Wealth Inequality in Interwar Poland

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Abstract: In 1923 Poland introduced an extraordinary wealth tax. We use the internal statistics of the Ministry of the Treasury to estimate wealth inequality in interwar Poland. This data source has not been previously used by researchers. There are no estimates of wealth inequality in interwar Poland available in the literature.

According to our estimates, the top 0.01% of the wealth distribution controlled 16.4% of total private wealth. The wealth share of the top 1% stood at 41.6%. The top decile owned 67.3% of total private wealth. Wealth inequality varied strongly across regions.

A comparison of wealth inequality in Poland with wealth inequality in other European countries in the interwar period yields a diverse picture. The wealth share of the top 0.01% was the highest in Europe, the wealth share of the top 1% was in the middle of the European ranking, the wealth share of the top 10% was almost the lowest in Europe. The small elite of super-rich (0.01%) was very wealthy in comparison to the European peers, but the wealth share of the rest of the top decile was relatively low. The unequal development of former partitions may partially explain high very top wealth shares.

1. Introduction

After the publication of the "*Capital in the Twenty-First Century*" (Piketty, 2014) economic inequality has gone mainstream in social sciences. As household wellbeing is a multidimensional phenomenon (Stiglitz, Sen, and Fitoussi, 2009; OECD, 2020) it is worth studying inequality along many dimensions (Sen, 1997, Wroński, 2021a). Our aim in this paper is to estimate wealth inequality in interwar Poland. This topic has not been addressed in the literature before.

Poland regained its independence after the First World War. The country was built from three Polish partitions, which before WW I were parts of Austria-Hungary, Germany, and

Russia. The level of economic development of the former partitions was very unequal. The former German partition was the most developed, while the two remaining partitions lagged. Polish territories experienced vast destruction during WW I. Immediately after regaining independence Poland fought a war against the Soviet Union (1919-20). Figure 1 presents the borders of Poland (the Second Polish Republic) and the former partitions.

Please place Figure 1 near here

The Polish economy was relatively undeveloped. In 1926 the urbanization rate stood at only 25.6%. According to the outcomes of the 1921 Census, nearly one-third of people over 10 years of age were illiterate. 66% of the population worked in agriculture or belonged to families for which agriculture was a key income source (GUS, 1927). According to estimates of the Maddison Project, GDP per capita in Poland in 1929 stood at USD 3,374 (2011 prices) and equaled only 70% of the Czechoslovakian GDP per capita, 52% of the German GDP per capita, and 38% of GDP per capita in the UK (Bolt and van Zanden, 2020). The best source on the modern economic history of Poland available for English-speaking readers is a book on the economic history of Poland since 1774 written by Koryś (2018). Landau & Tomaszewski (1967) discuss the economic situation in Poland in the first years of the independence in detail.

The situation of the public finance of Poland in the first years of independence was terrible. Inflation was high and rising. From 1923-1924 the minister for treasury and future prime minister, Władysław Grabski implemented the so-called "stabilization policy" to combat inflation and rebalance public finances. The extraordinary wealth tax adopted in 1923 was an important part of Grabski's stabilization policy (Landau and Tomaszewski, 1999).

In this paper, we use administrative data from the extraordinary wealth tax to estimate the wealth inequality in Poland in 1923. This data source has not been previously used by researchers. No estimates of wealth inequality in interwar Poland are available in the literature. In Poland, wealth inequality on a national level was estimated only for years 2014 and 2016 (NBP, 2015, 2017).

According to our estimates, in 1923 the top 0.01% owned 16.4% of the private wealth. The wealth share of the top percentile stood at 41.6%. The top decile controlled 67.3% of the private wealth. At the very top of the wealth distribution, the wealth was mostly industrial, but in the lower quantiles of the top decile most of the wealth was held in agriculture. The distribution of agricultural wealth was more equal than the distribution of industrial wealth. We investigate wealth inequality on the national as well as on the regional level (former partitions,

provinces of tax administration). We show that wealth inequality was higher in richer, more urbanized, and industrialized regions. This may confirm Kuznet's (1955) hypothesis that economic growth and industrialization are connected with higher inequality. On the other hand, however, in a recent review Alfani (2021) shows that income inequality grew almost monotonically almost everywhere in preindustrial Europe. Van Zanden (1995) also shows evidence on the growth of inequality in the preindustrial period.

In comparison with other European countries top wealth shares (0.01% and 0.1%) were very high. However, in the lower parts of the top decile (0.1-10%), wealth was less concentrated. The wealth share of the top percentile in Poland was in the middle of the European ranking. It was higher than in Finland and Czechoslovakia, but much lower than in Sweden and the United Kingdom. The share of the top decile in Poland in the early 1920s was lowest among all European countries, except for Germany, which is a clear outlier (Dell, 2008). In interwar Poland the small elite of the extra-rich controlled a very high share of total wealth, but the wealth share of the rest of wealthy households (top $0.1 - 10^{th}$ percentile) was low in comparison with their European peers.

We firstly review the literature on wealth inequality in interwar Europe as well as the literature on economic inequality in Poland. Then we describe the political context of the extraordinary wealth tax and its design. In the next section, we present our data source and empirical methods (Pareto interpolation). Thereafter we present estimates of wealth inequality. We firstly investigate inequality on a national level, then present regional level estimates. We also discuss factors, which may be responsible for the regional variation in the wealth inequality level. Finally, we check the robustness of our estimates using the capitalization method. The last section concludes and identifies policy implications for the current debates on wealth taxation and presents directions for future research.

2. Literature review

Estimates of wealth inequality in the interwar period are available for ten European countries. Roine and Waldenström (2015) provide an excellent review of the literature on long-run income and wealth inequality. Wilterdink (1984) assesses wealth inequality in the Netherlands. Dell, Pikettty, and Saez (2007) estimate wealth inequality in Switzerland. Roine and Waldenström (2009) calculate wealth shares in Sweden. Alvaredo, Atkinson, and Morelli (2018) provide measures of wealth inequality in the UK. Garbinti, Goupille-Lebret, and Piketty (2020) estimate wealth inequality in France. Roine and Waldenström (2015) calculate wealth

inequality in Denmark, Norway, and Finland. In all cases research is based on data from wealth taxation (e.g. annual wealth tax or estate tax), sometimes merged with household surveys and capitalization methods. All the authors mentioned above study the long-run evolution of wealth inequality in the given country. In our case, it is unfortunately not possible, because wealth tax was an extraordinary, temporary measure. The research conducted by Novokmet (2018) is the closest to ours. He uses data from an extraordinary wealth tax implemented in Czechoslovakia after the First World War. Similarly to the Polish case, the wealth tax was only a temporary measure. Czechoslovakia, like Poland, did not exist before the First World War.

Dell (2008) investigates long-run wealth inequality in Germany. His research shows that wealth inequality in Germany experienced a rapid decrease after World War I and postwar hyperinflation. While in 1913 the wealth share of the top decile stood at 77.3%, in 1924 it equaled only 42.3%. The wealth share of the top 1% decreased from 44.1% in 1913 to 23.5% in 1924. In comparison with other countries, for which we have data on wealth inequality, in Germany in the early 1920s it was very low. The research conducted by Dell (2008) is of particular interest to us because Poland also suffered the high costs of war and experienced high inflation, which might lower the inequality. The results of Novokmet, as well as the results of the authors mentioned above, are presented in Table 1. To make an international comparison of our results easier we also report wealth shares estimated in this paper in Table 1.

Please place Table 1 near here

Although the methods applied and the data sources used by the authors differ, their results are still comparable. In interwar Europe, wealth inequality was highest in Sweden and the United Kingdom. It was high in France and the Netherlands. Switzerland and Denmark occupied middle positions in the ranking. In Norway and Czechoslovakia wealth shares of the rich were relatively small in comparison with European peers. In Finland, wealth inequality was lowest among all countries except for Germany, which, as mentioned above, is a clear outlier.

There are no estimates of wealth inequality in Poland in the interwar period. The 1921 Census supported by land tax statistics allowed for a detailed description of the distribution of landholdings, but only in terms of their area. According to the outcomes of the 1921 Census, 0.6% biggest farms (18,918 farms with an area larger than 100 hectares) occupied over 27% of arable land and 44.8% of total land area (including forests. grasslands, orchards, etc.) (GUS, 1926). 0.1% the biggest farms (1,964 farms with an area larger than 1000 hectares) occupied

10.5% of arable land and 21% of the total land area. In 1921 the Central Statistics Office (GUS) organized a separate Census of Large Landholdings, which provided detailed information on farms bigger than 50 hectares (GUS, 1925). Mieszczanowski (1960) and Inglot (1980) describe the agrarian structure of interwar Poland and the situation of peasants in great detail. Roszkowski (1983, 1986, 1987a) investigates large landholdings and provides a list of the 500 biggest landowners. His list was criticized by Rychlikowa (1987) and later republished in a corrected and shortened form of the 200 biggest landowners (Roszkowski, 1987b, 1991).

Unfortunately, we don't really know anything about the distribution of other forms of assets. Landau (1971) uses the data of joint-stock companies to identify the financial oligarchy of interwar Poland. However, he identifies members of boards, not owners of capital. Żarnowski (1973) assesses the social structure of the society and estimates the number of the bourgeoise. Poznańska (1991) discusses social inequalities. Kopczyński (2018, 2019), and Kopczyński and Rodak (2021) study the biological standard of living and its inequality. Wroński (2021b) estimates educational mobility. Although the studies mentioned above significantly increase our knowledge of the social structure of the Polish society in the interwar period, they do not provide estimates or at least an indicative assessment of wealth inequality. Some authors in the interwar period attempted to estimate the total value of wealth in Poland (e.g. Janicki, not indicated; Dederko, 1930), but they overestimated it. Trzciński (1935) reviews estimates of the total value of wealth made in the 1920s and early 1930s.

Estimates of income inequality in interwar Poland are available in the literature. Bukowski and Novokmet (2021) estimate long-run income inequality using income tax data combined with survey data. According to their results in 1925, the top one percentile had 10.5% of total income, while the income share of the top 0.01% equaled 0.9%. In 1925 the income share of the top percentile in France stood at 21.0%, while in Germany it equaled 10.3%. In the Netherlands, the top 1% had 17.1% of the total income. In Denmark the income share of the top percentile equaled 17.4% and in Finland, it stood at 23.3% (WIL, 2020). Therefore, income inequality in Poland may be assessed as relatively low. In his pioneering study Wiśniewski (1934) assesses income inequality in Poland in 1929. He merges tax data with wage statistics, household surveys, and his own estimate of non-market production in agriculture. According to Wiśniewski, the bottom half of the population received only 20% of the total income. The top 18% of the population controlled half of the total income. The Gini index stood at 0.48. The distribution of income from agriculture was most equal, while the distribution of capital income

was most unequal. Leczyńska and Lisiecka (2007) discuss income shares of different occupational and social groups.

We have some estimates of economic inequality in Poland in the pre-industrial period. Wagner (2016, 2020a, 2020b) study the wealth inequality in six large cities (Kraków, Warszawa, Lwów, Poznań, and Lublin) in the 17th century. Poniat (2015) estimates the wealth inequality in Grodno in 1794. Wagner and Poniat use city tax registers as the data source. Their research is similar to ours. The first difference is the time considered, the second is the level of research. While their research is limited to one or five cities, we study wealth inequality at a national level. Malinowski and Van Zanden (2017) investigate the income inequality in 16th century Poland. According to the authors, income inequality in Poland was lower than in contemporary Holland. Wroński (2021c) estimate income inequality in the Duchy of Warsaw (also known as Napoleonic Poland). He finds that income inequality in the Duchy was on a moderate level, but income inequality in the biggest cities was relatively high. Wroński (2021d) investigate the long-term evolution of income inequality in Warsaw. According to his outcomes income, inequality in the city at the beginning of the industrialization process was very high and declined between 1833 and 1925. In the interwar period, gross income inequality in Warsaw was similar to today, but net income inequality was significantly higher.

In 1891 the newspaper "*Przegląd Tygodniowy*" published a list of millionaires living in Warsaw. This list includes also owners of big fortunes situated outside Warsaw, among them members of the landed aristocracy. Although the list does not include the value of their wealth, it is still a worthwhile reference for us. The list contains 66 last names, while the editorial informs us that the number of millionaires is probably higher and about 100 of them live in Warsaw. Among 66 last names, only 12 last names are Polish. Among 12 Polish last names, 10 people are landed aristocrats. This data shows that 30 years before the introduction of the extraordinary wealth tax, the very top of the wealth distribution in the Russian partition (the largest of all partitions, inhabited by 57% of the population of interwar Poland) was predominantly non-Polish, and the role of old Polish aristocratic families was smaller than it might have been suspected (Prus, 1891). Jewish and German entrepreneurs were highly overrepresented in industry and trade.

Pytlas (1994) studies the position of the bourgeoisie in Łódź (largest industrial city of Congress Kingdom) in the years 1864-1918. Hensel (1979) investigates the social standing of the same social group in Warsaw in the second half of the nineteenth century. Both authors use notarial archives (covering inheritance and other transfers of wealth) in a systematic manner.

Although they do not estimate wealth inequality, their research provides us with a lot of data on the very top of industrial wealth in the capital of Congress Kingdom (Warsaw) and its biggest industrial city (Łódź). Both authors confirm the overrepresentation of Jews and Germans and the underrepresentation of Poles at the very top of industrial wealth. The research quoted above cast doubts on a common imagination that the top of wealth distribution in interwar Poland was dominated by old, landowning Polish aristocratic families (Piątkowski, 2018).

3. The political context of the extraordinary wealth tax and its design

World War I raised the public debts of the participating states. In many countries which fought the war, there was a widespread debate on the implementation of extraordinary wealth taxes (also known as capital levies). After the war, extraordinary wealth taxes were implemented in Germany, Austria, Hungary, Czechoslovakia, and Poland. The introduction of extraordinary wealth taxes was also a subject of public debate in the United Kingdom and France.

The proponents of extraordinary wealth taxes argued that their implementation is a just way to repay war debts, and probably the only way to do it in a short time, without paying the decades of interest. According to their arguments, national wealth was a good tax base to generate significant tax revenues in extraordinary circumstances. Moreover, in many cases, the very rich profited from the war, while the poor were dying in trenches. Older men exempt from universal conscription were significantly richer than younger men, who fought in the war. Therefore, wealth tax was seen as a tool to justly share the burden of mass mobilization and war sacrifice (Pigou, 1918). Opponents of extraordinary wealth taxes had doubts about the feasibility of the introduction of extraordinary wealth taxes (mostly due to limited liquidity of taxpayers) and feared capital flights and credit crashes. Special wealth taxes were also implemented to support rearmament, for example in Germany in 1913 (*Wehrbeitrag*), as well as in Italy and Hungary in the late 1930s. Diehl (1918), and Somary (1918) made very interesting contributions in the debate of post-war taxation in Germany. Hicks et al. (1942) discuss the experience with extraordinary wealth taxes during World War II and the interwar period. Eichengreen (1990) provides a modern review of historical debates of extraordinary wealth taxes (capital levies) and discusses the efficiency of capital levies implemented after WW I and WW II. Hughes (1988, 1999) investigates the reconstruction of social justice in Germany after WW I and WW II and sees extraordinary wealth taxes as an important tool of equalizing the burdens of war defeats.

Scheve and Stasavage (2012) provide causal evidence that mass mobilization for war led to progressive inheritance taxation. In their view, the progressive taxation of fortunes might be seen as the equal sharing of war-related sacrifice and supports the societal consensus, which is needed to mobilize large segments of the population to participate in the war effort. The authors identify the causal impact of mass mobilization on the marginal inheritance tax rate over five-year and ten-year intervals, which perfectly fits our context.

Poland experienced vast destruction during the war. The devastations of the First World War affected 90% of the country's area. Much damage was done by German and Russian occupants during the war and sabotage during their retreat (Wolf, 2003). Later large areas of the country were destroyed during the war with the Soviet Union. War spending caused the accumulation of large public debt. Even in the peaceful post-war years, the tax revenues were too small to fund public spending. Figure 2 presents data on the budget deficit and inflation in the years 1918-1923. In 1922 – the last year before the introduction of the extraordinary wealth tax – the budget deficit amounted to 48% of government revenues, while inflation stood at nearly 6,000%. In 1923 inflation decreased to 3,000%, while the budget deficit changed only marginally.

Please place Figure 2 near here

In this situation, taxation of wealth was seen as the last and only tool to significantly raise state revenues. Moreover, there was a hope that a wealth tax would be a deflationary tool, and additional revenues might be used for the funding of the central bank and the introduction of new currency.

The extraordinary wealth tax was proposed by Władysław Grabski - a Polish economist, landowner, and politician. He was the Minister for Treasury in 1923. Before (1920) and after (late 1923-25) he served as the Prime Minister. Władysław Grabski's political views situate him on the political right. Skodlarski (2015) reviews Grabski's economic and political views and his involvement in country politics. The extraordinary wealth tax was an important part of Grabski's stabilization policy, a policy package to rebalance public finance and lower inflation (see Grata, 2008; Koryś, 2018).

Although Grabski proposed the special wealth tax, the legislation was approved after his resignation[1], when Huber Linde (also a landowner and right-wing politician) served as the

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[1] In mid-1923 ruling majority in Polish parliament changed. The new prime minister – Wincenty Witos was appointed. Although he offered Grabski to remain the Minister of the Treasury and Grabski initially accepted the

Minister of the Treasury. The government was supported by parties of the center and right. In August 1923 the wealth tax bill was approved in Parliament. The parliamentary debate proved that the idea of taxation of wealth had a broad political support. However, representatives of the left criticized too low taxation of the wealthiest. Members of parliament from Ukrainian parties voted against wealth taxation claiming that Ukrainians will not fund a state that discriminates against them. Many members of parliaments across the political spectrum argued that the proposed exemption threshold is too low. As a consequence, during the legislative work, the exemption threshold was raised from CHF 2000 to CHF 3000. Although the raise was substantial, the threshold was still 5 times lower than in the case of a similar special wealth tax implemented in Italy after WW I. Farmers who owned less than 10 hectares of land in developed regions (with relatively high land prices) were rich enough to pay the wealth tax. (Sejm, 1923a, 1923b, 1923c, 1923d).

Poland implemented many progressive policy solutions immediately after regaining its independence. The income tax was highly progressive. The top tax rate equaled 35%, while in pre-war Austria it stood at 5%, in pre-war Prussia it equaled 4%, and in pre-war Russia no income tax was implemented. An extraordinary income tax of war profits was implemented. Universal health insurance and unemployment insurance were introduced (Grata, 2013). Polish left had a particularly strong political position in the first years of the independence. Before the war, it supported Polish independence, while many segments of the political right were focused mostly on improving the position of Polish lands within the existing country borders. Two first prime ministers (Ignacy Daszyński and Jędrzej Moraczewski) were socialist politicians. Józef Piłsudski, who was widely seen as the father of Polish independence was politically connected with the Polish Socialist Party. The political right was ready to accept progressive political solutions and redistributive taxation to weaken the popular support for the radical left and communist party, which was linked with the hostile Soviet Union. Moreover, after the war, pre-war value chains were broken, war destruction badly affected the economy and society, production dropped and unemployment experienced a rapid rise, which increased the support for economic interventionism. Although some liberal economists and free-market supporters held chairs at various universities, classical liberals were on the margins of political debate during the whole interwar period (Zagóra-Jonszta, 2012). Wealthy opponents of wealth taxation

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offer, Grabski resigned in July 1923. In December 1923 he was again nominated the Minister of the Treasury and remained in the office until November 1924. As we may see Polish politics in the early 1920s was quite complex and unstable.

were focused on extending the period tax payment, and increasing the number of tax exemptions, but did not try to prevent the introduction of the extraordinary wealth tax.

The extraordinary wealth tax introduced in 1923 was not Poland's first experience with wealth taxation. In the former Prussian partition, wealth tax existed before WW I. German occupants tried to implement wealth taxation during WW I, but their attempts did not always succeed. For example, the Council of Łódź refused to cooperate, arguing that the introduction of new taxes by occupants is contrary to the Hague Convention. The comparison of the German approach to wealth taxation with the Wealth Tax Law shows that German solutions served as a useful inspiration in the legislation on wealth taxation. In 1919 an extraordinary wealth tax on real estate (only in cities) and financial assets was implemented in the former Russian partition. In 1920 a small annual wealth tax with a top tax rate equaling 0.5% was implemented. The wealth taxes mentioned above failed. They were implemented in the period of high inflation and taxpayers paid late using depreciated currency. The administration of the reborn state was too weak to effectively collect complicated taxes. (Senat, 1923). However, wealth taxes implemented in 1919 and 1920 and quasi-wealth tax implemented in 1921 (in practice dependent on other taxes paid by the taxpayer) led to the production of new aggregate statistics on national wealth (Sejm, 1923; Senat, 1923).

The extraordinary wealth tax was implemented in the period of high inflation. Therefore, the extraordinary wealth tax was denominated in Swiss francs. Taxpayers declared their assets and debts in national currency (*marka polska*). Then using official currency exchange tables adopted by the Ministry of Treasury the wealth value and wealth tax to be paid were nominated in Swiss francs. Taxpayers might pay the tax in foreign currencies (Swiss francs, U.S. dollar, and other) or the national currency (firstly *marka polska*, then *złoty*). Currency conversion was based on currency tables regularly published by the Ministry of Treasury every two weeks.

The wealth tax was heavily progressive. The tax table was composed of 33 tax brackets. In the first bracket the tax rate equaled 1.2% in the last it equaled 13%[2]. The tax rates were not marginal ones, they should be applied to the total wealth of the taxpayer, not only the wealth in

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[2] In Czechoslovakia top rate of extraordinary wealth tax implemented post WW I equaled 30%. In Italy it stood at 53.3% in case of fortunes, which increased during war. In Hungary assets were taxed at different rates, ranging from 5% to 20%. The international comparison of tax rates is not easy, because in Poland the tax rate applied to the whole wealth (not only wealth in bracket). Moreover Polish tax did not aim at the partial confiscation of the top wealth, which was the case in Czechoslovakia (where top brackets were mostly populated by Germans) or Italy (in case of fortunes accumulated during war). Poland also introduced a separate tax on war profits.

the tax bracket. Wealth tax was to be paid in 6 installments in 1924-1926. We present the tax brackets, number of taxpayers, and the total wealth in each bracket in Table 2.

Please place Table 2 near here

Wealth was classified into three categories: 1) agriculture 2) industry and trade (large and middle) 3) other. The last category included small industry and trade, real estate, and other forms of wealth. During the debate on wealth taxation, the unfair distribution of wealth tax between economic sectors was the greatest fear. This importance of this topics might be partially driven by ethnic divisions between economic sectors. While landowners where predominantly Polish, Jews and German were overrepresented among the owners of industrial wealth. Therefore, the Wealth Tax Law envisioned the mechanism of fair allocation of the wealth tax to each category.

According to Grabski's idea the extraordinary wealth tax was to contribute CHF 1 billion to the state budget. Legislation predicted an automatic rise in tax rates should revenues be lower than CHF 1 billion. Each category of wealth should provide a given level of revenues (so-called "contingent"). Agriculture – CHF 500 million, large industry and trade – CHF 375 million, other – CHF 125 million (Sejm, 1923e, 1923f). Should the revenues generated by the given category be lower than the forecasted quota, the tax rates would automatically rise. In practice, the mechanism of the fair allocation of tax between sectors of the economy worked only partially. Small agricultural wealth has been exempted from the wealth tax rise. Therefore, wealth tax rates for large agricultural wealth rose to 67%, which was simply impossible to pay.

The value of wealth was defined as the value of assets minus the value of debts. Wealth tax was paid by natural persons as well as by legal persons. Although the taxation of wealth held by legal persons may be surprising from a modern point of view, it was a standard solution at that time. In the neighboring Czechoslovakia, which also implemented an extraordinary wealth tax post WW I, legal persons also paid wealth tax (Hicks, 1942). In several cases, undivided inheritance was considered a separate entity, which should pay tax. Legal persons (and undivided inheritances) also paid income tax on their own at that time (for discussion of income taxation in early 1920 see Strasburger, 1922 and Górski, 2018). Families living together (in modern nomenclature known as households) paid wealth tax together. The value of the wealth of a spouse and minor children was added to the wealth of the household head.

Wealth was to be evaluated on July 1, 1923. The valuation of assets was based on valuation tables published by the Ministry of Treasury. Both real and financial assets were taken

into account. However, as usual in the case of wealth taxation, some exemptions existed. We discuss them below. Various authors published tutorials on wealth valuation containing tables published by the Ministry (e.g. Dziembowski, 1923; Iglicki, 1923). Extraordinary wealth tax was even a theme of drama played in various theaters (Grzymała-Siedlicki, 1931). Valuation commissions controlling valuations made by taxpayers were established in each commune (lowest unit of the administrative division of the country). Commissions were composed of state administrative officials as well as representatives of social organizations (e.g. chambers of industry and trade, agricultural chambers). A list of taxpayers was published in each commune. In our opinion, it increased tax transparency and tax compliance. Due to the usage of valuation tables and social control of valuations the possibility of underreporting wealth was highly limited. Today such solutions are not implemented in the taxation of wealth (with exception of Norway), because the privacy of taxpayers is much more important than in the past.

Some forms of wealth had been exempted from taxation. Assets of state and local governments, trade unions, religious organizations, housing cooperatives were exempt from taxation. Furnishing and other household appliance less than CHF 5,000 (in total) were exempt from taxation. Since joint-stock companies were taxed as separate entities the shares of joint-stock companies were exempt from taxation. State bonds were also exempted. Special exemptions were also granted to soldiers, who received farms and owners of farms destroyed during the war situated in Eastern provinces. The assets owned by the state and local government were also not subject to taxation. Foreign entities (both households and legal persons), who did not live in Poland were obliged to pay wealth tax on their Polish wealth. Polish citizens who lived in Poland paid wealth tax also based on their foreign wealth. Polish citizens, who lived abroad might pay wealth tax only on their wealth held in Poland.

The wealth tax failed to achieve its fiscal aim. The total wealth of taxpayers was lower than expected. Wealth tax rates were simply too high and many taxpayers could not pay the wealth tax because their income was too low. The high value of wealth does not always correspond to high income, therefore taxpayers' liquidity is often a problem in the case of wealth taxation (OECD, 2018). The mechanism of an automatic increase in tax rates raised tax rates on agricultural assets to 67% (Sejm, 1925). Taxpayers were punished for the overestimated forecast of revenues made by the Ministry of Treasury before the implementation of the tax. Those who complied and paid the tax were penalized for the behavior of those who did not. High wealth tax rates were very critically assessed by the commission of American

financial experts invited to Poland in the mid-1920s to provide advice on public finance (Kemmer, 1926). In 1925 the total quota of revenues predicted by the wealth tax law (so-called "contingent") was lowered to CHF 400 million, only 40% of the previously predicted revenues. The payment period was extended. (Sejm, 1925; Morawski, 1990). The final revenues amounted to slightly over CHF 300 million. The extraordinary wealth tax was an important support for state budget in 1924 (ca 15% of total revenues) and to lesser extent in 1925, but did not realized it's long-term aims. In 1926 the project of the bill introducing yearly wealth tax was sent to parliament by the government (Sejm, 1926). However, the government collapsed a few days later (Morawski, 1990). The initiative to establish a yearly wealth tax shows that the introduction of extraordinary, temporary wealth tax gives strong incentives to introduce "normal" annual wealth taxes. After the collection of the extraordinary (temporary) wealth tax, the tax administration is well prepared to collect wealth taxes on a yearly basis, which lowers the administrative cost of wealth taxation. Usually, high administrative costs are an important argument against the taxation of wealth (OECD, 2018; Wroński, 2021e). In the late 1930s, special laws were implemented to end remaining tax arrears (Ministerstwo Skarbu, 1927; Solarski, 1935; Żurawski, 1939).

4. Data and empirical strategy

Our main source of data is the publication *Statistics of Direct Taxation 1925* (*Statystyka akcji wymiarowej i poborowej podatków bezpośrednich oraz opłat stemplowych za rok 1925*). It is an internal publication of the Ministry of Treasury (Ministerstwo Skarbu, 1926) stored in the Ministry's archives in Central Archives of Modern Records (*Archiwum Akt Nowych*). The publication presents information on the number of taxpayers, the total wealth of taxpayers, and wealth tax, which shall be paid. The information on total wealth and tax due is also given in division into three categories of wealth (agriculture, large industry, and trade, other) created by the legislators. Data is presented in each tax bracket separately. The information is available at national and regional levels. Regional units are defined by 13 regions of tax administration. 11 regions directly correspond to administrative provinces (*województwa*), Two regions in Eastern Poland consist of more than one province[3]. Figure 3 presents the regional division of the country (regions of tax administration), which will be used later in the paper to investigate regional variation in wealth inequality. Table 3 presents information on the administrative division of

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[3] Markowski (1931) discusses the organization of tax administration in interwar Poland in great detail.

tax administration as well as the number of taxpayers and total wealth of taxpayers in each region.

Please place Figure 3 near here

Please place Table 3 near here

As written above the wealth tax has been paid not only by households but also by legal persons. Income tax similarly did not differentiate between natural and legal persons. In the case of income tax the share of legal persons in the total amount of taxpayers was less than 1%. Unfortunately, our data source does not differentiate between wealth held by natural persons and legal persons. The impact of the inclusion of legal persons (such as e.g. joint-stock companies) on the estimates of wealth inequality is not clear. On the one hand, it may inflate wealth inequality measures, because companies, which are owned by many persons are taxed as one entity. On the other hand, however, the large industrial and financial fortunes might pay a wealth tax through many legal persons. We have also to keep in mind that large state-owned enterprises were exempt from taxation. As the number of legal persons is small, similarly to Bukowski and Novokmet (2021) we think that their inclusion in has limited impact on our estimates. To assess the impact of the inclusion of legal persons in wealth tax statistics we perform a robustness exercise, in which we estimate the value of wealth held by legal persons based on the capitalization of income tax paid by legal persons. To keep the structure of the paper clear we discuss this robustness check after the presentation of the main results of the paper.

We use wealth shares as a measure of wealth inequality. We firstly provide measures of wealth inequality on the national level, then we estimate wealth inequality in each of the three former partitions. Finally, we report measures of inequality on the regional level using shares-within-shares (e.g. share of top 0.1% wealth in top 1% wealth). Then, we discuss the structure of wealth along the wealth distribution.

We estimate wealth inequality using Pareto interpolation techniques. This is a common approach in the case in which tax data is expressed in brackets (Kuzents, 1955; Piketty, 2001; Atkinson, 2007; Atkinson and Piketty, 2007, Cowell, 2011; Wroński, 2019; Bukowski and Novokmet, 2021). In our case, we have information on the number of taxpayers and total wealth in each tax bracket $(s_i; s_{i+1})$. Therefore the application of Pareto interpolation is rather simple.

In order to estimate the value of chosen percentile (let's say P99) we pick (s_i;p_i) and (s_{i+1};p_{i+1}) such that $p_{i+1} < 1\% < p_i$ (s stands for the limits of tax bracket, p stands for the proportion of the population above s_i). Pareto cumulative distribution function F (y) for wealth is:

$$1 - F(Y) = \left(\frac{k}{y}\right)^a$$

Then we compute the parameters of the Pareto distribution (a, k) using the following formulas:

$$b = \frac{y_i}{s_i}$$

$$a = \frac{b}{(b-1)}$$

$$k = s_i p_i^{1/a}$$

Y_i stands for average wealth of the population above s_i. We use estimated parameters to compute the value of the chosen percentile, let's say P99.

$$P99 = \frac{k}{0.01^{1/a}}$$

Then we compute the average value of wealth over the chosen percentile (Cowell and Van Kerm, 2015).

$$P99 - 100 = \left(\frac{a}{a-1}\right)P99$$

As our data is expressed in many dense tax brackets our estimates are not dependent on particular distributional assumptions. If we estimated wealth inequality without using any distributional assumptions (assuming that each taxpayer in the bracket has the same wealth equal to the mean wealth in the bracket) our results would change only slightly[4].

Our estimates assume are based on tax data and therefore may be prone to tax evasion. Although the social control of tax decelerations and availability of lists of taxpayers probably

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[4] For example, the wealth share of top 1% would equal 37.52% instead of 37.50%. The wealth share of the top 5% would equal 51.70% instead of 51.79%.

reduced the evasion, it surely did not eliminate it. Moreover as explained above some types of assets (e.g. state bonds, household furnishings, libraries) were exempt from taxation.

To assess the potential impact of tax evasion and exemptions we divide estimated top wealth by 0.9, which is a standard practice in the estimation of inequality when the tax-based numerator is combined with a denominator based on national accounts.

Statistical sources do not contain direct information on the number of households in interwar Poland. To estimate the size of our control population we follow Bukowski and Novokmet (2021). We use outcomes of the 1921 Census presented in the Statistical Yearbook 1926 (GUS, 1927). We sum the number of married females[5], widows, and widowers, people living in separation and people, whose civil status is not known. Then we add the number of single males and females minus the number of males and females younger than 20 years old. As the Statistical Yearbook presents only the information on the intersection between civil status and gender and does not present the information on the intersection between civil status and age, we have to use this simplifying assumption. According to our estimation the number of households equaled 9.67 million. To analyze the share of taxpayers in the household population across regions of tax administrations we assume that the household population is distributed in the same way as the total population. The assumption of the common household structure is, of course, a simplification, but the information on civil status and gender is given only at the national level.

According to administrative estimates, the total value of wealth in Poland equaled 25 billion zł (Sejm, 1923a). This estimate was made in two steps. First, total value of land was calculated based on detailed land holding statistics. Then the information on the composition of wealth was used to calculate the total value of wealth. The information on the composition of wealth was based on data from the previous 1920 wealth tax and other statistical sources, especially administrative data and insurance statistics (Sejm, 1921).

The estimate given above includes assets owned by the state and other public entities. Because wealth inequality is usually measured in the relation to private wealth, we should subtract public ownership from national wealth.. The share of state ownership in national wealth was assessed at 15-25% (Heydel, 1932; Secomski, 1947; Gołębiwski 1985; Zagóra-Jonszta,

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[5] According to the outcomes of 1921 Census the number of married females was 3% higher than the number of married males. We prefer to use the higher number, but this choice does not have a significant impact on our results. The difference is simply too small.

2017). 20% is the most often used estimate (see Luszniewicz, 2018a, 2018b for a broader discussion of the role of state ownership in Poland in the early 1920s). Therefore, we also apply this estimate and calculate the total value of private wealth as 80% of the total value of national wealth. We estimate the value of total private wealth at 20.0 billion zł. The information on the wealth structure is presented in Table 4. In the Appendix, we further discuss the estimate of national wealth and present alternative estimates of wealth inequality in the case of change in the value of total wealth.

Please place Table 4 near here

The value of taxable wealth stood at 59.9 % of the value of total private wealth. After the correcton for tax evasion, this share rises to 66.7%. Due to the definition of categories in 1923 the extraordinary wealth tax is different than in the statistics quoted above, we compared the value of the second and the third category of taxable assets (large industry and trade + other) with the total value of assets in industry and real estate. The value of taxable agricultural land equaled 42.2% of the total value of private land. In the case of industry and trade and real estate, the share of taxable wealth (calculated together for two categories) in private wealth (industry and trade + real estate) stood at 96.4%. The share of taxable wealth in industry and trade is higher than in agriculture because industrial wealth was more concentrated. Moreover, the value of industrial wealth was usually big enough to cross the tax threshold. Agricultural wealth is much less concentrated and many farms were too small to cross the tax threshold. According to official statistics among 29 million hectares of agricultural land in Poland, nearly 12 million hectares were owned by people whose wealth was under the tax threshold (Sejm, 1926).

5. Results

5.1 National level

We follow the existing literature and use wealth shares as the measure of wealth inequality. Wealth shares are easy to interpret and may be calculated without individual data on the wealth of taxpayers. Later we present estimates of wealth inequality covering the whole distribution based on Generalized Pareto interpolation (Blanchet et al., 2021) As discussed in the review of the literature wealth shares are commonly used in the research on wealth inequality based on tax data. Estimated wealth shares on a national level are presented in Figure 4.

Please place Figure 4 near here

The top 0.01% held 16.4% of the private wealth. The wealth share of the top 0.1% equaled 27.0%. The top percentile owned 41.6% of the private wealth. The richest 5 % of the population held 57.4% of the private wealth. The wealth share of the top decile equaled 67.3%.

The comparison of wealth inequality in Poland to the situation in other European countries (presented in Table 1) yields interesting results. In Poland, the wealth share of the top 0.01% was the highest among all countries for which we have such a measure. In Sweden, it was 5 percentage points lower (9.6%), while in Switzerland (5.1%) it was nearly three times lower. The wealth share of 0.1% in Poland was significantly higher than in Switzerland (16.5%), similar as in Sweden (25.4%) but lower than in the United Kingdom (33.1%). The wealth share of the top 1% in Poland was in the middle of the European ranking. It was higher than in Germany (23.5%), Finland (25.4%), and Czechoslovakia (33.0%), and similar as in Norway (37.6%), and Denmark (39%). The wealth share of the top percentile in Poland significantly lower than in the Netherlands (47.5%) and France (47.7%). The wealth shares of the top percentile in Sweden (51.5%) and the United Kingdom (60.2%) were much higher than in Poland. Wealth shares of the top 5% and top decile in Poland were among the lowest in Europe. Only in Germany, which is a clear outlier, wealth shares of the top 5% and the top 10% were significantly lower than in Poland.

Why the very top wealth shares in interwar Poland were so high? The unequal level of the economic development of former partitions may serve as an explanation. According to estimates made by Bukowski et al. (2019) in 1910 GDP per capita in Prussian Partition (4449 GK$) was 20% higher than the GDP per capita in the Russian partition (3770) and 75% higher than the GDP per capita in Austrian partition. The mean wealth of taxpayers in the Prussian partition equaled 25,172 CHF and was much higher than in the former Russian partition (CHF 11,752), and the former Austrian partition (CHF 10,856). The value of wealth at top percentiles (P99, P99.9, P99.9) in the former Prussian partition was significantly higher than in the rest of the country (see the next subsection and Appendix Table A3). Śląsk (Silesia) was responsible for nearly 80% of all wealth reported in the top, open tax bracket. When we remove Śląsk from our estimation the wealth share of the top 0.01% drops to 13.1% and the wealth share of the top 0.1% decreases to 22.5%. These estimates are significantly lower but still relatively high in comparison with European peers. Ethnic inequality in land ownership in Eastern provinces is another important factor. In these areas, large entails owned by Poles coexisted with small farms owned by Ukrainians, Belarusian and those, who did not have developed national identity yet.

This comparison indicates that the extra-rich in Poland were relatively (in comparison with the rest of the country population) wealthier than in other European countries. The share of the top 0.01% was highest among the countries for which we have data, the share of the top 0.1% was also relatively high. However, the wealth of the remaining 99% of the top decile (0.1-10th percentile) was lower than in other European countries. Therefore, the share of the bottom 90% of the distribution was especially high. Piketty (2014) states that researchers use multiple measures of wealth inequality, not only a single, abstract index (like Gini or Theil Index). Our results confirm that usage of wealth shares generates a more diverse picture of wealth inequality than a comparison of wealth inequality indices.

Today in Poland the top percentile holds 20.3% of the total wealth, while the top decile wealth share equals 49.6% (Brzezinski, Sałach and Wroński, 2020). These shares have been calculated based on survey data merged with rich list data. The level of wealth inequality in interwar Poland was much higher than today. A comparison of our estimates of wealth inequality with estimates of income inequality in the late 1920s calculated by Bukowski and Novokmet (2021) shows that wealth inequality was higher than income inequality. This is a common situation. The bottom 50% of the population can live without wealth, but cannot live without income. Wealth inequality may also be seen as income inequality accumulated over time.

When comparing wealth inequality in Poland in the 1920s with other European countries in that era and contemporary Poland we have to keep in mind differences in the structure of the society. In the interwar period in Germany, less than 30% of the labor force worked in agriculture. In Czechoslovakia, this share stood at 35%, while in France it equaled 36%. In Italy, 43% of the labor force worked in agriculture. In Poland, this share was higher than 60% (Żarnowski, 1973). As mentioned above, among 29 million hectares of agricultural land in Poland, nearly 12 million hectares were owned by people whose wealth was under the tax threshold (Sejm, 1926). If peasants own farms (as it was in Poland), the existence of many small farms lowers wealth inequality (at least measured using wealth shares) because it increases the share of people who own some form of wealth. In our view, the high share of employment in agriculture lowered the wealth share of the top decile.

Comparing wealth inequality in Poland and other European countries we also have to keep in mind that Poland experienced vast war destruction during WW I, and later during the war with the Soviet Union. Piketty (2014, 2019) and Scheidel (2017) show that wars may work as wealth equalizers because the rich have more to lose than the poor. After the war, Poland

experienced two episodes of hyperinflation, which also must have an impact on the wealth distribution. Therefore, similarly as in Germany (Dell, 2008), in the early 1920s wealth inequality might be at a low point. Bukowski and Novokment (2021) find that income inequality in Poland in the 1920s was relatively low and increased thereafter, until World War Two. Unfortunately, we do not have data to analyze the evolution of wealth inequality in Poland over a longer period.

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Our data source covers only the top decile of wealth distribution. To provide estimates on the distribution of wealth among the bottom 90% of households we rely on generalized Pareto interpolation. Blanchet et al. (2021) prove that generalized Pareto curves may be effectively used to estimate the distribution of wealth even if data on the distribution of wealth is very limited.

The results of Pareto interpolation are presented in Table 5. According to our outcomes the wealth share of the bottom, 50% stood at 6%, while the wealth share of the middle 40% equaled 34%. The Gini index was equal to 0.73. Results based on generalized Pareto interpolation are similar to estimates of wealth inequality presented above.

5.2 Regional level

In 1918 Poland regained its independence after over a hundred years of partition. We have quite detailed estimates of total wealth at the former partition level. According to official estimates of the Treasury Committee of the Polish parliament (Sejm, 1921), the total value of wealth in the former Russian partition (the Congress Kingdom and Kresy) equaled 54% of the value of national wealth. The share of the former Prussian partition in the national wealth stood at 25%. The share of the former Austrian partition in the national wealth stood at 20%.

In Appendix Table A3 we report our estimates of percentiles of the wealth distribution for each Partition[6] and each province of tax administration. Although some regional variation exists, values of wealth at the 90th and 95th percentile are relatively similar. On the very top of the wealth distribution value of wealth varies significantly between regions. For example, while CHF 7,177 is enough to be in the top 1% of wealth holders in Polesie, CHF 25,294 is needed

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[6] Here, we must note one important caveat. The Śląsk (Silesia) province of tax administration is composed of areas which before the war were parts of Germany and Austria-Hungary. As most of the province was part of Germany, we assign Śląsk to the former Prussian partition. Nevertheless, technically speaking Silesia was not a part of partitions, because Poland lost this area long before partitions.

to cross this threshold in Warsaw. The value of 99.99th percentile in Polesie equals only CHF 189,450. In Silesia, however, CHF 2,109,724 is needed to be at the extreme top of the wealth distribution. It is also interesting that in some provinces with relatively low values of 90th and 95th percentile, the value of wealth at the very top of the distribution is very high. Śląsk (Silesia) is good example here.

We use our data to estimate wealth shares in former partitions. The regional variation in wealth inequality is worth investigating because it increases our knowledge of wealth inequality. Moreover, as the level of economic development of partitions was unequal it might generate new insights on the link between economic development and wealth inequality. Figure 5 presents wealth shares of the top 0.01%, 0.1%, 1%, and 5% in each of the three former partitions. We do not report the wealth share of the top 10%, because in some partitions the number of taxpayers is too small for that.

Please place Figure 5 near here

Our estimates show that wealth inequality was highest in the former Prussian partition, where the wealth share of the top 0.1% stood at 36.0%. In the former Russian partition, it equaled 24.9%, while in the former Austrian partition it was equal to 20.2%. Similar differences may be observed in the case of wealth shares of the top 0.01% and top 1%. The former Prussian partition was the most developed. The share of employment in the industry was higher than in the rest of the country. Agriculture to a larger extent produced for the market and was dominated by middle and large farms[7]. Moreover, several German aristocrats still owned large estates there. These factors probably increased the wealth inequality in comparison with the rest of the country. The mean wealth of taxpayers in the former Prussian partition stood at CHF 25,172 and was much higher than in the former Russian partition (CHF 11,752), and the former Austrian partition (CHF 10,856). However, research conducted by Dell (2008) shows that the former Prussian partition was relatively poor in comparison with the rest of the German Empire. The wealth inequality in the Russian partition was higher than the wealth inequality in the former Austrian Partition. The distribution of wealth in the former Austrian partition was most equal, but still, considerable inequality existed there.

To further investigate the regional variation in wealth inequality we estimate wealth inequality at the level of tax administration regions (mostly corresponding to voivodeships, see

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[7] Bukowski et al. (2019) and Koryś and Tymiński (2021) provides estimates of GDP per capita in each partitions before WW I and discuss their economic development.

Figure 3). Since data on total wealth on this level is not available, we only observe the concentration of wealth among taxpayers. To measure wealth inequality, we estimate shares-within-shares. Figure 6 reports the share of the top 0.1% wealth in the wealth of the top 1% and the share of the top 1% of taxpayers in the top 5% of wealth.

Please place Figure 6 near here

The concentration of wealth at the top was highest in Śląsk (Silesia), where the top 0.1% of taxpayers controlled 90% of the wealth of the top 1% of taxpayers. The share of the top 1% in the top 5% of wealth was nearly the same. The wealth inequality was lowest in Eastern provinces (except Lviv), and in the case of the share of the top 0.1% in the top 1% also in Pomerania. The shares-within-shares in central provinces are relatively similar

We use various characteristics of the voivodeships to investigate possible correlates of the concentration of taxpayers' wealth. Figure 7 reports the most interesting correlations. Higher wealth inequality (measured using shares-within-shares) is positively correlated with population density, urbanization, and direct taxes revenues per capita. This result suggests that regions which are more developed are also more unequal. Our results are in line with the outcomes of Bukowski and Novokmet (2021) for income inequality. They find that income inequality in interwar Poland was higher in more developed regions. We also find that the share of the top 1% in the top 5% of wealth is positively correlated with the share of Poles in the population. The share of farms smaller than 5 hectares is also another correlate of the concentration of wealth at the top of the wealth distribution.

Figure 8 reports the regional composition of the top percentile of wealth distribution (measured on a national level). Three provinces: Warsaw (capital), Łódź, and Śląsk (industrial areas) generated 53% of the top 1% wealth, despite being inhabited only by 24% of the country population. Four eastern provinces inhabited by 38% of the country's population were responsible for only 17% of the wealth of the top 1%. Similar regional discrepancies exist in the case of the distribution of wealth of the top 0.1%/ the top 5% / the top 10%.

5.3 Assets composition

Our data source also reports the composition of assets. Three categories are reported: agriculture, large industry and trade, and other (small & middle industry and trade, real estate, other assets). As the limitation between the second and third categories (based on industry tax categorization) is not crucial for our analysis we merged these categories and investigated the

division between agricultural wealth and non-agriculture wealth. Figures 9-12 present the composition of assets along the distribution, firstly on a national level, then on the regional level (former partitions).

Please place Figures 9-12 near here

On a national level, the share of agricultural wealth in the total taxable wealth equaled 46.5%. There is a significant variation in the share of agricultural wealth across former partitions. While in the former Russian partition this share is slightly higher than 50%, and in the former Austrian partition it is slightly lower than 50%, in the former Prussian partition agriculture generated less than a third of the total taxable wealth.

The assets composition varies also along wealth distribution. At the very top of the wealth distribution (the top 0.01%), wealth was mostly held outside agriculture. The share of agricultural wealth in the total wealth of taxpayers belonging to the top 0.01% varied between 9.4% in the former Prussian partition and 21.7% in the former Austrian partition. Among the next 0.09% of taxpayers, agriculture is responsible for ca. 50% of their wealth, except for the former Prussian partition. In lower segments of the top decile, wealth is mostly agricultural, especially among those whose wealth is between the 90th and 95th percentile of the wealth distribution. The contrast of assets composition of 5-9.5th percentile between the former Prussian and the former Russian partition is striking. While in the former even in that segment of the distribution industrial wealth is responsible for half of the total wealth, in the latter agriculture generates over 90% of the wealth. Unfortunately, we cannot report the composition of the assets of this part of the wealth distribution in the former Austrian partition, because the share of taxpayers in the population was too low. As the population of the former Russian partition was significantly higher than the population of the former Prussian partition (57% vs 15% of the total country population) the strong contrast in the composition of assets of top 5 – 9.5th percentile existed also between the former Prussian partition and Poland as a whole.

The data presented above shows that already in the early 1920s the richest of the rich were mostly engaged in industrial and financial activity. It is in contrast with the popular opinion that top wealth in interwar Poland was mostly held by large landowners, mostly Polish aristocrats. As we shortly discussed in the literature review this opinion is not correct. While Poles were overrepresented among large landowners, they were underrepresented among industry owners. The common perception that the top of wealth distribution in interwar Poland was dominated by large Polish aristocratic families is at least partially driven by the fact, that

Polish aristocratic families are still present in the national imagination, while Jewish and German entrepreneurs have been forgotten. We have also to keep in mind that agriculture in Poland was heavily indebted in the interwar period. Since the XVIth century, Poland was exporting large amounts of agricultural products (mostly grains). In the XIXth century, Prussian Poland was among the most important agricultural regions in Prussia. After WW I value chains were broken (Russia transited to communism, Polish-German international relations were very bad), which limited the incomes of landowners. Even the richest among landowners had to take loans to maintain the level of consumption from pre-war times (Rychlikowa, 1971). While land owned by landowners was easy to see, their debts were hidden from the public. The fact that even the largest landowners had to sell part of their land through a land reform partition scheme to pay wealth tax (Archiwum Radziwiłłów z Niebiorowa, 1924-6) also shows that the financial position of large landowners was rather weak. While land owned by landowners was easy to see, their debts were hidden from the public. Because wealth tax was based on net wealth (the value of assets – the value of debt), the high indebtedness of agriculture reduced taxable wealth held by landowners. Our results are in line with the research of Landau & Tomaszewski (1977), who find that among top income holders, industrialists are more common than the landed aristocracy. Among 155 persons who paid income tax in the highest, open bracket 91 belonged to the so-called "financial oligarchy" (Landau, 1971) – a network of people controlling multiple enterprises.

Our results on the assets composition of the wealthy might be compared with the results of Piketty et al. (2006), and Piketty (2019) who investigated the wealth concentration in France in 1807-1994 based on estate tax data. Piketty (2019) reports the division of Parisian wealth into real estate assets and financial assets in the years 1872 and 1912. Although this classification is not the same as the classification applied in estate tax data, it is still obvious that agricultural land in Poland in 1924 was a more important component of wealth than in France in 1872. While in France in 1872 share of real estate outside Paris (including not only agricultural land, but also buildings in other cities) in wealth of the top 1-10% stood at 15% in Poland the share of agricultural wealth in the wealth of the top 1-10% equaled 74%. Even in the most industrialized region (Łódź), this share stood at 62%. The gap between Paris and Poland (as a whole, and only including its most industrialized region) in the asset composition of the top 1% is also significant. Novokmet (2018) reports the asset composition in Bohemia based on the extraordinary wealth tax introduced post WW I. The share of land in the wealth of the top 5-10 % equaled approx. 43% and was significantly lower than in Poland, where it stood

at 86%. However, in the top 1%, the share of land in the total wealth was relatively similar in Poland and Bohemia. This comparison shows that in the early 1920s land was a more important component of top decile wealth than in 1870s France (represented by Paris) and in 1919 in Bohemia.

6. Robustness checks

As mentioned above our data source does not differentiate between households and legal persons. In the case of income tax, the share of legal persons in the population of taxpayers was lower than 1%. In the case of the wealth tax investigated in this paper, we do not have data on the number of legal persons who paid wealth tax. However, we have to keep in mind that many large joint-stock companies owned by the state did not pay the tax, because state ownership was exempt from taxation.

The impact of the inclusion of legal persons in tax statistics on wealth inequality is not clear. On the one hand, it may raise estimated wealth inequality because of the existence of a few, very large taxpayers (e.g. large joint-stock companies). On the other hand, however, many companies owned by one person were taxed separately, which may bias our estimates of wealth inequality in interwar Poland downwards. Since legal persons were taxed on their own, the shares in joint-stock companies were exempt from taxation.

To assess the impact of the inclusion of legal persons on wealth inequality we estimate the value of legal persons' wealth based on capitalization exercise. In 1924[8] 3,174 legal persons (mostly joint-stock companies, and limited liability companies) paid income tax. The Yearbook of the Ministry of Treasury provides detailed tax statistics. We have information on the number of taxpayers and the total income of taxpayers in each tax bracket (Ministerstwo Skarbu, 1928). As the income tax had 49 dense tax brackets, we have good information on the income of taxpayers.

We capitalize the income of legal persons using an interest rate equal to 8%. This interest rate corresponds to the interest rate of state bonds and was assessed by Landau and Tomaszewski (1977) as adequate for interwar Poland. Then we subtract the estimated value of corporate wealth from the value of wealth reported in the given bracket of wealth tax tabulations. As in the early 1920s foreign entities owned approx. 20% of the capital in joint-stock companies (Landau, 1989), we simultaneously decreases our estimate of total private

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[8] Although the extraordinary wealth tax was based on wealth assessment made in 1923, 1924 is the first year for which we have administrative tabulations of income tax paid by legal persons.

wealth by 20% of the estimated value of legal person wealth. Foreign entities paid wealth tax on their ownership in Poland, but because they do not reside in Poland, we decide to exclude their wealth from the denominator. Finally, we allocated 80% of the estimated corporate wealth to different segments of wealth distribution.

We estimate four different scenarios of our exercise. In the first, capitalized corporate wealth is completely excluded from tax statistics. In the second, we allocate 80% of the estimated corporate wealth to all taxpayers. In the third, we allocate 80% of estimated corporate wealth to the top 2.5% of wealth distribution. In the last one, we allocate 80% of estimated corporate wealth to the top 1% of wealth distribution. The allocation is made based on the distribution of total wealth, we allocate capitalized wealth to all taxpayers/top 2.5%/ top 1% the same way as the total wealth is divided between all taxpayers/ top 1%/top 2.5%. In our view, because industrial and financial assets were highly concentrated and controlled by small, "financial oligarchy" (Landau, 1971) the last scenario (the allocation of capitalized wealth to top 1% of wealth distribution) is the best one. Even today in Poland, shares are predominantly held by the very top of the wealth distribution (NBP, 2017). In the early 1920s, when capital markets were much less developed, the share ownership was probably even more concentrated at the top. The detailed study of Pytlas (1994) on industry owners in Łódź shows that typically large plants were owned by a single person or a family. Even if the shares were publicly traded, a majority of them were held by a small group of shareowners, who controlled the enterprise. The 1920s in Poland were not a period of numerous, anonymous, and small shareholders.

The second scenario (allocation of the capitalized wealth to the top 2.5% of the wealth distribution) may serve as a benchmark, while the first scenario (allocation of the capitalized wealth to all taxpayers) almost certainly underestimates the wealth inequality. Nevertheless, all scenarios are worth investigating to analyze the sensitivity of our wealth inequality estimates. The outcomes of our robustness exercise are presented in Table 6.

Please place Table 6 near hear

Data presented in Table 6 shows that the inclusion of wealth held by legal persons to tax statistics to some extent inflates the wealth share of the extra-rich. In the baseline scenario, the wealth share of the top 0.01% equals 16.4%. In the case of exclusion of corporate wealth, it drops to 13.6%. If we allocate corporate wealth to all taxpayers (top decile of the wealth distribution) it decreases further to 13.1%. In our preferred scenarios, in which corporate wealth is allocated only to the strict top of the wealth distribution the wealth share of the top 0.01%

equals 14.5% (capitalized wealth allocated to the top 1%) or 14.0% (capitalized wealth allocated to top 2.5%).

Even if very top wealth shares are to some extent overestimated, our robustness exercise proves that it does not invalidate our finding that the concentration of the wealth at the very top in Poland was extremely high in the comparison with other European countries. Even if the second scenario, in which the wealth share of the top 0.01% is lowest (13.1%) it is still significantly higher than in Sweden (9.6%), and over two times higher than in Switzerland (5.1%). Our sensitivity analysis also does not change the fact that the wealth share of the top 1% was relatively modest and the wealth share of the top decile was small in international comparison.

Although our data source does not provide micro-level data on the wealth of taxpayers, we find some individual documents in archives. For example, we find correspondence on the wealth tax of Hans Henrich XV von Hochberg, the Prince of Pless (Pszczyna) and probably the richest person in interwar Poland. His wealth was estimated at CHF 90 million (Generalna Dyrekcja…, 1925). This corresponds to over 8% of the total wealth of in the highest, open tax bracket (value of wealth higher than CHF 16,000,000), 134 times the value of 99.99[th] percentile of the wealth distribution at the national level or 75,000 annual wages of typical industrial workers. Due to the design of extraordinary wealth tax, this number still excludes some components of Prince's wealth. We found also tax declarations of Janusz Radziwiłł, a member of one of the richest aristocratic families. His wealth was assessed at CHF 6.5 million (Archiwum Radziwiłłów…, 1924-6), which is nearly 10 times more than the value of 99th percentile of the wealth distribution at the national level. According to Pytlas (1994) 15-20 multimillionaires and 20-25 millionaires lived in Łódź in the years 1910-1914. The biggest industrialist owned wealth in the range of 10-12 million rubles. Although the war destruction decreased the value of plants, the industrialist did not disappear. In the interwar period still many millionaires lived in Łódź (Skrzydło, 1999). Inheritance statistics shows that in years 1927-1929 31 persons received inheritances with a value higher than one million Polish zlotys (PLN, the new Polish currency, at that time devaluated to CHF 1.72), including 3 persons who received an inheritance valued at more than five million PLN[9] (Ministerstwo Skarbu, 1931).

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[9] Unfortunately, we cannot use inheritance tax statistics to estimate wealth inequality. In the interwar period as well as today it was not the estate (wealth of a deceased person) itself that was taxed, but the income from inheritance. Therefore statistics report the number of people who received an inheritance of a given value, not the value of the estate. As inheritance is often divided between many recipients, there is no easy way to convert income from inheritance to the value of estates.

This example clearly shows that very top wealth in tax tabulation is not the outcome of the inclusion of legal persons in tax statistics.

7. Conclusions

In 1923 Poland introduced an extraordinary, temporary wealth tax. It was a part of the stabilization policy package aimed at reducing the budgetary deficit and inflation. Although the wealth tax missed its fiscal aim and generated less than 40% of the forecasted revenues it provides us with detailed data on the top decile of the wealth distribution. Tax data is a perfect source to assess wealth inequality. It covers the top of the wealth distribution, which is often missed by surveys. Due to the legal consequences of underreporting and social control of wealth valuation the possibilities to underreport the value of wealth are limited. We use this data and first provide estimates of wealth inequality in interwar Poland.

In 1923 the top 0.01% of the population held 16.4% of total wealth, and the top 0.1% of the population controlled 27.0% of the total wealth. The share of the top percentile stood at 42.5%, while the wealth share of the top decile equaled 67.3%. The analysis of data on the composition of the assets of taxpayers (top 10% of the wealth distributions) shows that the value of agricultural land was most equally distributed, while the distribution of the value of assets in industry and trade was most unequal.

The comparison of wealth inequality in Poland with wealth inequality in other European countries in the interwar period yields interesting results. On the one hand, top wealth shares (share of 0.01%, 0,1%) were very high. On the other hand, however, the wealth share of the top decile was relatively small. In interwar Poland, a small elite of the super-rich (top 0.1%, 9170 households) controlled a very high share of wealth but the rest of the top decile was relatively poor in comparison with European peers. Wealth inequality in Poland in the early 1920s was significantly higher than today. It was also higher than contemporary levels of income inequality (Bukowski and Novokmet, 2019). The unequal development of former partitions (especially the gap between Silesia and the rest of the country) may partially explain high very top wealth shares. Ethnic inequality in land ownership in the Eastern provinces of the country is another important factor.

After the financial crisis and the COVID pandemic, the debate on wealth taxation experienced a revival. We may learn several lessons on the example of the Polish extraordinary wealth tax adopted in 1923, which may be important in the current context. Firstly, the limited liquidity of taxpayers is an important obstacle in the taxation of wealth. Although wealth is

correlated with income, this correlation is not perfect. Many households owning significant wealth do not necessarily receive high incomes, especially in turbulent periods. Secondly, overly high tax rates may kill the wealth tax. The mechanism of an automatic increase in tax rates in the case of revenues lower than forecasted cannot work. Finally, the Polish experience with wealth taxation in the interwar period clearly shows that the introduction of extraordinary, temporary wealth tax generates strong incentives to implement annual wealth taxation.

In this paper, we provide the first estimate of wealth inequality in Poland in the interwar period. Our knowledge of historical trends in wealth inequality in Poland remains limited. Therefore, the investigation of wealth inequality and its change over time remains a promising direction for future research. It would be very interesting to study the evolution of wealth inequality in the interwar period and its change after World War Two. If individual tax declarations will be found it will allow the position of different ethnic groups in the wealth distribution to be studied. The study of wealth inequality – especially in the case of Poland – is relatively young and still offers many promising topics for future research.

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**Figure 1. Second Polish Republic and current country borders**

Location of the Second Polish Republic

— border of the Second Polish Republic
— country borders, 2021
- - borders of the partitions
○ major city

ESTONIA

RUSSIA

LATVIA

LITHUANIA

Kaunas
Vilnius

Minsk

BELARUS

Gdansk

Szczecin

Berlin

Poznan

Warsaw

GERMANY

Wroclaw

Kyiv

Katowice

UKRAINE

CZECHIA

Krakow

Lviv

SLOVAKIA

AUSTRIA

HUNGARY

ROMANIA

Source: own.

Figure 2. Inflation and deficit: 1918-1923
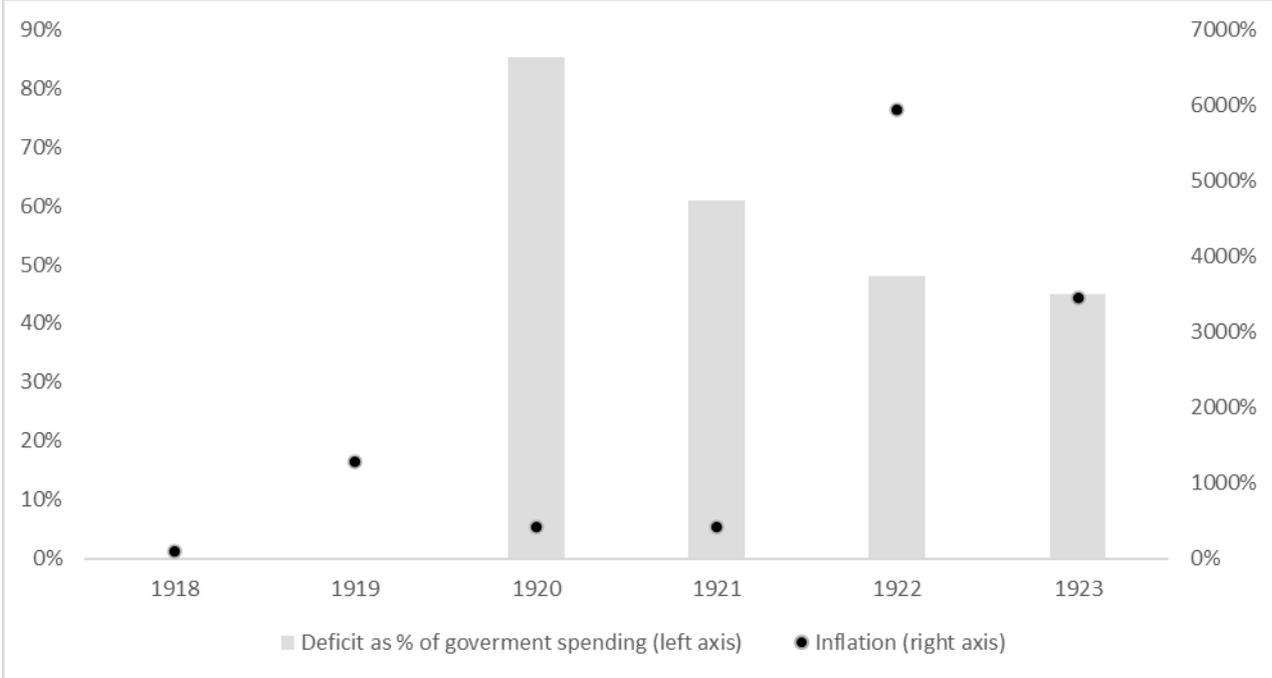
Source: own based on Landau and Tomaszewski (1967).

Figure 3 Administrative division of tax administration
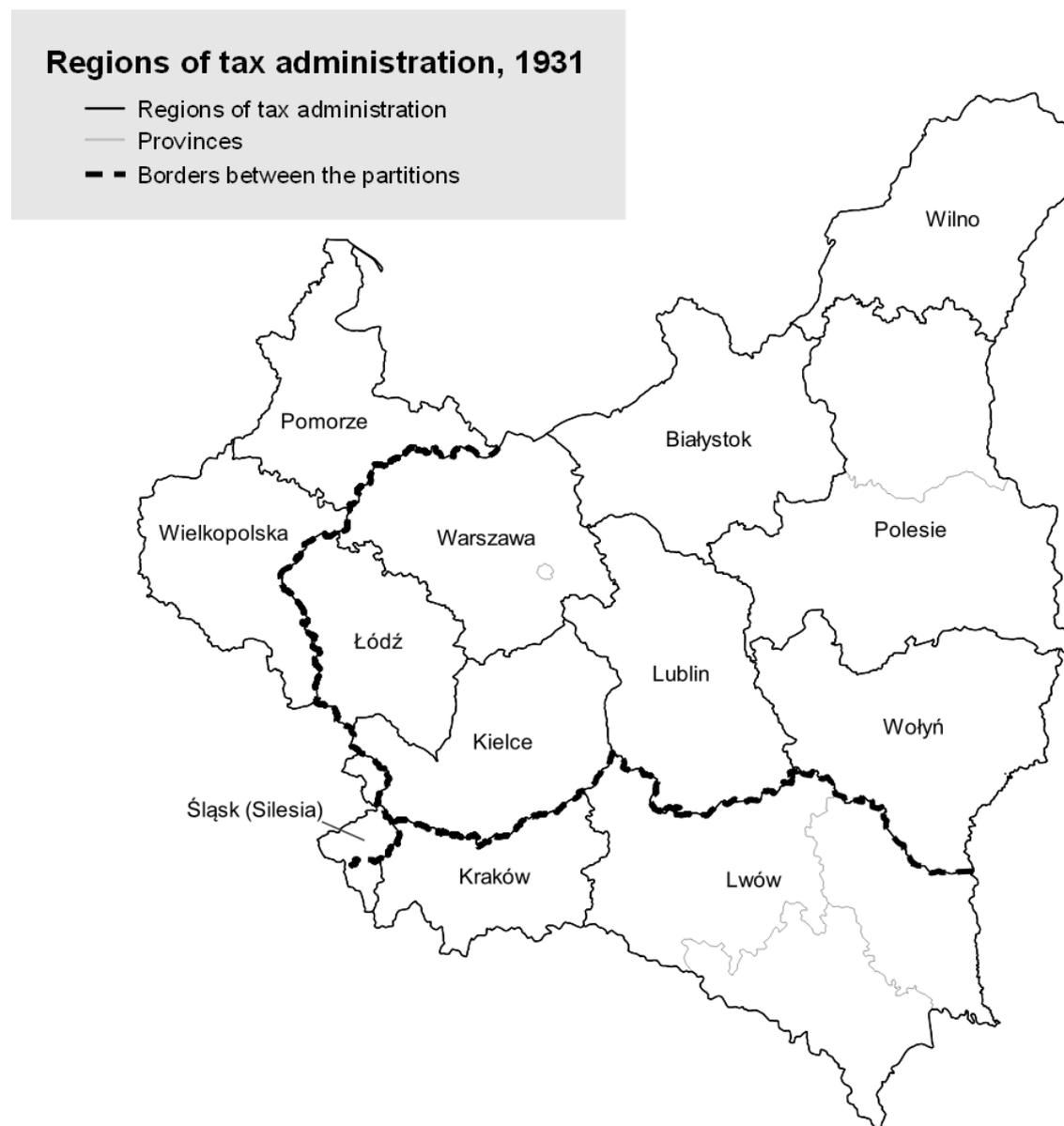
Source: own based on Ministerstwo Skarbu (1928).

Table 1. Wealth inequality in interwar Europe. Wealth shares of top wealth groups.

	0.01%	0.1%	1%	5%	10%
Czechoslovakia (1919)			33.0%		75.0%
Denmark (1923)			39.9%		83.6%
Finland (1922)			25.4%		64.4%
France (1923)			47.73%		80.48%
Germany (1924)			23.5%	37.0%	42.3%
Netherlands (1925)			47.5%		
Norway (1930)			37.6%		84.6%
Sweden (1920)	9.60%	25.37%	51.51%	79.25%	91.69%
Switzerland (1925)	5.09%	16.49%	40.68%	64.55%	75.83%
United Kingdom (1923)		33.1%	60.2%	82.2%	83.3%
Poland (1923) [our estimates]	**16.4%**	**27.0%**	**41.6%**	**57.4%**	**67.3%**

Source: for Czechoslovakia Novokmet (2018); for Denmark, Finland, Norway Roine and Waldenström (2015); for France Garbinti, Goupille-Lebret and Piketty (2020); for Netherlands Wilterdink (1984); for Switzerland Dell, Piketty and Saez (2007); for United Kingdom Alvaredo, Atkinson and Morelli (2018); for Germany Dell (2008), for Poland our estimates presented in this paper

Table 2. Wealth tax brackets.

Threshold	Wealth (Swiss francs - CHF)	Tax rate	Number of taxpayers	Wealth of taxpayers (CHF)
1	3 000 – 4 500	1.2%	406 117	1 501 176 548
2	4 500 – 6 000	1.4%	186 492	971 077 566
3	6 000 - 7 500	1.6%	97 053	650 004 833
4	7 500 – 10 000	1.8%	81 733	704 588 195
5	10 000 – 12 500	2.0%	38 493	494 562 098
6	12 500 – 15 000	2.2%	23 246	319 257 600
7	15 000 – 25 000	2.4%	38 778	765 200 330
8	25 000 – 35 000	2.6%	15 069	435 931 083
9	35 000 – 45 000	2.8%	7 354	289 869 218
10	45 000 – 60 000	3.0%	6 840	345 999 015
11	60 000 – 75 000	3.2%	3 888	245 829 655
12	75 000 – 90 000	3.4%	2 485	196 515 129
13	90 000 – 120 000	3.6%	3 089	311 022 950
14	120 000 – 150 000	3.8%	1 965	252 617 375
15	150 000 – 180 000	4.0%	1 365	211 669 705
16	180 000 – 240 000	4.25%	1 572	315 646 012
17	240 000 – 300 000	4.5%	1 026	262 730 651
18	300 000 – 360 000	4.75%	581	179 976 258
19	360 000 – 480 000	5%	686	274 305 800
20	480 000 – 600 000	5.25%	371	214 659 229
21	600 000 – 800 000	5.5%	320	219 141 606
22	800 000 – 1 000 000	5.75%	184	164 263 553
23	1 000 000 – 1 500 000	6.0%	231	272 778 023
24	1 500 000 – 2 000 000	6.5%	108	184 996 152
25	2 000 000 – 3 000 000	7.0%	108	269 780 627
26	3 000 000 – 4 000 000	7.5%	48	158 987 404
27	4 000 000 – 6 000 000	8.0%	37	170 954 496
28	6 000 000 – 8 000 000	8.5%	23	162 873 406
29	8 000 000 – 10 000 000	9.0%	15	131 270 439
30	10 000 000 – 12 000 000	10.0%	9	100 117 041
31	12 000 000 – 14 000 000	11.0%	4	50 329 557
32	14 000 000 – 16 000 000	12.0%	4	59 461 856
33	more than 16 000 000	13.0%	26	1 107 535 229
Total	.	.	919 320	11 995 128 760

Source: own based on Ministerstwo Skarbu (1926)

Table 3. Regional division of tax administration

Region	Province(s) (*województwa*)	Number of taxpayers	The total wealth of taxpayers	Mean wealth of taxpayers
Białystok	białostockie	64 023	458 539 526	7 162
Kielce	kieleckie	84 524	913 281 590	10 805
Kraków	krakowskie	57 714	682 544 062	11 826
Lublin	lubelskie	123 077	913 651 385	7 423
Lwów	lwowskie, tarnopolskie, stanisławowskie	110 471	1 142 880 162	10 346
Łódź	łódzkie	99 217	1 544 391 033	15 566
Polesie	poleskie, nowogródzkie	35 911	274 726 987	7 650
Pomorze	pomorskie	26 953	414 613 162	15 383
Warszawa	warszawskie	130 415	2 370 078 197	18 173
Wielkopolska	poznańskie	62 924	1 097 580 256	17 443
Wilno	wileńskie	26 034	281 279 275	10 804
Wołyń	wołyńskie	72 780	515 056 587	7 077
Śląsk (Silesia)	śląskie	25 277	1 386 506 538	54 852

Source: own estimation based on Ministerstwo Skarbu (1926).

Table 4. Aggregate data on wealth (billion CHF).

Assets type	Total wealth	Private wealth	Taxable wealth	Share of taxable wealth in private wealth
Total	25.0	20.0	12	59.9%
Land (agriculture)	16.6	13.3	5.6	42.2%
Industry and trade	7	5.6	3.9 +2,5	96.4%
Real estate	1.3	1.0		

Source: own estimation based on Ministerstwo Skarbu (1926)

Figure 4. Wealth inequality: national estimates
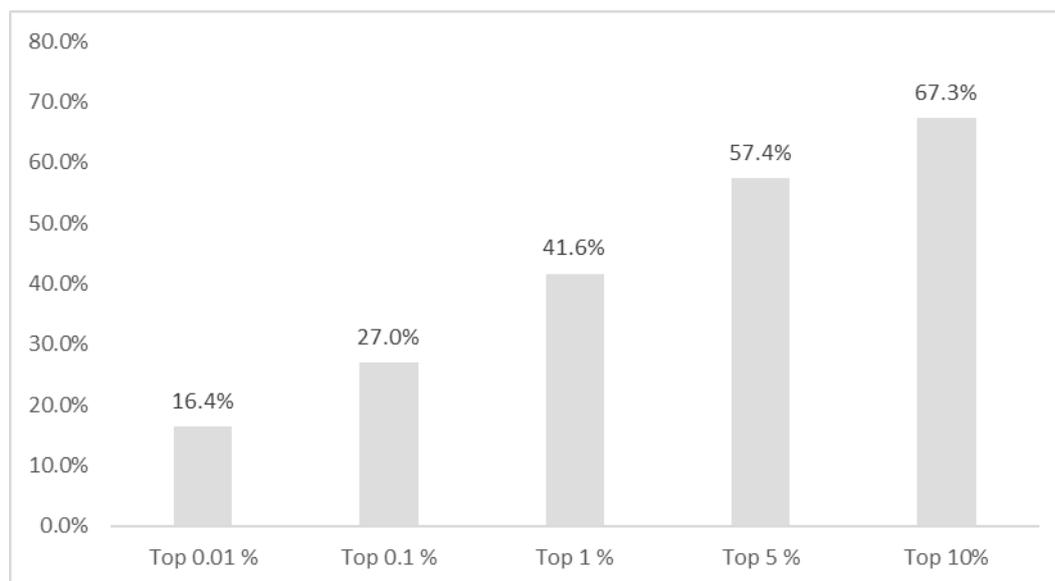
Source: own estimation based on Ministerstwo Skarbu (1926)

Figure 5. Wealth inequality: former partitions
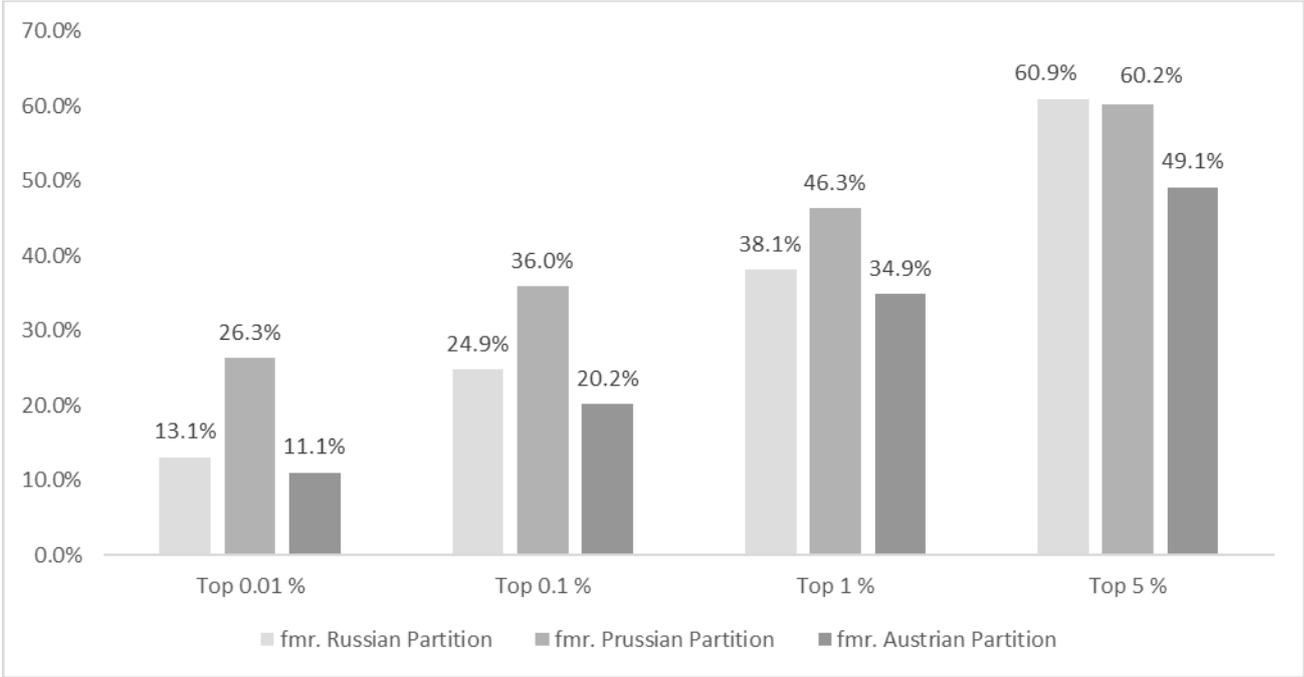

Source: own estimation based on Ministerstwo Skarbu (1926)

**Figure 6. Wealth inequality: regional level (shares-within-shares).**
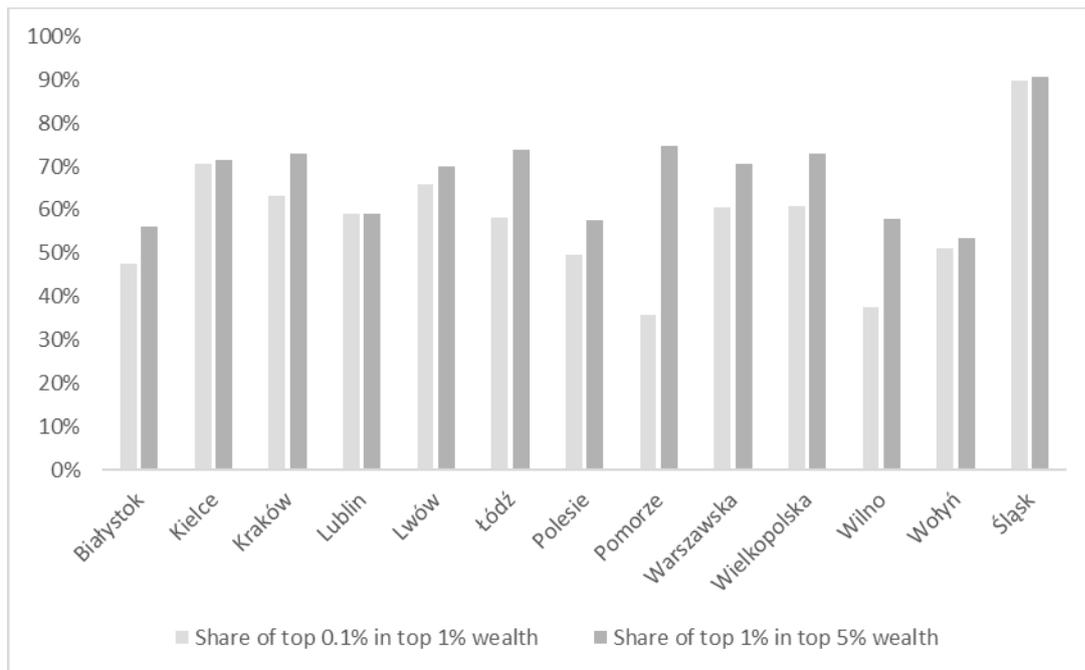
Source: own estimation based on Ministerstwo Skarbu (1926).

Figure 7. Corelates of wealth inequality (measured using shares-within-shares)

Figure 7 consists of five correlation graphs. They should be put together, for example at the bottom or the top of the page. The size of graphs may be reduced.
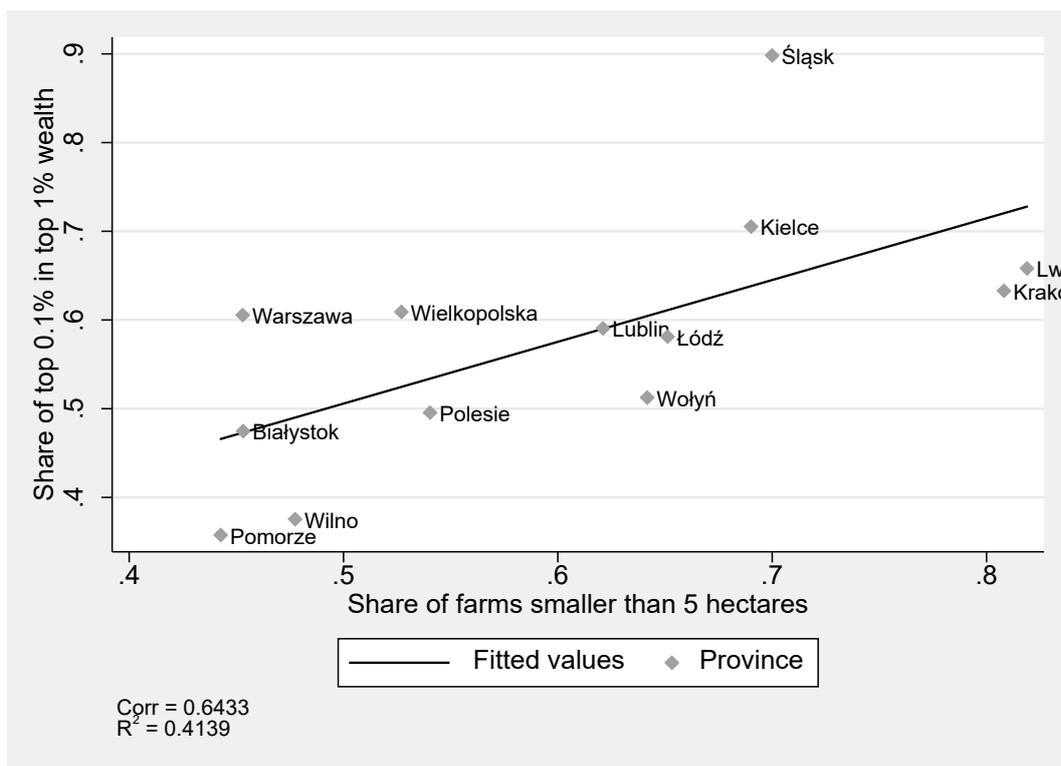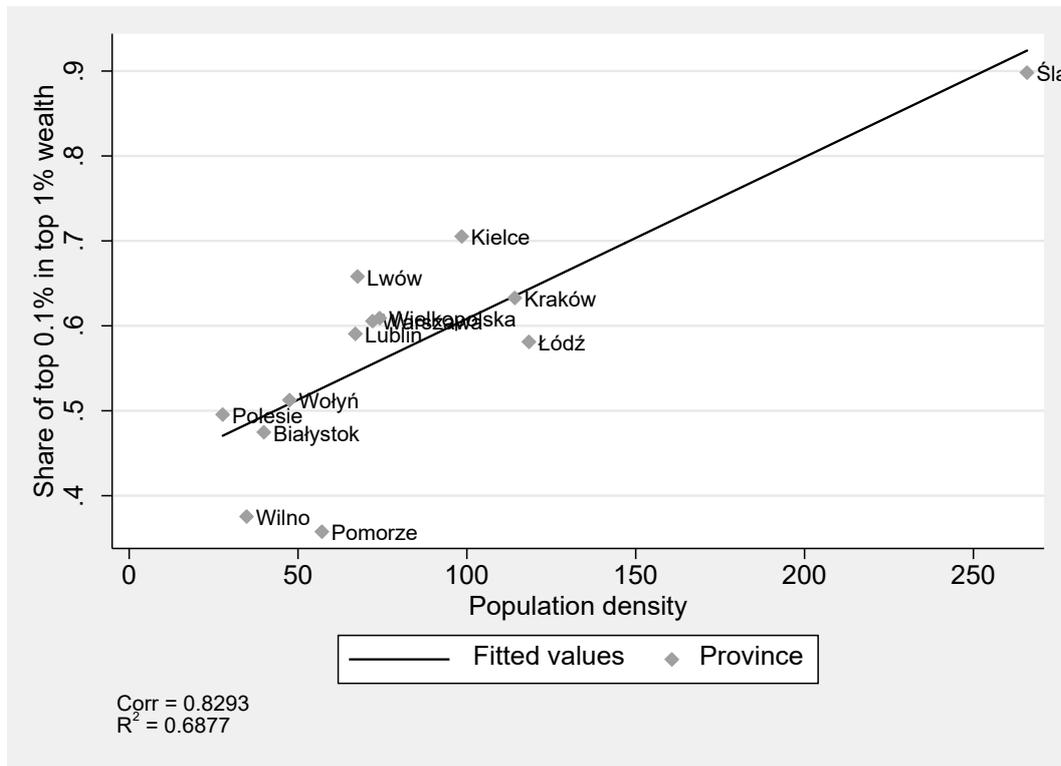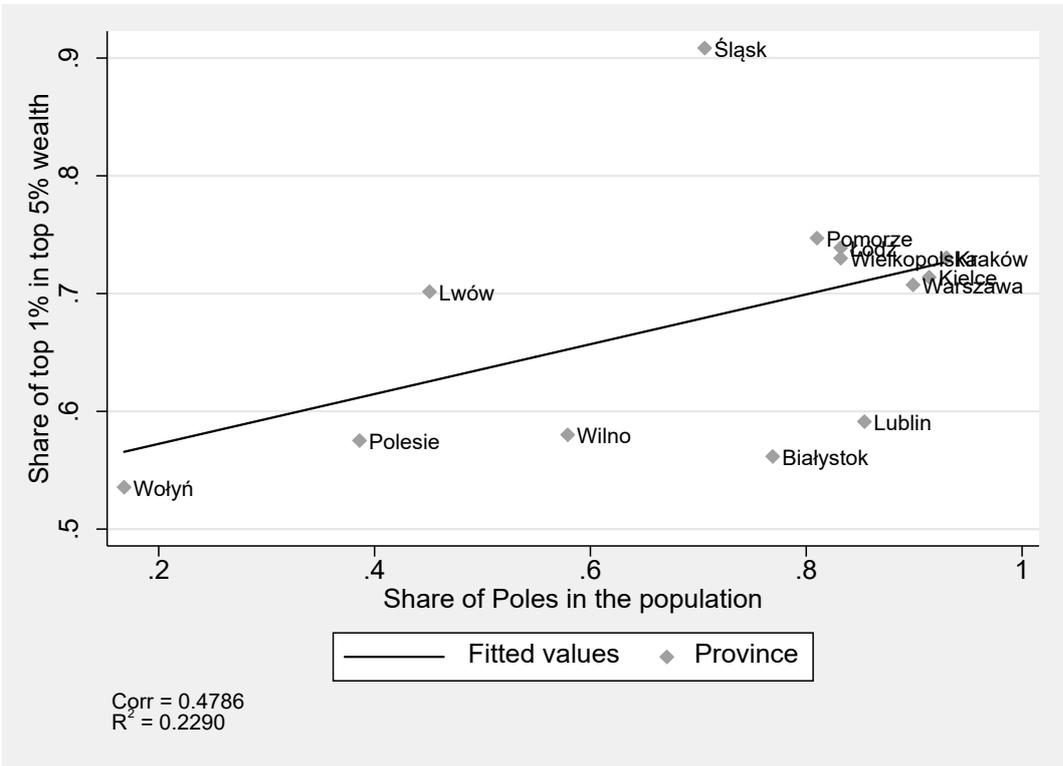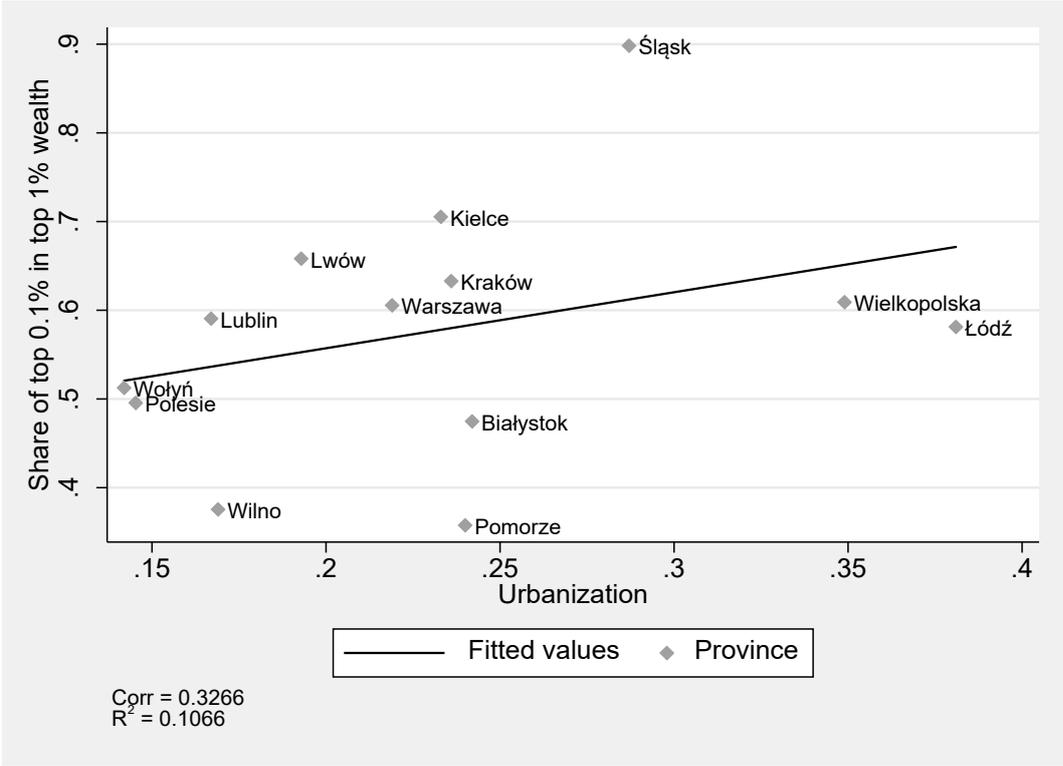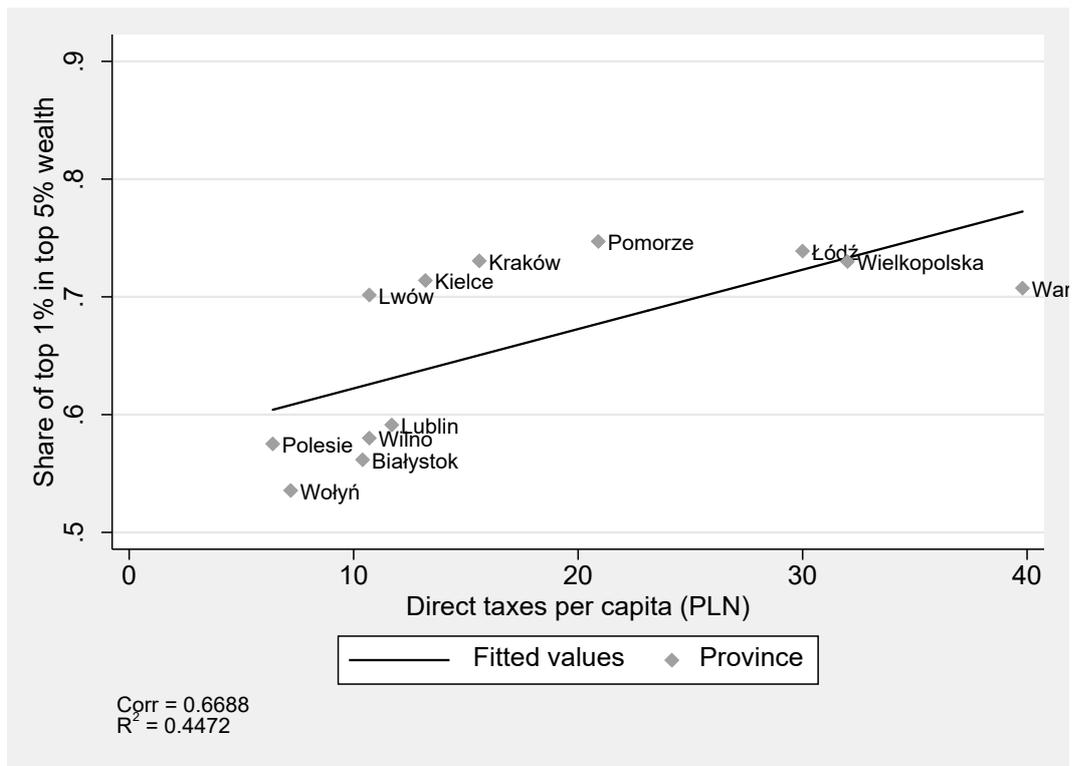
Source: own estimation based on Ministerstwo Skarbu (1926) and census data.

**Figure 8. Regional composition of the top 1% wealth**
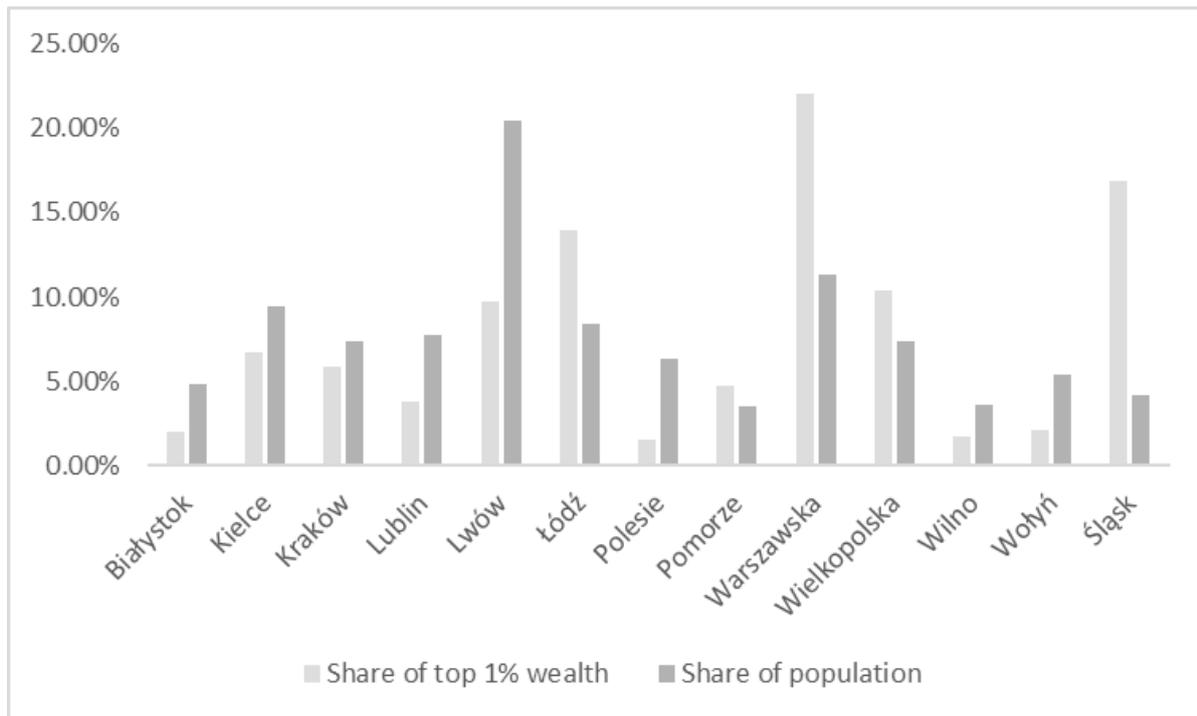
Source: own estimation based on Ministerstwo Skarbu (1926)

**Figure 9. Wealth composition: national estimates**
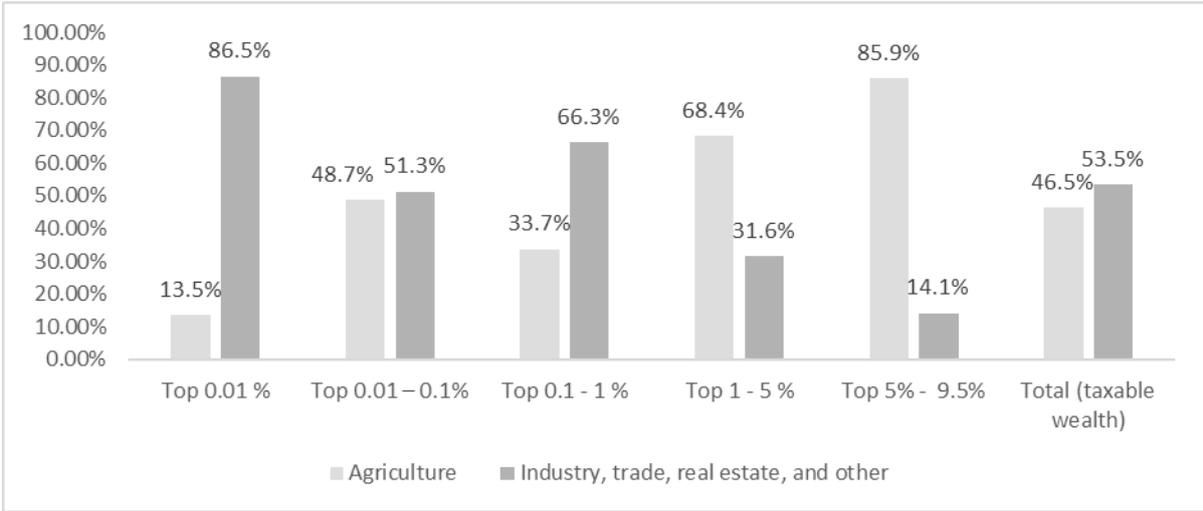
Source: own estimation based on Ministerstwo Skarbu (1926).

**Figure 10. Wealth composition: former Russian partition**
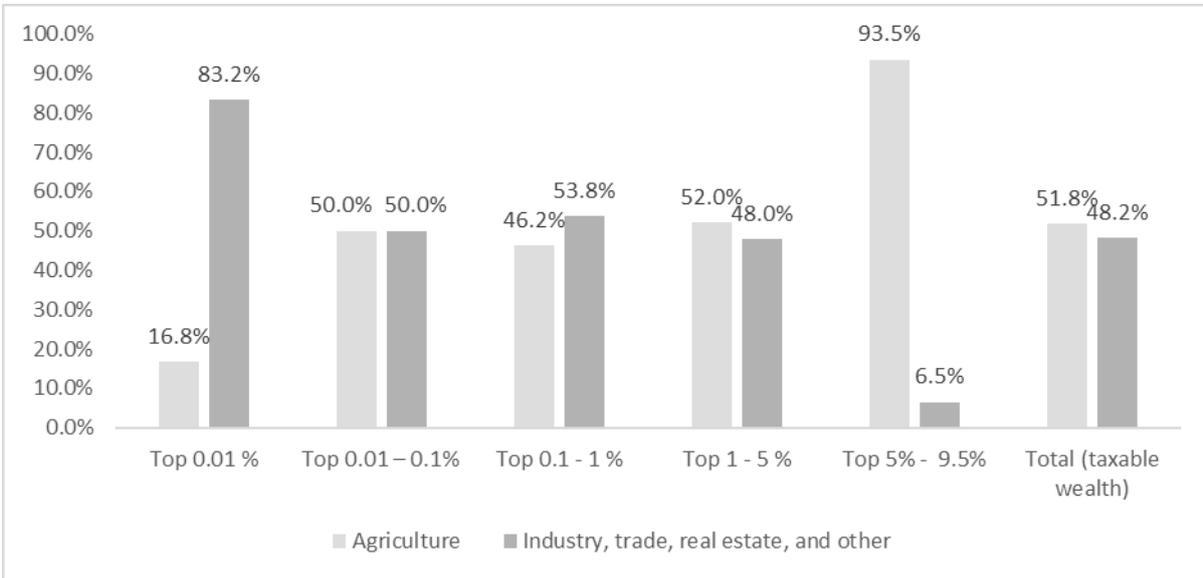
Source: own estimation based on Ministerstwo Skarbu (1926).

Figure 11. Wealth composition: : former Prussian partition
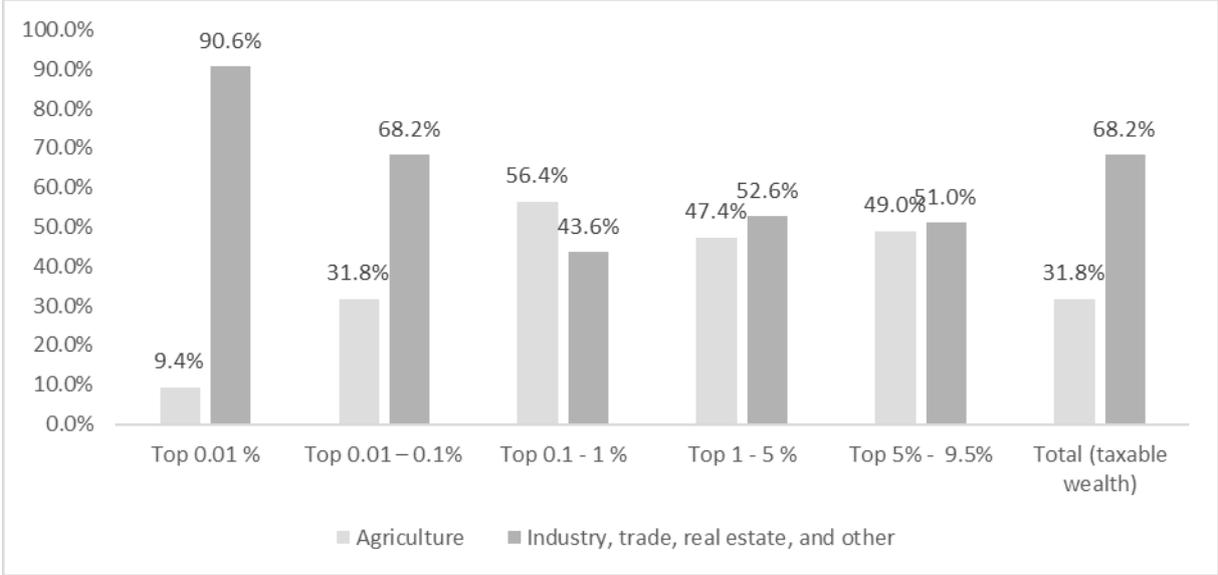
Source: own estimation based on Ministerstwo Skarbu (1926).

Figure 12. Wealth composition: former Austrian partition.
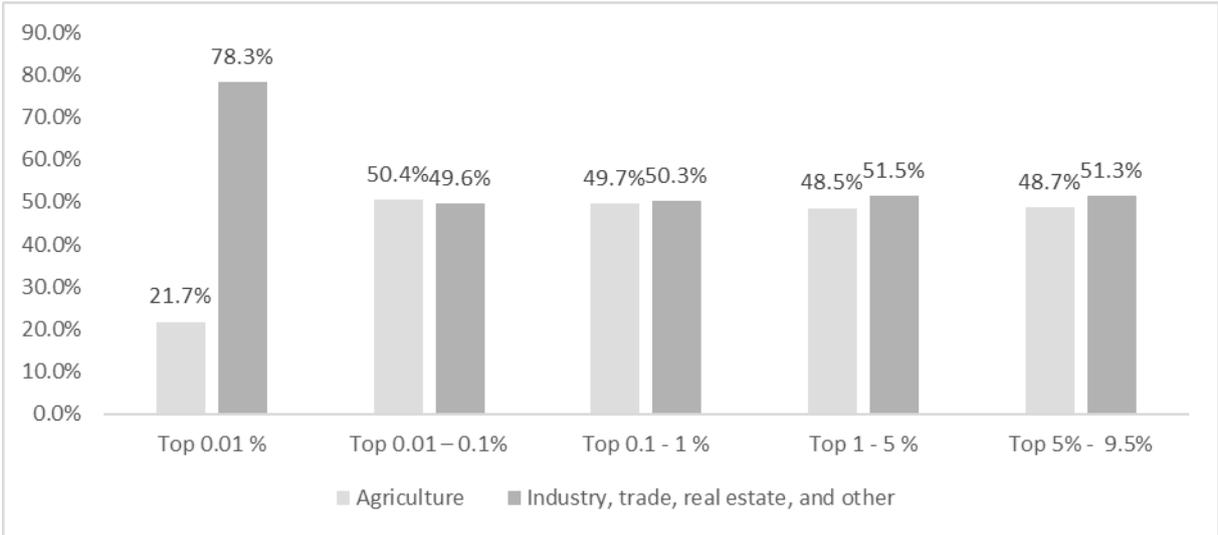
Source: own estimation based on Ministerstwo Skarbu (1926).

Table 5. The distribution of wealth estimated by generalized Pareto interpolation

	Value
Mean wealth	2 077 CHF
P90.5	3 000 CHF
P95	4 712 CHF
P99	13 830 CHF
P99.9	105 104 CHF
Bottom 50% share	5.8%
Middle 40% share	33.7%
Top 10% share	60.6%
Top 1% share	38.2%
Gini index	0.733

Source: own estimation.

Table 6. The impact of wealth held by legal persons: sensitivity analysis.

	Baseline	Corporate wealth (CW) excluded	CW allocated to all taxpayers (lower bound)	CW allocated to top 2.5% (benchmark)	CW allocated to top 1% (preferred estimate)
Top 0.01 %	16.4%	13.6%	13.1%	14.0%	14.5%
Top 0.1 %	27.0%	23.3%	22.4%	24.0%	25.0%
Top 1 %	42.5%	38.5%	36.9%	39.6%	40.9%
Top 5 %	57.4%	56.0%	53.7%	56.8%	56.8%
Top 9.5%	67.3%	65.3%	67.5%	67.5%	67.5%

Note: "CW" stands for corporate wealth.

Source: own estimation based on Ministerstwo Skarbu (1926; 1928)

Appendix I. National wealth estimate

A1.1 Estimate of national wealth in 1923

Wealth taxation provides extensive information on the top of the wealth distribution but does not provide any information on the wealth of those, who do not pay wealth tax. Top-wealth estimates based on wealth tax data must be merged with the estimate of national wealth based on other data sources. Therefore estimates of top wealth shares are to some extent dependent also on the estimate of national wealth. In this appendix, we provide more information on the estimates of national wealth used in this paper.

Before the introduction of an extraordinary wealth tax, the Polish government estimated the value of national wealth at 25.0 billion CHF (Sejm, 1923). This estimate was made in two steps. Firstly value of agricultural wealth was estimated. Because the land tax was collected at that time detailed information on the total size and the distribution of arable land was available. The total area of arable land in Poland equaled 54,000,000 morgen (morga = 0.55 hectare). The average price of land stood at 300 CHF pro morga. Thus the value of arable land was estimated at:

(1) 54,000,000 * 300 CHF = 16,200,000,000 CHF.

To obtain a measure of the value of other forms of wealth government relied on the Report of the Treasury Committee of Polish Parliament adopted in 1921 (Sejm, 1921). The Committee estimated the share of agricultural wealth in total wealth at 66,3%. Thus the total value of national wealth was estimated at:

(2) $\frac{16,200,000,000 \, CHF * 100}{66.3} = 24,400,000,000 \, CHF$

This estimate did not include the value of wealth in areas, which were obtained by Poland after 1918 (Vilnius, Upper Silesia). Therefore an estimate of national wealth has been increased to 25,000,000,000 CHF.

As explained in the paper various forms of wealth owned by the state (enterprises, land, public utilities) were exempt from taxation. Thus, we need to obtain an estimate of private wealth. Here, we rely on the assessment of historians and economists, who studied the state-owned industry and public finance in the interwar period. The state was a significant landholder. According to the official statistics of the Ministry of Treasury 11.0% of agricultural land (including forests) was owned by the state. Churches and other non-profit quasi-public

entities owned 1.2% of agricultural land. Therefore only 87.8% of agricultural land was controlled by private entities (mostly households). The state also controlled many large industrial enterprises, but here we do not have the exact estimates of their value (Ministerstwo Skarbu, 1928). State also owned railways, infrastructure, public utilities. The share of state ownership in national wealth was assessed at 15-25% (Heydel, 1932; Secomski, 1947; Gołębiowski 1985; Zagóra-Jonszta, 2017). 20% is the most often used estimate (see Luszniewicz, 2018a, 2018b for a broader discussion of the role of state ownership in Poland in the early 1920s). Therefore we use it to estimate the total value of private wealth at 20,000,000,000 CHF.

Although we see the estimate of national wealth as relatively robust, it is surely less complex than we would prefer and thus not perfect. Therefore we provide sensitivity analysis and estimate the value of wealth shares and Gini index in the case to of +/- 10% change in the estimate of private wealth. Alternative estimates of wealth inequality based on generalized Pareto-interpolation (Blanchet et al., 2021) are presented in Table A1. The increase/decrease in total private wealth (which serves as the denominator) without a corresponding change in top wealth (nominator, provided by tax data) results in approx. 10% decrease/increase of top wealth shares and Gini index. If private wealth is assumed to equal 18,000,000,000 CHF the top 10% equals 67%, while the top 1% share is equal to 42.5%. Even in this scenario, the wealth share of the top 10% is lower than the mean top 10% in Europe (75.7%, see Table 1). Poland catches up with Finland, but the gap between Poland and the rest of the countries is still significant. Therefore comparisons between Poland and reaming European countries for which we have data on top shares in the interwar period made in this paper remain valid.

Table A.1 Alternative estimates of wealth inequality (generalized Pareto interpolation)

	Baseline (raw data)	National wealth − 10%	National wealth + 10%
Private wealth (CHF)	20 B	18 B CHF	22 B CHF
Bottom 50% share	5.8%	2.5%	9.6%
Middle 40% share	33.7%	30.2%	35.3%
Top 10% share	60.6%	67.3%	55.1%
Top 1% share	38.2%	42.5%	34.7%
Gini index	0.733	0.800	0.667

Source: own estimate.

Landau (1976) discusses the value of national income in interwar Poland. For the period 1923-25, 15 different estimations range from 4.8 billion zł to 14 billion zł. We present various estimates of national income in Poland in Table A.2. A strong majority of authors situate the

value of national income in the range of 6 – 11 billion zł. Authors use different methodologies, different data and do not comprehensively describe them. Therefore, we decided to discard the top and bottom estimates and use the mean of 13 middle estimates. We use 8.6 billion zł as the measure of national income to calculate the wealth-income ratio. If we combine this estimate of national income with the estimate of national wealth equal to 25 billion zł, the wealth-income ratio in Poland in the early 1920s stood at 2.90.

Wealth-income ratios for Poland and other countries for which we have data for the early 1920s are compared in Figure A1. According to the World Inequality Database in 1923 wealth-income ratio equaled 2.46 in France, 3.07 in the UK, 3.81 in Sweden, and 4.05 in the USA. Therefore the estimate of the wealth-income ratio for Poland (2.90) looks realistic. The wealth-income ratio in Poland was surely lower than in Sweden and the United States, which did not experience the destructive power of WW I. UK was also significantly richer and did not fight the war on its ground. To some extent, it is surprising that the wealth-income ratio in Poland is higher than in France, but we shall notice that in 1923 wealth-income ratio in France decreased suddenly from 2.9 in 1922 (in 1921 it was at 3.4, in 1920 at 4.0). It shall be noticed that after WW I wealth-income ratios in France and UK declined because of large increase in public debt during the war.

Table A2. Estimates of national income in Poland in years 1923-1925

Author	Value
Janicki (not indicated)	14.0
Tołwiński	10.0 – 12.0
P. Michalski	10.5
Bartel	10.0 -11.0
Łypacewicz	min. 10.0
Głębiński	10.0
Leliwa (Czechowicz)	9.5
Klarner	9
Battaglia	8.0 - 9.0
J. Michalski	8.0
Jaskólski	7.8
Stecki	7.0
Szturm de Sztrem	6.6
Krzyżanowski	6
Frostig	5.5
Rotenstreich	4.8

Source: own, based on Landau (1976). '

Figure A1. Wealth-income ratios
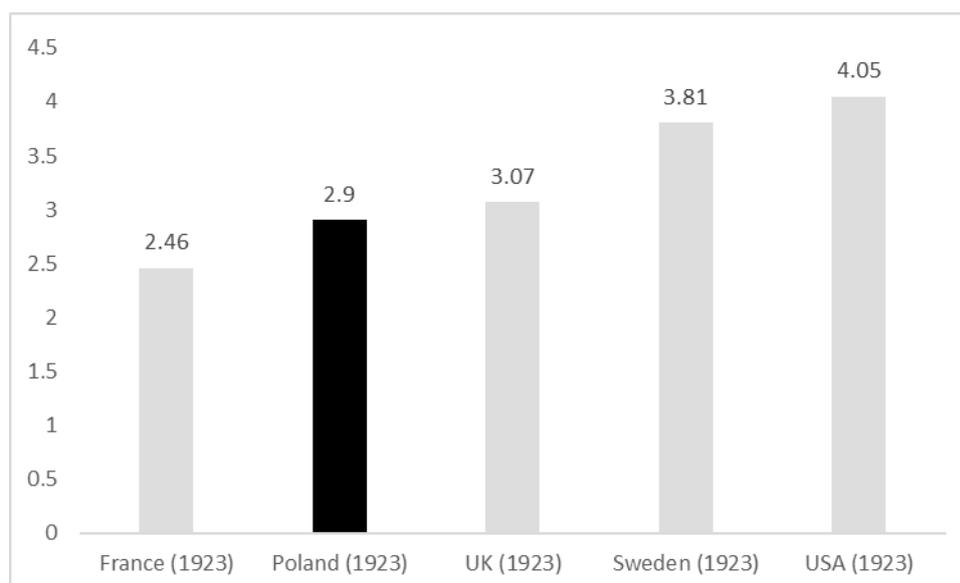
Source: for Poland our own estimate, for remaining countries World Inequality Database

A1.2 Report of the Treasury Committee of the Polish parliament on national wealth

The task of the Committee was the evaluation of the legislative proposal on extraordinary quasi-wealth, which was debated in the parliament in 1921. Although as explained in the paper, the quasi-wealth tax (payment in practice mainly dependen on other taxes paid by the taxpayer) did not succeed because of high inflation, the Committee reviewed various sources on the size and the structure of national wealth in Poland and adopted a report, which significantly extended the knowledge of national wealth. The Committee cooperated with the state's authorities, especially the Ministries of Agriculture, Industry, and Treasury. Although most of the statistical evidence used in the exercise came from the pre-WWI era, estimates of relative shares of agricultural and non-agricultural wealth (which was used to estimate the burden of quasi-wealth tax on different sectors of the economy) were assumed to be still valid.

The value of arable land, cattle, and agrarian equipment was assessed based on the evidence of the distribution of land (land tax was collected before WW I by partitioning powers) and land prices. The value of cattle and other animals was assessed based on the census data (a special census of agriculture was conducted). The value of agrarian equipment was estimated based on the assessment of the value of equipment used per unit of land.

The value of industry and trade was estimated based on the firm registry data, industrial tax data, and reports of companies listed on the stock exchange. Detailed data was available especially for the mining sector (coal, oil).

The value of the real estate in cities was estimated based on insurance statistics (compulsory fire insurance) and statistics provided by credit institutions, which collected data on real estate financed by them.

Treasury Committee obtained the following estimates of the value of different wealth components in national wealth:

1) Agricultural wealth - 66.3%
2) Industry and trade – 28.0%
3) Real estate (cities) – 5.3%

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Table A3. Wealth distribution [CHF]

	P 90	P 95	P 99	P 99.9	P 99.99
National level	2 884	4 712	13 830	105 104	671 148
former Russian parittion	3 331	5 223	14 978	118 781	664 162
Białystok	3 594	5 357	11 657	63 550	323 361
Kielce	2 837	4 565	10 054	81 226	495 597
Lublin	4 086	5 792	12 921	69 055	550 994
Łódź	3 531	6 258	21 358	195 207	1 068 852
Polesie	2 157	3 306	7 177	41 679	189 450
Warszawa	3 461	4 018	25 294	200 745	1 294 012
Wilno	2 437	4 018	12 146	65 178	254 180
former Prussian parittion	2 440	4 938	19 197	162 104	1 120 723
Pomorze	2 483	4 943	19 948	145 488	649 702
Śląsk	1 919	3 694	16 871	105 406	2 109 724
Wielkopolska	2 710	5 316	19 435	198 672	1 165 369
former Austrian partition	2 100	3 522	8 823	63 292	424 170
Kraków	2 528	4 255	12 200	87 113	578 859
Wołyń	3 681	5 365	11 860	65 268	353 781

Note: estimates of P90 < 3 000 shall be treated with caution.