 | Franz Graf Seilern-Aspang | |
| Alois Gr.Podstatzky-Liechtenstein | 10 400 | Erzherzog Friedrich | |
| Deutscher Ritterorden | 10 000 | Franz Graf Hanach | |
| Wenzel Graf Kaunitz | 10 000 | Adolar Graf Karatsonyi | |
| | | Franz Freih. V. Wiesenberg | |
| | | Alois Prinz Liechtenstein | |
| | | F. Khevenhüller und Gräfin Festetits | |
| | | Friedrich Graf Chorinsky | |
| | | Luitgarde Gräfin Stadnicki | 5- 6 thd. |
| | | Gräf. Reichenbach und Pr. Löwenstein | |
| | | Landeshauptstadt Brünn | |
| | | A. und M. Baltazzi | |
| TOTAL MORAVIA | 289 000 | TOTAL MORAVIA | 155 100 |
| Silesia | | Silesia | |
| Erzherzog Friedrich | 64 000 | Johann II. Fürst Liechtenstein | 9 500 |
| Bistum Breslau | 33 800 | Hans Graf Wilczek | 6 200 |
| Heinrich Graf Larisch-Mönnnich | 18 200 | | |
| Deutscher Ritterorden | 13 900 | | |
| TOTAL SILESIA | 129 900 | TOTAL SILESIA | 15 700 |

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