

**From Soviets to Oligarchs:
Inequality and Property in Russia 1905-2016**
Appendix

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Appendix ***

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This appendix supplements our paper and describes the full set of data files and computer codes (NPZ2017.zip) that were used to construct the series.

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[Appendix A. National income and wealth accounts series](#)

[Appendix B. Income and wealth distribution series](#)

The zip file NPZ2017.zip includes the following files (in addition to the pdf files of the main paper and present appendix):

NPZ2017MainFiguresTables.xlsx : figures and tables presented in the main paper

NPZ2017NationalAccountsData.zip : all national accounts files

NPZ2017DistributionSeries.zip : all distribution series files

Appendix A. National income and wealth accounts series

Our detailed national income and national wealth series are presented in the file **NPZ2017AppendixA.xlsx**. This file includes a large number of tables presenting different breakdowns and decomposition of national income and national wealth by income and asset categories, following SNA 2008 concepts and the distributional national accounts guidelines of Alvaredo et al (2016). A general discussion about data sources, methodological and conceptual issues regarding national accounts is provided in the paper. The file includes more detailed explanations on how our series were constructed.

We also provide access to a directory including the raw material from official and non-official series that were used to construct these series (**NPZ2017NationalAccountsData**).

The zip file **NPZ2017NationalAccountsData.zip** contains both the .xlsx file with the detailed series and the raw material directory and is included in the zip file **NPZ2017.zip**.

All details about our computations and the way we used the various pieces of raw statistical data are given in the data files. Here we simply outline the main steps, references and assumptions behind the data construction. To be completed.

Appendix A.1. National balance sheets

Appendix A.1.1. Housing

The methodology that we use to estimate the market value of housing (residential structures and the underlying land) in Russia consists in combining the official statistics of the housing stock area with the house market prices (the comparison method). We proceed in two steps. In the first step we multiply the housing area by the relevant house prices. In the second step, we apply correction factors to account for potential composition biases in the house prices.¹ Finally, for the early 1990s we have assumed that the house prices evolved in relation to the general price inflation. The estimation is performed at the level of eight federal districts,² distinguishing in each between public and private dwelling stock, and further between urban and rural dwelling stock.

The corresponding annual data on the dwelling area (in square meters) in federal districts is found in the official publications of the Statistical Office of Russia (Rosstat) (e.g. *Zhilishchnoye khozyaystvo*, Statistical Yearbook of Russia, etc.; for 1990 from World Bank 1995, Tab. 3.8). Rosstat has been also publishing average selling prices of new and existing dwellings (per square meter) on the quarterly and annual basis. Realized market prices have been collected in administrative centers and larger cities.

In step 1 we multiply prices of the existing dwellings by the housing stock area – in each federal district for private and public housing, distinguishing further between urban and rural housing. However, several adjustments were required. In order to account for the potential composition bias we have applied 0.85 of reported housing

¹ Namely, that the dwellings which have been sold might not be representative of the total housing stock, for example if the market transactions are more prevalent on particular locations (e.g. city centers) or for dwellings of the certain quality standard.

² The Russian Federation is administratively divided into eight federal district: Central Federal District, Northwestern Federal District, Southern Federal District, North Causcas Federal District, Volga Federal District, Ural Federal District, Siberian Federal District, Far Eastern Federal District

prices to the private urban dwelling area and 0.65 to the public urban dwelling area.³ Next, the rural house prices are taken as 0.4 of reported housing prices in particular districts. Obviously, a move from the realized market transactions of dwellings to the total housing value has been the most difficult step in our estimation procedure, potentially accompanied with many uncertainties (Palacin and Shelbourn 2005).

Fortunately, we can compare our results to several alternative estimates. Most importantly, Rosstat (2014a, Table 12) has published market value of the private housing in Russia in the 2002-2012 period – as a part of methodological paper for the calculation of imputed owner-occupier rents. Rosstat uses conceptually equivalent methodology,⁴ but it is nonetheless remarkable that the two estimates are so close to each other, suggesting that we have managed in large part to minimize composition bias by controlling for the regional price variation and the urban-rural price differential. The current revision of the series, where we match regional house prices of dwellings of different quality⁵ to the corresponding census figures, will hopefully further improve the accuracy of our estimates. But, above all, we hope that in the near future Rosstat will start publishing official housing series as a part of national balance sheets, including both private and public housing. Another available estimate is Yemtsov (2010) for the private housing in Russia in 2003. Yemtsov estimates housing value by capitalizing market rent. The figure he obtains - 175% of the national income in 2003 - is again very close to our estimate (185% of the national income). Overall, our housing series display plausible orders of magnitude that are in line with the available alternative estimates. All series are presented in **NPZ2017AppendixA.xlsx**.

Finally, nationally representative house prices are available since 1996. This is clearly related to the fact that only by the mid-1990s the privatization of the housing

³ We have thus assumed that the urban public housing has been located on less favorable locations, or has been of inferior quality than the urban private housing stock.

⁴ Rosstat (2014a, p. 21) explains the methodology as follows: "The calculation of the market value of residential buildings was carried out by multiplying the corresponding area of residential buildings, distributed according to two criteria - according to the material of the walls and the year of construction - by the respective prices, separately for apartment houses and individual houses. The calculation was carried out separately for urban and rural settlements." (authors' translation from Russian)

⁵ Distinguishing between low-quality dwellings, medium-quality dwellings, high-quality dwellings, and luxury dwellings.

stock provided sufficiently large reservoir of housing units on the market. Private ownership was quite limited in urban areas during the Soviet era. Still in 1990 almost 80 per cent of the urban housing stock was in the state ownership (see Statistical Yearbook of Russia). Accordingly, sporadic evidence of house prices in larger cities in the early 1990s (e.g., Kosareva et al. 2000, p. 166;⁶ Daniell and Stryuk 1997) are not representative for the country as a whole. These indicate very high prices, which should be related to the very low supply and to large extent comprised real estate transactions for the commercial use (World Bank 1995, p. 28).

Our strategy has been instead to assume that house prices between 1990 and 1995 evolved in relation the general price inflation. In a paucity of (often contradictory) price information, we believe that the most robust evidence of the house price evolution in the first transition years in Russia, and Eastern Europe in general, has been that house prices outpaced to a certain degree the general price inflation (Stryuk 1996; Kosareva et al 2000, Tab. 3.12; Palacin and Shelburn 2005). In the immediate post-socialist hyperinflationary environment, the housing preserved its real value (World Bank 1995, p. 30; Kosareva et al. 2000). Indeed, indirect evidence suggest that the proportionally higher rise of house prices to the consumer prices stimulated housing purchases and investments, which served as a hedge against the rampant inflation that virtually wiped out all financial saving. This could have additionally motivated many Russians with tenancy rights to privatize flats (ibid.).

We have assumed that house prices outpaced consumer prices by 2%, and applied it backwards to 1990. The resulting housing value increases from 110% of the national income in 1990 to 240% of the national income in 1996. The estimate for 1990 can be compared with the official Soviet housing estimate based on replacement costs.⁷ Official estimates are of magnitude between 80-90% in the 1980s, thus not far removed from our benchmark (moreover, there is an indication of the bias in the direction of underestimation, as the Soviet methodology for housing remains to large extent elusive regarding the housing coverage and details of pricing (Moorsteen and

⁶ Based on the data of the Russian realtors guild.

⁷ Dwellings (excluding underlying land) were a part of the so-called non-productive assets in the Soviet wealth accounting (e.g. Nesterov 1972). We assume, following Goldsmith (1965, 1985), that the land underlying dwellings is equivalent to 30% of the value of dwelling structures.

Powell 1966; Powell 1979)).⁸ But, obviously, there is no compelling reason that the two measures should tally in practice, especially in the socialist economy.⁹ However, all indicators substantiate the finding of a strong increase in housing value in the early 1990s. This was a universal phenomenon,¹⁰ as Kosareva et al. (2000, p. 166) note, “no matter whether it was a standard residential property or a higher-quality property with an improved plan, custom design, and better location”. The emergence of real estate market implied that market forces acted on widespread distortions in prices and urban patterns (Bertaud and Renaud 1997; World Bank 2001)¹¹. The location especially came to play the main role with the marketization of residential land. Broadly speaking, the development of housing in Russia and Eastern Europe could be seen as a part of the global trend documented for developed countries (Knoll et al. 2014; Piketty and Zucman 2014).

Appendix A.1.2. Agricultural land

The agricultural land market is still very underdeveloped in Russia. More than twenty years after the abandonment of the Soviet state-run agriculture and the turn to the private market-based agriculture, the huge potential of the Russian agriculture has been largely unexploited. As a result, the data on agricultural land market transactions is scarce, making in turn the estimation of market value of agricultural land a particularly challenging task.

⁸ The capitalization of rent is not meaningful since the ‘social’ rent was heavily subsidized (it made less than 5% of household income; it remained fixed since 1929) (Morton 1980). See Alexeev (1991) for the attempt to estimate market house rents in the Soviet Union.

⁹ Theoretically, in market equilibrium replacement costs should equal market house value (DiPasquale and Wheaton 1992; Jaffee and Kaganova 1996)

¹⁰ The replacement values of housing saw equally sharp rise with the virtual explosion of construction material prices, much higher in magnitude than had been the rise of consumer prices (World Bank 1995, p. xix).

¹¹ A peculiarity exhibited by socialist cities is lower densities in city center than on the urban periphery (Bertaud and Renaud 1997).

In the absence of official estimates of the land value in Russia, we pursue the comparison method as applied above for the housing, which consists in multiplying the land area by the relevant current market prices. However, in contrast to the housing exercise, where we had at our disposal unusually detailed and reliable house prices, the market prices of the agricultural land are practically non-existent.

Due to the specific character of the agricultural land privatization in Russia, and the subsequent developments (see below), land leasing has been the predominant form of market transactions involving land, while the land sales account for a very small share of the market activity in Russia. Namely, privatization of agricultural land in Russia proceeded by transferring in the early 1990s the state-owned agricultural land into the joint ownership of farmers on former collective and state farms (*kolkhozes* and *sovkhozes*)¹² (the so-called Nizhny Novgorod model; Wegren 1998). Farmers were granted land shares, representing paper claims on a piece of land in the joint shared ownership (without actually allotting specific physical plots, but with the right to eventually convert a share into the physical plot in the individual ownership) (Lerman and Shagaida 2007, p. 21). Most farmers-shareowners have chosen to leave the land in the joint shared ownership and to lease out their shares, largely to corporate farms (former collective and state farms that have been incorporated in the meantime). The large agricultural enterprises farm today most of the agricultural land in Russia (Lerman and Sedik 2013, Tab 22.5).¹³

As a result of the privatization, the ownership of the agricultural land has markedly changed since the Soviet era, when the land was entirely in the state ownership. Today almost two-thirds of the agricultural land is in the private ownership and one-third in the state ownership. Close to 90 percent of the privately owned agricultural land (more than 50 of the total agricultural land) is owned through land shares, and the remaining modest share in the form of demarcated land plots (Lerman and Shagaida 2007, p. 16). A conversion of land shares into the physical plots in the individual ownership is rather cumbersome and expensive procedure, hampered by

¹² The restitution to previous owners, as practised in many other ex-communist countries in Eastern Europe, was not considered due to the longer time passed since the forced collectivizations and land expropriations in Russia.

¹³ According to the 2006 agricultural census, the large enterprises in Russia cultivate on average 11,846 ha. For comparison, the average size of the very large farms in the US is around 863 ha (Lerman and Sedik 2013, Tab. 22.8)

numerous administration constraints.

Accordingly, one needs to take into account both land leasing and land sales transactions in order to assess the value of the agricultural land. The official statistics is quite detailed with respect to leasing and sale of the state-owned land. Both transaction volumes and prices are annually published.¹⁴ On the other hand, the information is very limited for market transaction between individuals.¹⁵ We conduct two variants to estimate value of the agricultural land. First, we use the selling prices of the state land at auctions, in particular for the land sold to peasant farms and agricultural enterprises.¹⁶ The value of agricultural land is obtained by applying these prices to the land area. Prices are available at the federal district level.¹⁷ The second variant applies the official cadastral land value (per ha) to land area. Rosstat stipulates the latter approach¹⁸ in the official methodology for the estimation of the market value of the agricultural land (*Metodologicheskiye rekomendatsii po otsenke zemli*).¹⁹ Both variants give similar land values, but we follow the latter as it compatible with the official methodology (and hopefully, soon to be available official land estimates). Furthermore, we believe that the cadastral valuation – however imperfect proxy for the actual market values – is at the moment the preferable appraisal of the agricultural land value at the macroeconomic level in Russia, in the first place due to its exhaustive regional treatment of the huge and highly heterogeneous Russian agricultural land area. For the 1990s we have assumed that

¹⁴ In the annual publications of Rosreestr (Federal Agency for State Registration, Cadastre and Cartography): *State (National) Report "On situation with and utilization of land in the Russian Federation"*

¹⁵ The number of transactions is published in the official statistics, but, as Lerman and Shagaida (2007, p. 16) point out, this makes a negligible part of the actual activity, since individuals predominantly do not register land transactions. Moreover, buying and selling of land was prohibited until the passing of the Agricultural Land Market Act in 2003. Prices of land transactions between individual are not available. A complete lack of any public information on market land prices has been often indicated as one of the chief obstacles for the development of the functioning land market.

¹⁶ Namely, the Rosresstr statistics do not distinguish separately sales of agricultural land in the total land. Since important part of the land transactions involves the sale for construction use (for individual housing or dacha construction).

¹⁷ Clearly, selling prices of the state agricultural land can be removed from market prices, and due to various (political, social or cultural) reasons poorly reflect an actual supply and demand relationship. In principle, the state land should be sold at the prevailing market price, but this is not possible in practice due to a lack of the established market prices.

¹⁸ Yet, we are not aware of the actual land estimates produced by Rosstat.

¹⁹ Thus, Rosstat notes in *Metodologicheskiye rekomendatsii* that cadastral value should be based on the market values. Rosresstr generally assessed land values by discounting lease payments. It applies 33 years as the payback period (Rosreestr 2015).

the land value moved in line with the price index of agricultural products.

The resulting series display very low value of agricultural land in Russia – less the 20% of national income today. These values are consistent with the sporadic evidence on land prices, suggesting extremely low value of the agricultural land in Russia. As noted, prices of land leases – as the predominant form of market transaction – are the most important in aggregate. The most relevant evidence on lease prices in transactions between individuals is the BASIS survey (Lerman and Shagaida 2007), carried out in three regions representative of the advanced, intermediate and backward agricultural production (respectively, Rostov, Nizhny Novgorod and Ivanovo). According to the survey, a price of the lease per hectare per year ranged between 350-450 rubles in 2003. For example, by applying the same payback period (an inverse of the capitalization rate) of 33 years (as used for the cadastral valuation) in order to move from land lease to market price, we arrive at the market price very close to the one we use.²⁰

The principal reason for the low value of agricultural land in Russia is very low or non-existent demand. The transformation of the Russian agriculture proceeded with series of shocks. Artificially large Soviet agriculture suddenly shrank with the removal of subsidies and the rise of input costs after price liberalization (Liefert and Swinnen 2002). It was accompanied by the exodus of the population from the agricultural sector, leaving much land idle, frequently turned to the construction use or into wastelands. Besides, the rural population in Russia is much poorer on average (it was among the lowest income strata during the Soviet Union; McAuley 1979). It is poorly informed, faced by numerous administration barriers, lacking necessary financial means, with no access to bank credit, etc. All this discourages serious engagement in the agricultural activity.

Finally, imperfect property rights are the factor substantially limiting demand for the agricultural land. Privatization has created large strata of holders of land shares that in effect do not have full control over the land. Without doubt, the agricultural land – as no other component of the national wealth – encapsulates a peculiar history of the property relations in Russia. From communal land tenure in the tsarist Russia to the Soviet forced collectivization, Russia pursued different development path than

²⁰ Obviously, assuming the appropriate capitalization rate is a very delicate issue.

Western Europe. Moreover, to many observers, loose property rights in agriculture in the post-Emancipation period revealed the fundamental gulf between Russia and the West²¹ (see Dennison 2011 for the comprehensive overview). The so-called ‘peasant myth’, as famously outlined by the Russian agricultural economist Chayanov (1966), has endured to this very day, frequently casting doubt upon the adaptability of the Russian village to the market-based agriculture with profit-maximizing agents and clearly defined property rights.²² On the other hand, Gerschenkron (1962) provides the classic statement of the so-called institutional argument, according to which the Russian fundamental ‘otherness’ is rather a result of the specific historical institutional development in Russia, which adversely affected labour mobility (e.g. peasant immobility during tsarist period; urban immobility (*propiska*) during the Soviet era, etc.) and in turn the property rights development (Dennison 2011). More generally, it has been perceived as the main cause of the Russia’s economic ‘backwardness’. Accordingly, the lesson for today is that the improvement in the agricultural institutional and legal framework is a requisite for the successful development of the Russian agriculture.

Appendix A.1.3. Other domestic capital

We define other domestic capital as all non-financial assets excluding the housing and the agricultural land. It comprises the non-financial assets of the corporate sector, the public infrastructure, capital of small proprietors, etc. As a starting point in our estimation approach, we use the official Rosstat’s estimates of the fixed capital stock available for the 2011-2015 period, produced in compliance with the SNA 2008 standard. In particular, Rosstat has published fixed assets classified by categories of dwellings, other (non-residential) buildings, constructions, machinery and equipment, means of transport and other fixed assets. Both gross and net of depreciation values

²¹ For example, contrasting the collectivistic spirit of the Russian (peasant) to the western individualism. This view was propagated by the literary giants, such as Herzen or Tolstoy (Dennison 2011).

²² Gregory (1994, p. 54) thus notes that the Soviet leadership justified its reluctance to return to the private agriculture in the late 1980s by alluding to the presumed failure of the private agriculture in the post-emancipation period of the tsarist Russia or during the New Economic Policy (NEP) period (1921-8). Gregory (1994) shows both of these assertions to be wrong.

are provided. In order to obtain estimates for years prior to 2011, we have used the perpetual inventory method (PIM). Specifically, we start from the net stock of fixed assets in 2011 and apply backwards the gross fixed capital formation series in constant 2011 prices adjusted for the consumption of fixed capital.

Gross fixed capital formation series are available from the national accounts for the following four types of fixed assets: i) dwellings; ii) non-residential buildings and structures; iii) machinery and equipment, and means of transport; iv) other fixed assets. We initiate PIM by taking 2011 stocks for asset types from ii until iv.²³ Consumption of fixed capital for each type of fixed asset is estimated by multiplying the inverse of the expected service life by the gross fixed capital stock (assuming thus straight-line depreciation profile). For non-residential buildings and structures we assume the average expected service life of 55 years, for machinery and equipment 13 years (Erumban and Voskoboynikov 2014). These assumptions are found to be consistent with the official data available for 2011-2015. Finally, thus obtained net fixed capital series in constant prices is converted into current prices using the appropriate price indices specified by Rosstat: 'the producer price index in construction' for non-residential buildings and constructions; 'the acquisition price index for machinery and equipment of investment purpose' for the machinery and equipment. The land underlying non-residential buildings is taken as 20 per cent of the net value of structures. The value of inventories is taken from the enterprise annual survey (*Finansi Rossi*).

Unfortunately, Rosstat does not provide sectoral composition of the fixed capital. Instead, the sectorization of the other domestic capital between corporate, household and government sectors has been approximated as follows. First, the other domestic capital in the government ownership is taken as reported in the *IMF Government Finance Statistics*.²⁴ The remaining part is divided between the corporate and the household sector in the way that the other domestic capital of the household sector (largely capital of small businesses) is taken as rising from the mid-1990s until today from 0.1 to 0.15 of the total net other buildings and structures and from 0.1 to 0.2 of the machinery and equipment. The residual value is attributed to the corporate

²³ We also estimate dwelling stock in this way in the attempt to distinguish between structures and the underlying land for the housing component (see section A.1.1)

²⁴ The data has been prepared by the Russian Treasury and it is also available at its website.

sector. Note that the non-financial capital of corporations is included in the so-called book-value national wealth, while in our benchmark market-value national wealth series corporations are valued instead through their equity. See the next section for more details.

The value of the other domestic capital in 1990, which is our benchmark year for the Soviet period, is taken from the 'balance of fixed assets' statistics (one of the four main 'balances' under the Material Product System (MPS); Arvay 1994; Nesterov 1972, 1997). The method was based on annual surveys of enterprises' and government organizations' balance sheets, using as starting points periodic general censuses of the total capital stock undertaken in the socialist countries (in 1960 and 1973 in the Soviet Union) (Goldsmith 1965, 1985; Moorsteen and Powell 1966; Powell 1979; Kaplan 1963).²⁵ The figure for other domestic capital in 1990 based on this source should be seen as reliable due to the comprehensive coverage of the capital, made possible by the centralized reporting system of the Soviet command economy. And plausibly it should be preferred to the backward application of PIM outlined above, due to the very large uncertainty regarding both price and investment series ²⁶ during the chaotic period in the early 1990s (hyperinflation, mass privatization, large-scale capital retirements, etc.). The series for fixed assets are reported in Statistical Yearbooks (*Narhoz*), in 1973 prices (Soviet estimate prices), which we convert to current prices using the appropriate price indices for construction works and for wholesale machinery and equipment.²⁷ The constructed series for fixed assets for the 1960-1990 period are included in **NPZ2017AppendixA.xlsx**.

²⁵ The method is conceptually akin to PIM, using the year of the general inventory as the benchmark year.

²⁶ It is also not feasible due to a lack of investment series by the fixed asset type for the early 1990s.

²⁷ For machinery and equipment we use the alternative western price index constructed by Becker (1974), CIA (1979) and Trembl (1991), due to the well known hidden inflation in the wholesale machinery prices. The widespread practice in socialist economies was to simulate the "new product" by making minor adjustments to the existing ones rather than raise administrative prices.

Appendix A.1.4. Financial assets and liabilities

The Bank of Russia has published complete Financial Accounts and Financial Balance Sheets of all institutional sectors for 2011-2015. These are fully in compliance with SNA 2008. In order to reconstruct sectoral financial balance sheets for the period 1990-2010 we rely on various official sources, in the first place on the official monetary statistics of the Bank of Russia. First we look at the financial assets (exclusive of equity and investment fund assets) and liabilities of the household and government sector.

Appendix A.1.4.1. Household financial assets and liabilities

Currency and deposits has been traditionally the most important financial asset of the Russian households. In the Soviet Union it was basically the sole saving alternative available to the population (in addition to limited residential investment). Russian households started the transition with the substantial value of deposits and currency holdings, equivalent to almost 80 per cent of the national income, largely as a result of the (forced) saving amid limited consumption opportunities in the shortage economy of the Soviet Union (the so-called “ruble overhang”). But this was wiped out in only few years by the rampant inflation of the early 1990s. In the course of the following two decades, households have accumulated deposits and currencies equaling around 40 per cent of national income. Other types of financial assets, such as holdings of debt securities, have played very limited role in the portfolio of Russian households.²⁸

The data on household deposits before 2011 (inclusive of the Soviet period) is available in the official publications (e.g. Statistical Yearbook of Russia; *Sotsial'noye polozheniye i uroven' zhizni naseleniya Rossii*, etc.). Currency held by households is estimated as 75 per cent of the cash in circulation (monetary aggregate M0).

²⁸ Goldsmith (1965, p. 89), for instance, notes that population's holding of government bonds in the Soviet Union could be hardly claimed as private ownership since they are “are frozen, without interest and without definite repayment date”.

On the other hand, the Russian households entered the transition with negligible debt burden. Goldsmith (1965, p. 89) thus noted as “the outstanding feature of...financial relations [in the Soviet Union] the virtual absence of the debt of the household sector”. With the high inflation of the early 1990s, this modest debt was eliminated along with the private financial assets. Since then, the household debt has risen quite moderately. In particular, the low housing affordability has prevented any substantial rise in mortgages (the housing was generally acquired through free privatization). The housing loans account thus for less than a third of the total loans of Russian households. The data on household debt can be found in the official monetary statistics.

Appendix A.1.4.2. Government financial assets and liabilities

Financial balance sheets of the government sector are reconstructed using various official sources. First, the general government deposits in the central bank and credit institutions is documented in the financial survey of the Bank of Russia. For the 1990, we take government deposits in Gosbank (*Narhoz* 1990). This category has comprised to large extent assets of the Stabilization fund until 2008, and after its split the National Welfare Fund and the Reserve Fund. Other government assets are taken from *IMF Government Finance Statistics*.

A detailed data is available for the domestic and external government debt. Domestic debt in form of credit lines or debt securities (Government Short-Term Bonds (GKO) and Federal Loan Bonds (OFZ)) is found in monetary statistics. In 1990 domestic government debt referred to the debt to Gosbank (*Narhoz* 1990) (moreover, the credit to the government made the largest asset item of the Gosbank’s balance sheet). External debt before 1992 is taken from Fischer (1992).

Appendix A.1.4.3. Equity assets

The data on the capitalization of the equity market in Russia is used as the

benchmark to estimate total equity assets of Russian institutional sectors prior to 2011. The market capitalization of the Russian equity market in recent years makes on average 70 per cent of equity assets held by household, government and foreign institutional sectors as reported in the Financial Accounts. By extension, the remainder pertains to unquoted shares and equity of limited liability companies and partnerships, which the Bank of Russia values by the book value of equity liabilities. Our approach has been to assume that households, the general government and the rest of the world directly own the total value of listed corporations represented by the stock market capitalization (we disregard thus cross-ownership between corporations). The information on the capitalization of the Russian equity market is available from *Naufor Factbook* or *the World Bank Development Indicators*. We add to this the value for the non-listed entities approximated as 30 per cent of national income throughout years.

This figure is divided between the household, the government and the rest of the world sector as follows. The equity of the rest of the world in Russian corporations is taken from the international investment position. It is consistent with the amounts reported in the Financial Accounts for the recent years. For private and government equity holdings we keep the proportions documented in the Financial Accounts for the recent years.

Appendix B. Income and wealth distribution series

Our detailed income and wealth distribution series are given in the zipped directory **NPZ2017DistributionSeries.zip**. This directory includes our final benchmark distribution series NPZ2017FinalDistributionSeries.zip, as well as alternative series and the complete computer codes and all detailed computations and raw material (household survey tabulations, income tax data, billionaire data) that we used to construct these series. For more details on the organization of these files, see ReadMeNPZ2017DistributionSeries.doc. The main robustness checks and variant series are presented in **NPZ2017AppendixB.xlsx** and are summarized on Figures B1-B57, which we briefly describe below.

Appendix B.1. Income distribution series

The general methodology that we use in order to construct our income distribution series is summarized in the main paper (section 2.2.1). It basically consists of three steps: in step 1 we use raw household income survey tabulations and generalized Pareto interpolation techniques (Blanchet, Fournier and Piketty, 2017) in order to estimate raw series on the distribution of raw survey income and raw fiscal income by g-percentile (before any correction); in step 2 we use high-income-taxpayers income tax data in order to correct upwards these estimates and obtain corrected estimates of the distribution of fiscal income by g-percentile; in step 3 we use national accounts and wealth data in order to include tax-exempt capital income data (such as undistributed profits, imputed rent and other “non-fiscal income”) and to obtain corrected estimates of the distribution of pre-tax national income by g-percentile. All details are provided in the data files and computer codes. Here we discuss a number of additional issues about variant series and robustness checks.

This methodology in three steps mirrors that used in the case of China by Piketty-Yang-Zucman (2017), with a number of important differences. As explained in the main paper (section 2.2), the main difference is that we need to make assumptions about the profiles of “deduction rates” (i.e. the average bracket-level ratio of deductions to gross revenue) on the one hand, and “declaration rates” (i.e. the average bracket-level fraction of taxpayers submitting a declaration). The raw

tabulations by income bracket released by Russia's tax authorities for income years 2008-2015 are reported on Table B11 (see also Table B10 for aggregate statistics on Russia personal income tax). As one can see, there are typically about 5 million declarations each year (about 5% of adult population), including 0.5 million declarations over 1 million rubles in assessable income (gross revenue).

In our benchmark estimates, we assume a flat profile of deduction rate (same deduction rate for all brackets), and a rising profile of declaration rate (up to 100% for very high income taxpayers). This profile was chosen so as to deliver plausible levels of log-linearly-estimated Pareto coefficients (i.e. coefficients defined by $a_i = \log[(1-p_i)/(1-p_{i+1})]/\log[\text{thr}_{i+1}/\text{thr}_i]$). In effect, the raw data includes too many large declarations in the raw data as compared to the number of lower declarations, so that one needs to assume a fairly steep profile for the declaration rate in order to obtain plausible coefficients (i.e. a_i not too close to 1, and $b_i = a_i/(a_i-1)$ not too large: plausible inverted Pareto coefficient b_i are usually not higher than 3-4 at the very most, including in highly unequal countries).

We also provide variant series based upon alternative assumptions for the profile of declaration rates and deduction rates. The different profiles are reported in file NPZ2017AppendixB.xlsx, Table B13. All detailed results are presented in the subdirectory Gpinter and can be reproduced by using the WID.world/gpinter interface based upon generalized Pareto interpolation techniques (Blanchet, Fournier and Piketty, 2017). The Stata format do-file generating the fiscal correction is do_gpinter_RussiaRLMS. It is based upon piecewise-linear correction factors $f(p)$ above $p_0=0.9$ up to the percentiles p_1 , p_2 and p_3 corresponding to the assessable income thresholds 10 million, 100 million and 500 million rubles.

Generally speaking, our estimates show the impact of the wealth correction is much more limited than the fiscal correction (see Figures B20-B24). As a consequence, using alternative wealth inequality series (see below) to impute tax-exempt capital income has limited consequences on final income series (see Figures B30-B31). What is more relevant is the choice of the variant for using income tax declarations (see Figures B40-B42) (variants 2.2-2.5 correspond to different profiles for the

declaration rate, and variants 3.1-3.4 to different profiles for the deduction rate; the benchmark series correspond to variant 2.1).

Note however that the upward correction on raw survey inequality estimates is very large in all cases. The reason can be easily seen from the raw income tax tabulations, which indicate very high top income levels. Incomes reported on declarations represent about 28-32% of total assessable income and 8-12% of total taxable income (see Table B10). Given that most of the income comes from large declarations (from the tabulations one can infer that at least three quarters come the declarations over 1 million rubles), and that many middle-large declarations are missing (otherwise log-linear Pareto coefficients are simply too close to 1), it is not too surprising that tax data leads to a very substantial upgrade of top 1% income shares.

For years 2008-2015 we use our benchmark corrections, and we report on Figure B42 the corresponding inverted Pareto coefficients $b(p)$ estimated at quantile $p=0.9$ for the different variants. In effect $b(0.9)$ declines from 3.4-3.5 to 2.8 over the period 2008-2015 with variant 2.1 and takes intermediate values between variants 2.2-2.3 3.1-3.2 (less inequality) and 2.4-2.5 3.3-3.4 (more inequality). We report on Figure B43 our benchmark inverted Pareto coefficients that we use for the 1980-2007 period. All variants, computer codes and robustness checks are presented in the subdirector Gpinter in zipped directory NPZ2017DistributionSeries.zip.

Appendix B.2. Wealth distribution series

As explained in the main paper (section 2.2), the data sources at our disposal in order to estimate wealth inequality in Russia are very limited. Unlike in other countries, where we can use a combination of sources and methods, all we have in Russia at this stage is billionaire data. Therefore we proceed as follows.

First, we compute average standardized distributions of wealth for the US, France and China from WID.world series (that is, we divide all thresholds and bracket averages for all 127 generalized percentiles by average wealth, and we compute the arithmetic average for the three countries). We note that variations across countries

and over time in these standardized wealth distributions mostly happen above $p_0=0.99$. I.e. below $p_0=0.99$ the ratios of the different percentile thresholds to average wealth are relatively stable over time and across countries, at least as a first approximation (most of the variation seems to take place within the top 1%). Therefore we choose to use the same normalized distribution for Russia below $p_0=0.99$ as the average US-France-China normalized distribution.

The difficult question is to know how to link the distribution from $p_0=0.99$ to billionaire level, and also to make an assumption about the average number n of adults per billionaire family (sometime Forbes includes very large family groups in the same billionaire family, sometime it is just one individual or one married couple). We first re-estimate 127 generalized percentile within the top 1% of the normalized distribution in order to reach billionaire level. In our benchmark series we assume $n=5$ and a linear correction factor $f(p)$ from $p_0=0.99$ up to billionaire level (because this seems to work relatively well for the US, France and China).

We also variant series based upon alternative assumptions: $n=2,4,6,8$ instead of $n=5$, and also a piecewise linear $f(p)$ with a fraction $f=0,0.2,0.4,0.6,0.8,1$ of the total correction between $p_0=0.99$ and $p_1=0.999$ (and a fraction $1-f$ between $p_1=0.999$ and billionaire level). The results are presented on Figures B53-B56.

Finally, we also present variant series based upon the wealth rankings from Finanz magasin rather than Forbes. Finanz provide rankings for broader groups of millionaire than just billionaires (they typically cover 300-500 wealth Russians rather than 100 in Forbes at the end of the period), but they do not cover all years, and most importantly they seem to miss important segments of wealth holders in the bottom part of their list (the inverted Pareto coefficient seems unplausibly high, around 8-10, vs a more plausible 3-4 in Forbes rankings). The results are presented on Figure B57.

All variants, computer codes and robustness checks are presented in the subdirector GpinterWealth in zipped directory NPZ2017DistributionSeries.zip.

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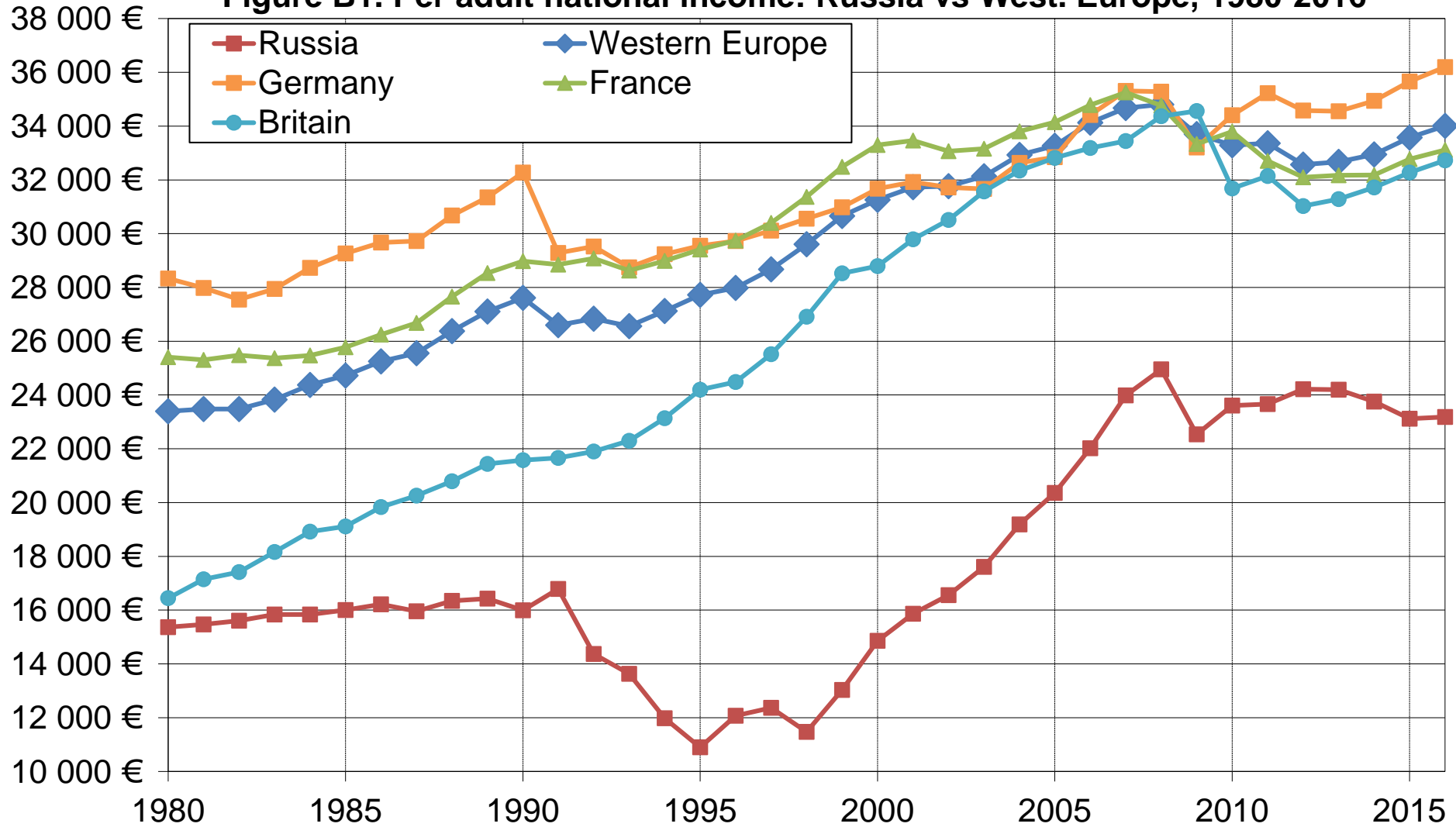
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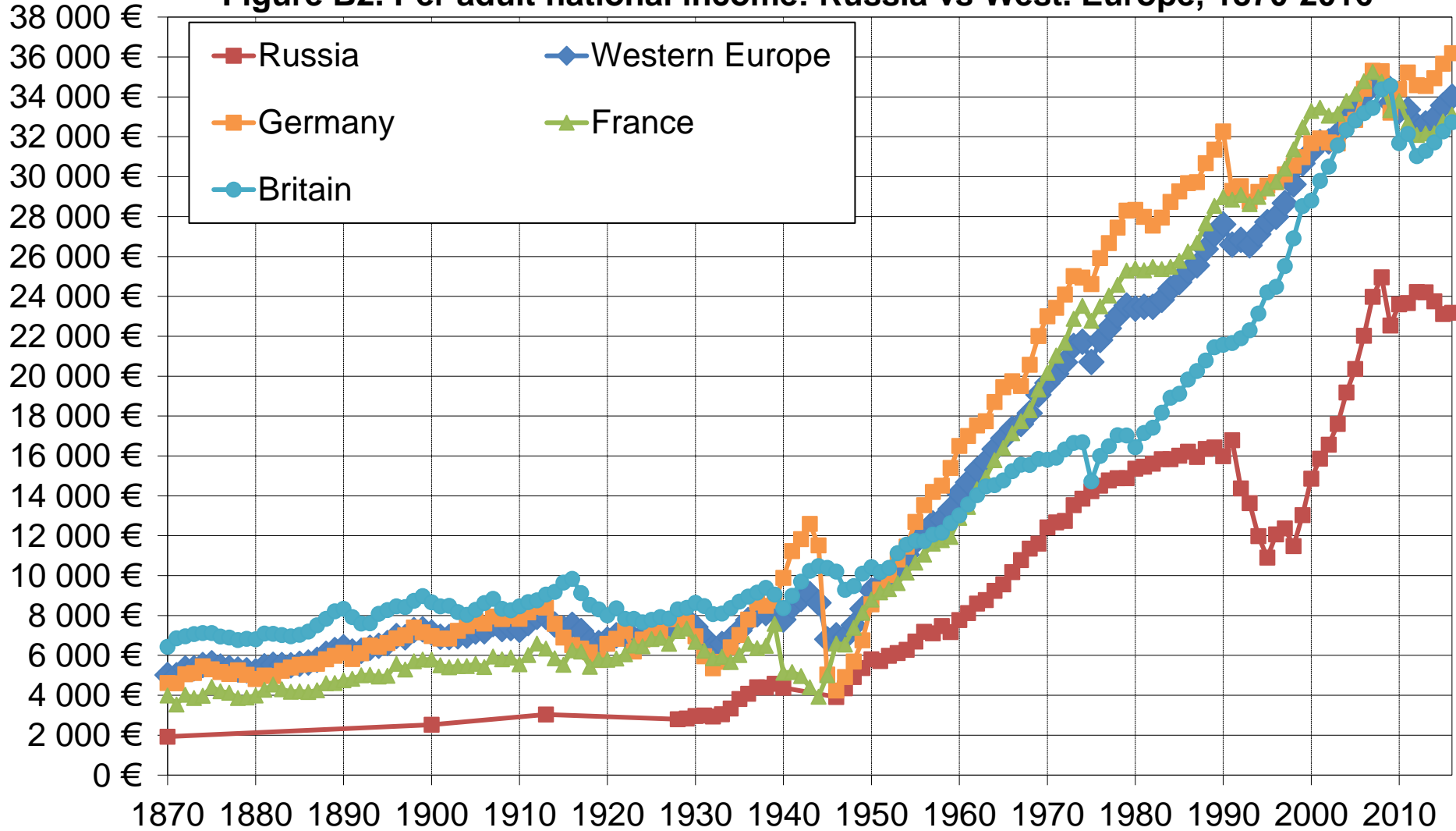
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Figure B1. Per adult national income: Russia vs West. Europe, 1980-2016



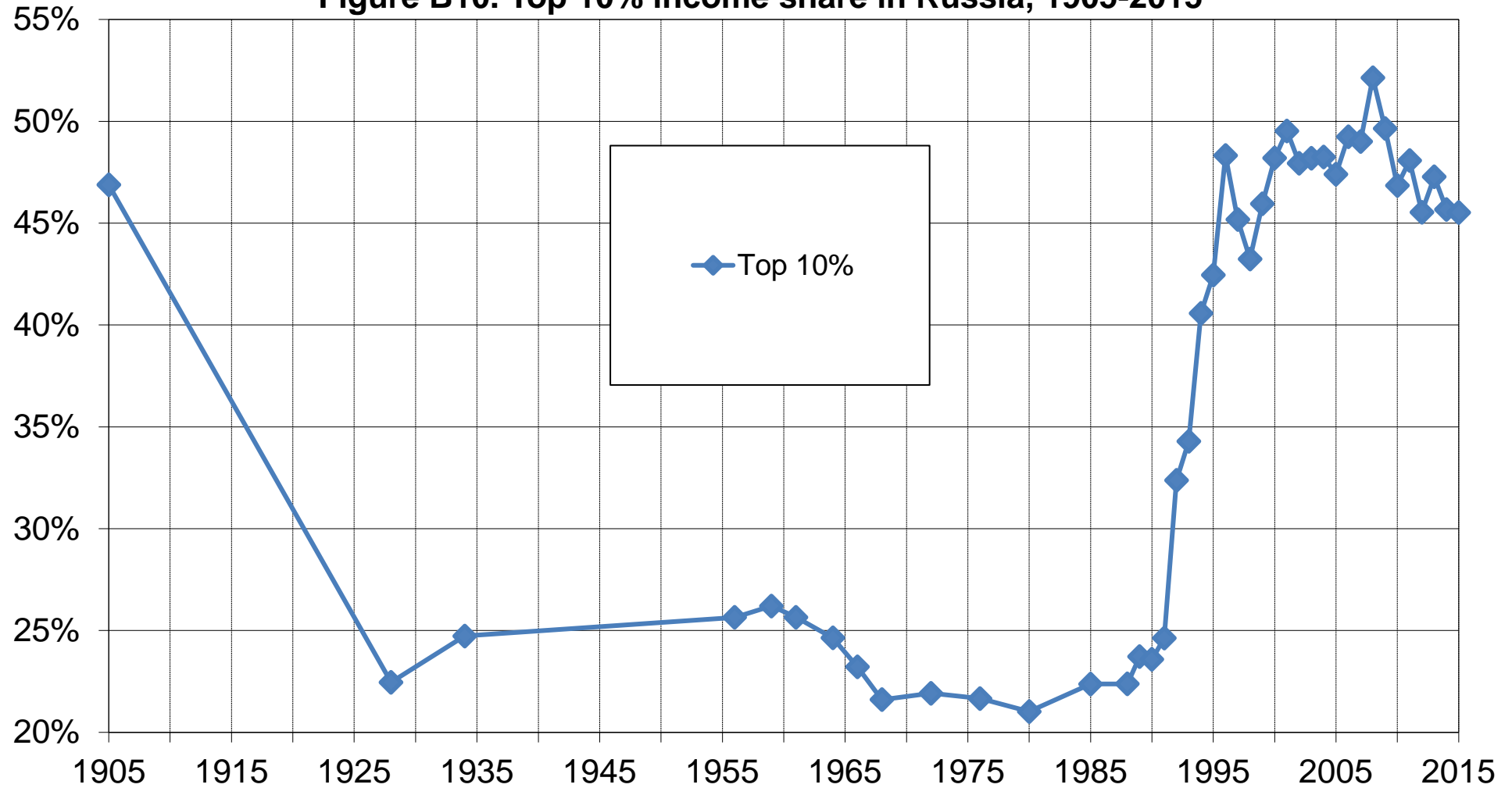
Per adult national income in euros 2016 PPP. Western Europe = arithmetic average Germany-France-Britain.

Figure B2. Per adult national income: Russia vs West. Europe, 1870-2016



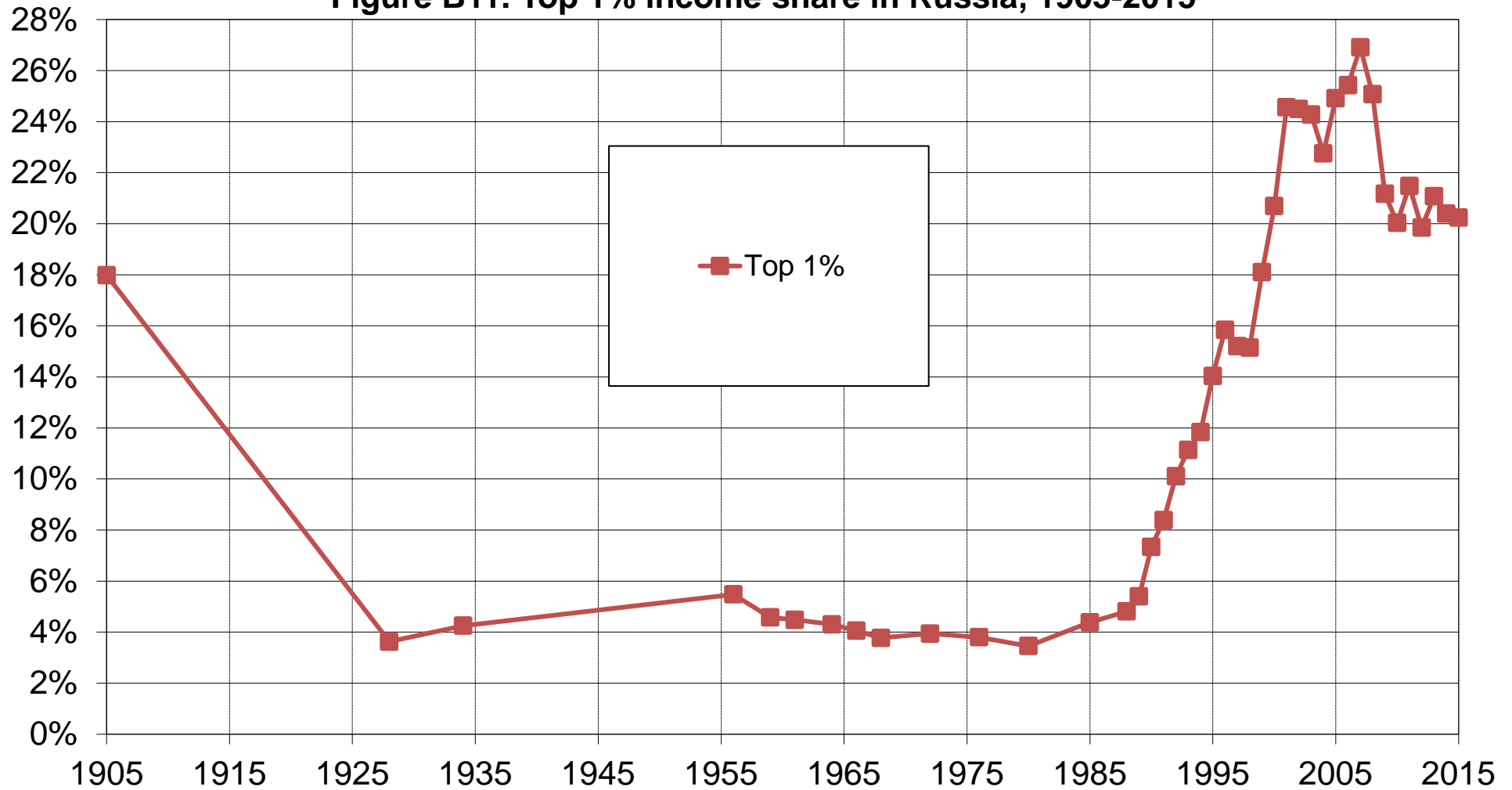
Per adult national income in euros 2016 PPP. Western Europe = arithmetic average Germany-France-Britain..

Figure B10. Top 10% income share in Russia, 1905-2015



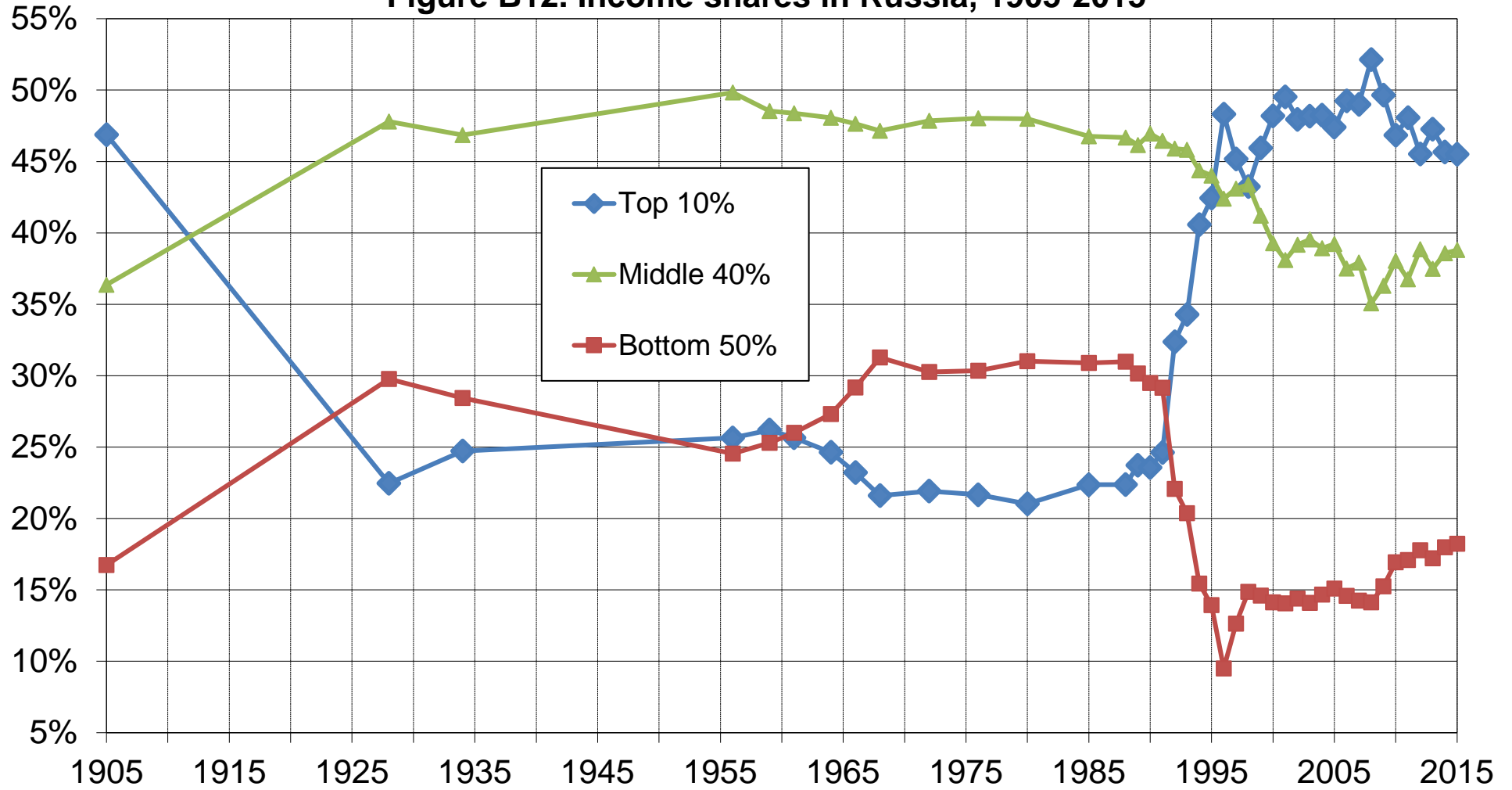
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among adults. Corrected estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data. Equal-split-adults series (income of married couples divided by two).

Figure B11. Top 1% income share in Russia, 1905-2015



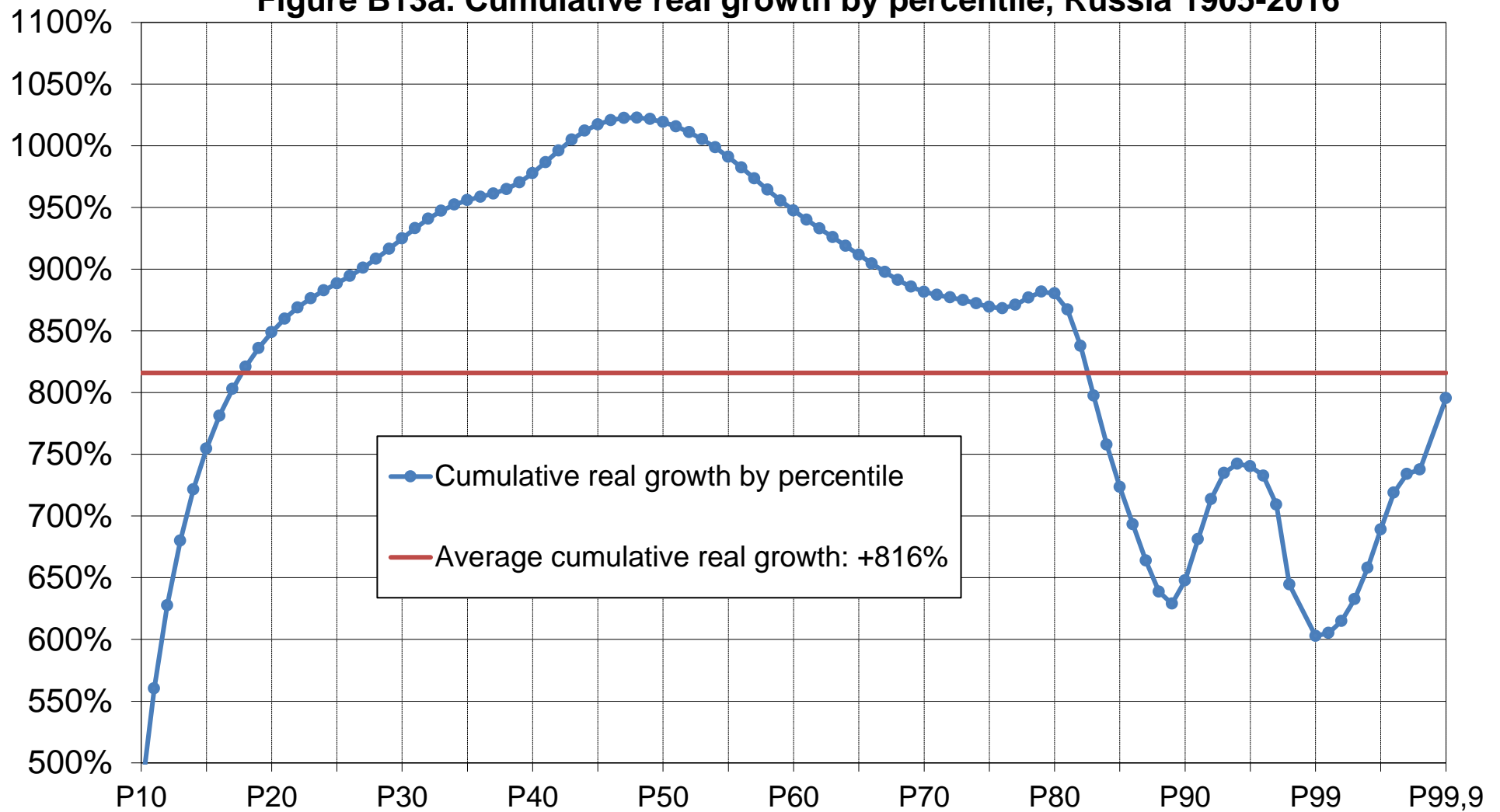
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among adults. Corrected estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data. Equal-split-adults series (income of married couples divided by two).

Figure B12. Income shares in Russia, 1905-2015



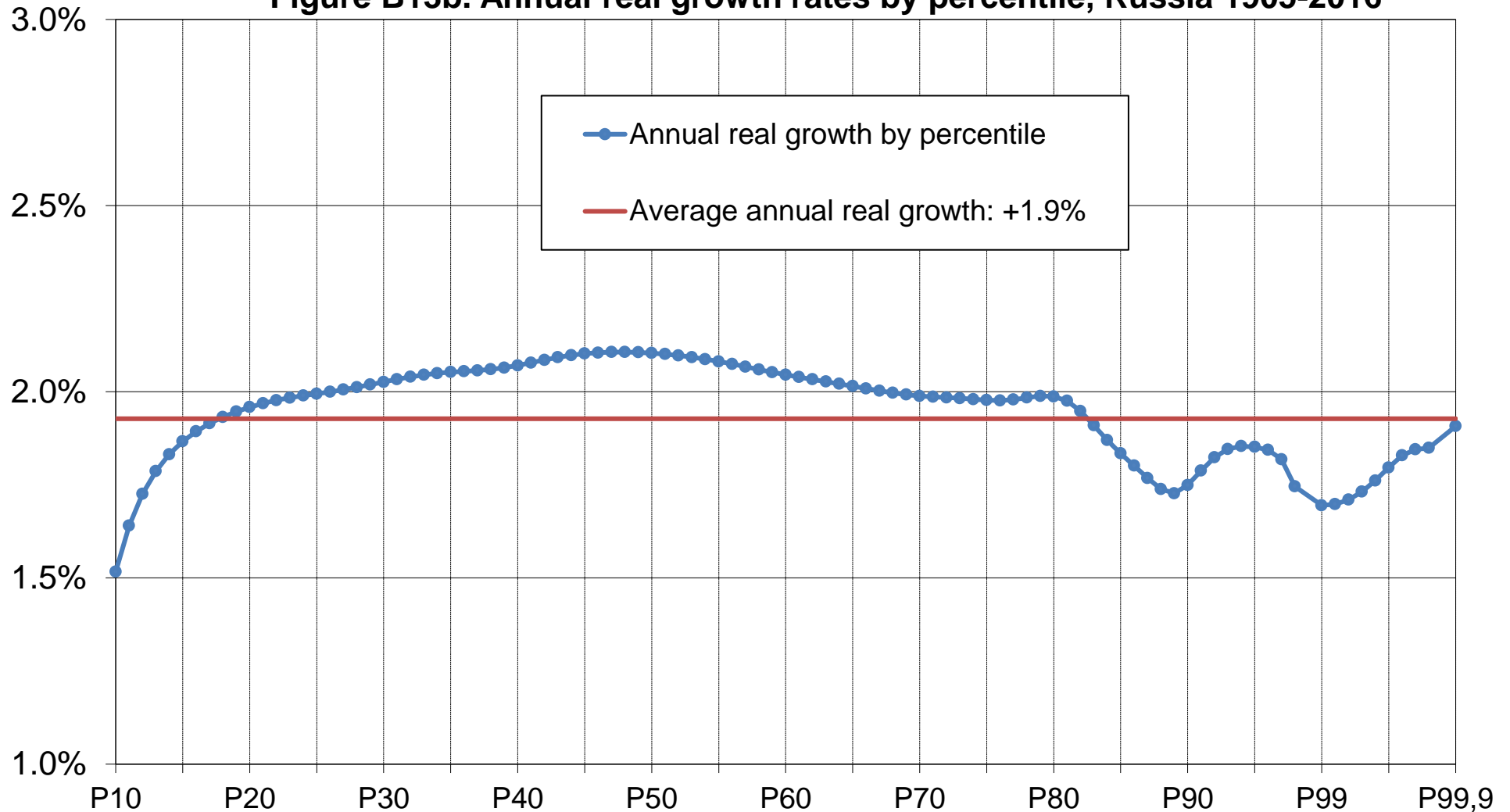
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among adults. Corrected estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data. Equal-split-adults series (income of married couples divided by two).

Figure B13a. Cumulative real growth by percentile, Russia 1905-2016



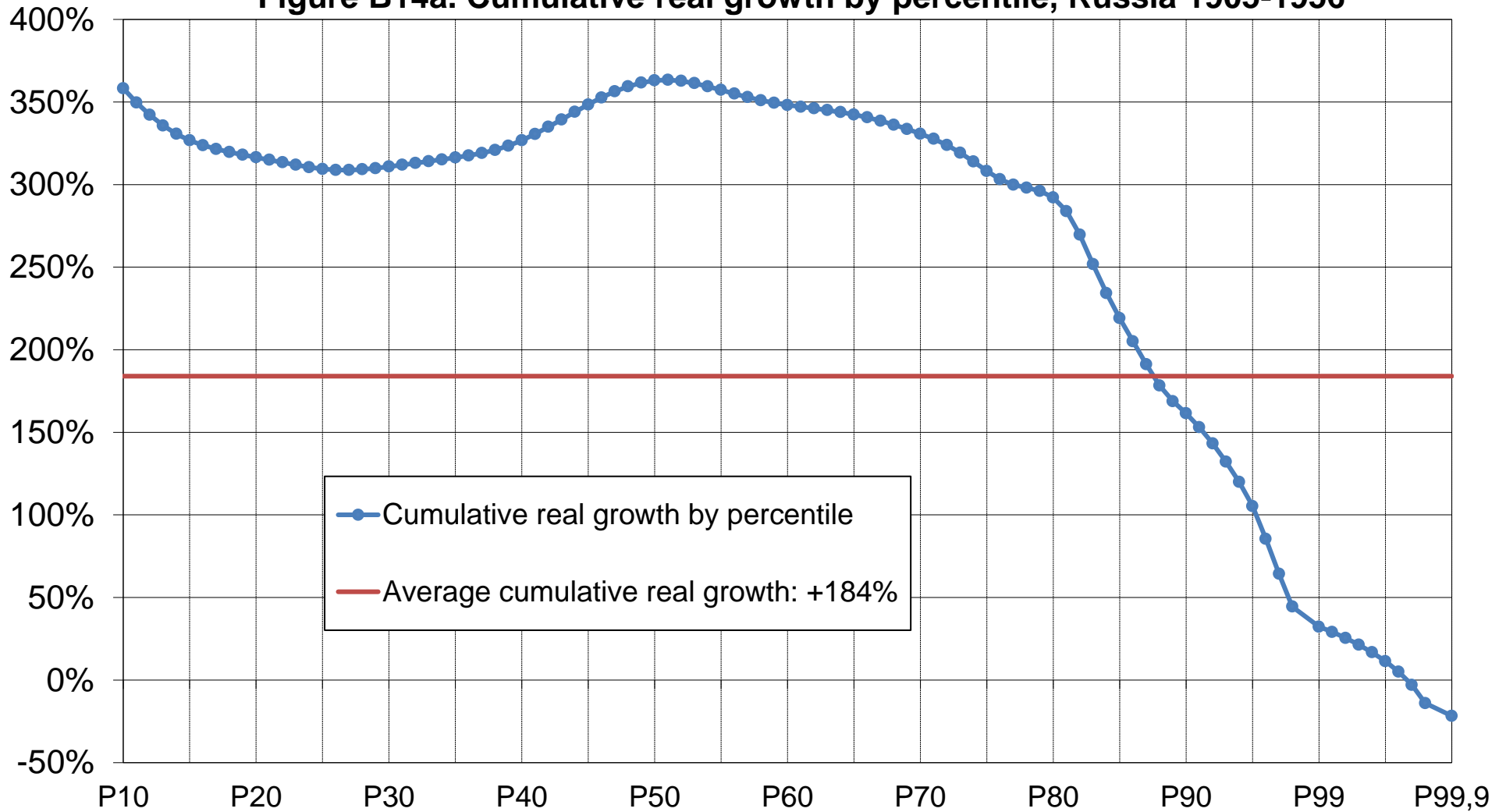
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

Figure B13b. Annual real growth rates by percentile, Russia 1905-2016



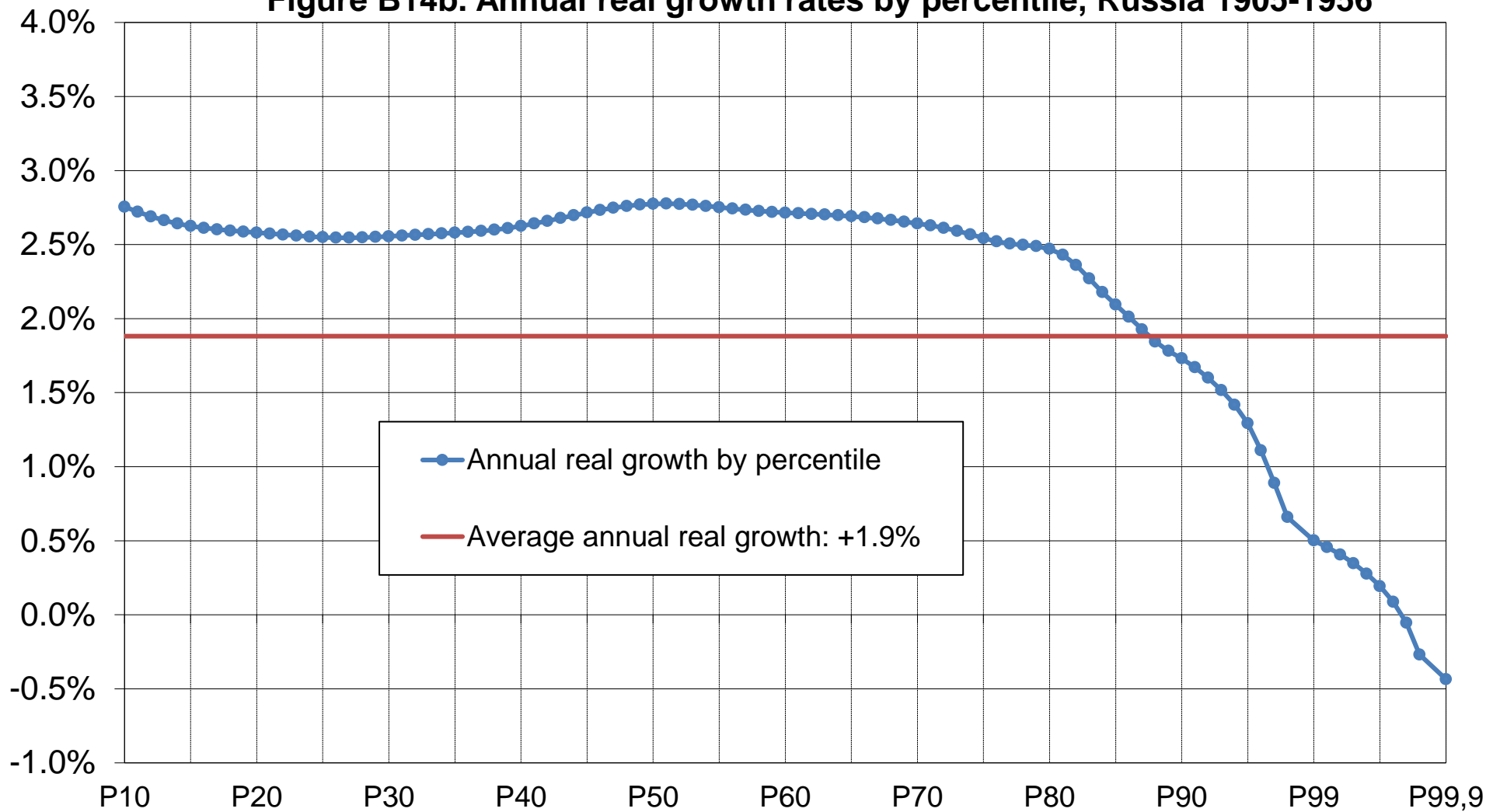
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

Figure B14a. Cumulative real growth by percentile, Russia 1905-1956



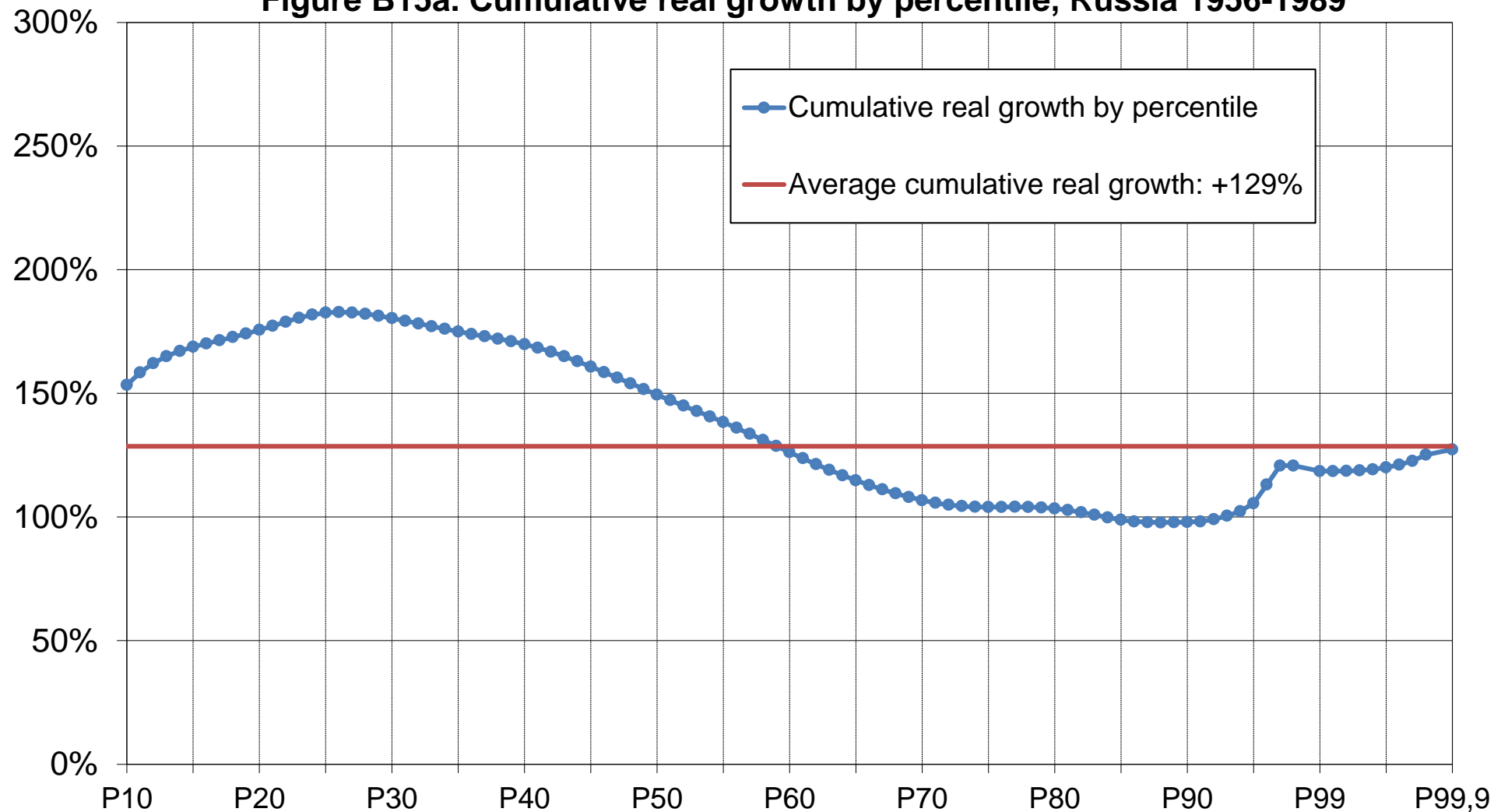
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

Figure B14b. Annual real growth rates by percentile, Russia 1905-1956



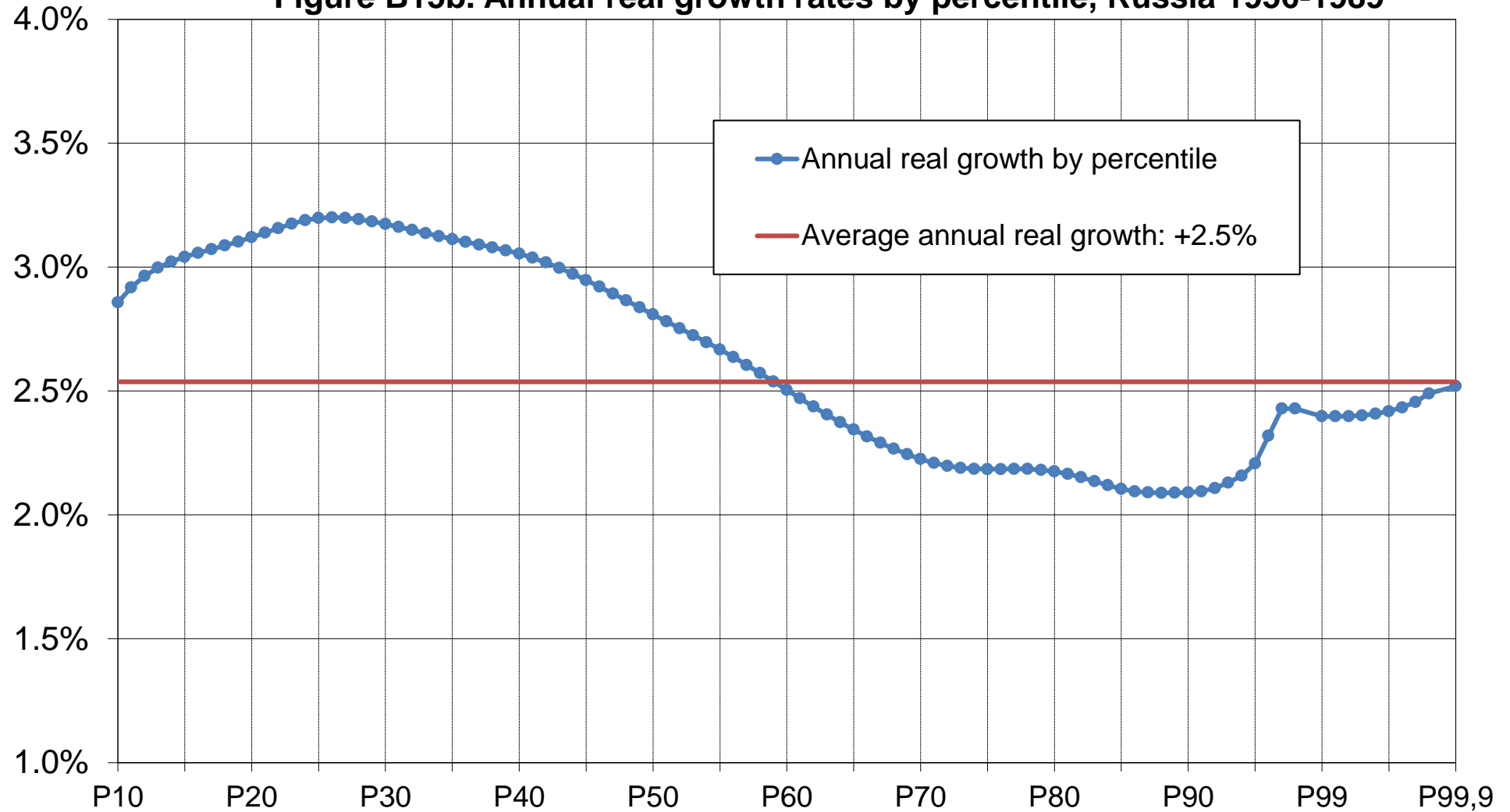
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

Figure B15a. Cumulative real growth by percentile, Russia 1956-1989



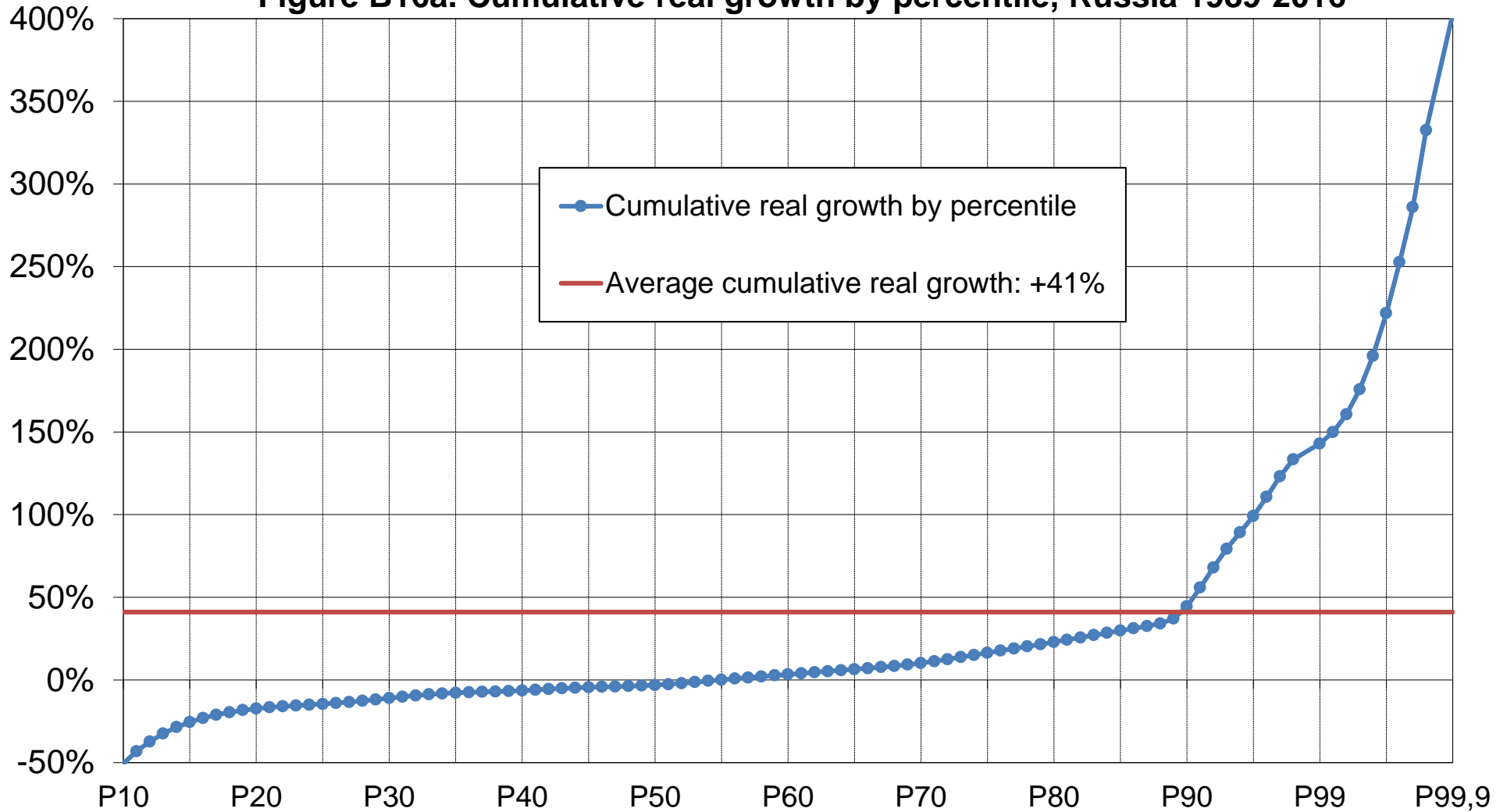
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

Figure B15b. Annual real growth rates by percentile, Russia 1956-1989



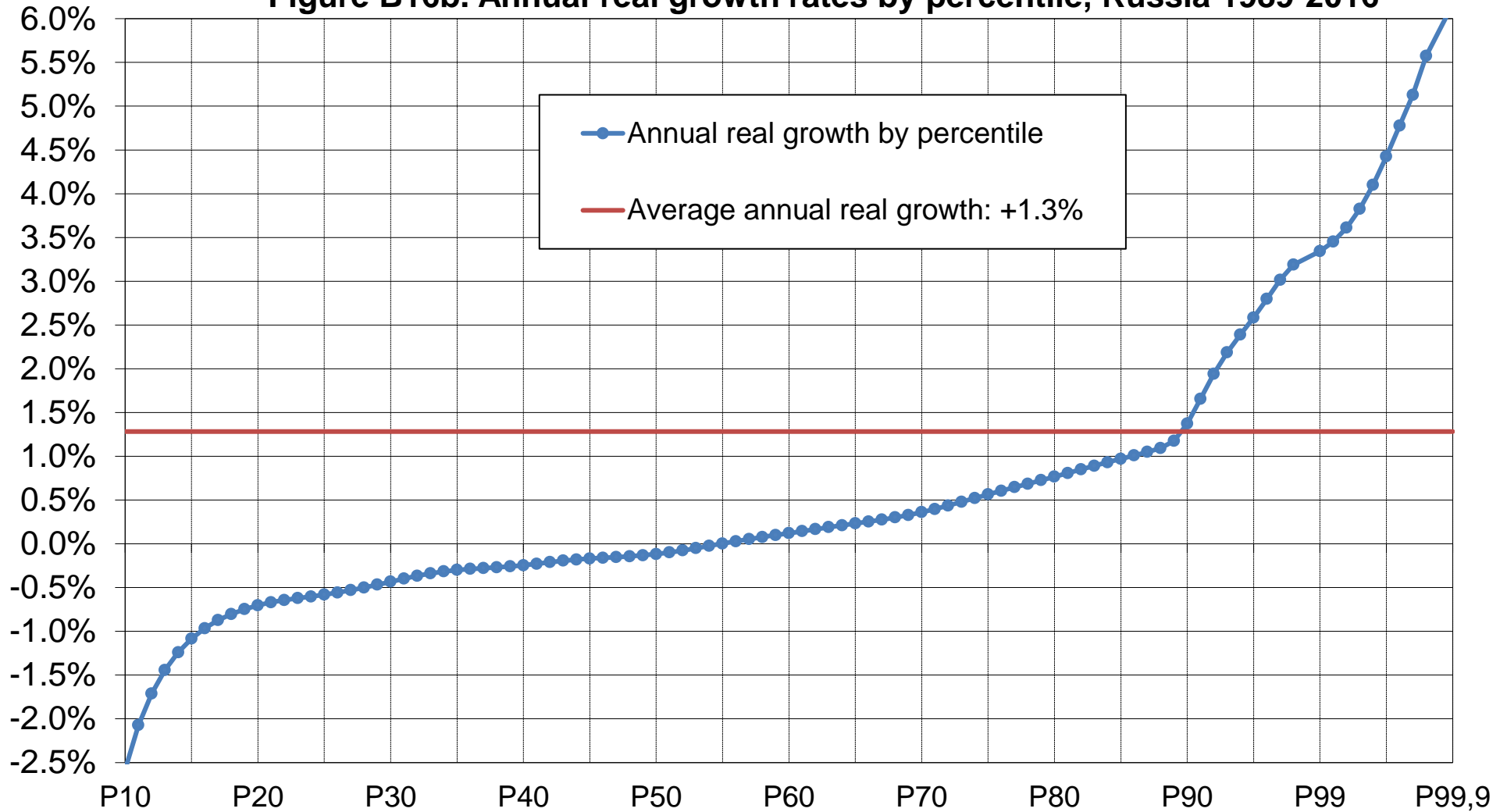
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

Figure B16a. Cumulative real growth by percentile, Russia 1989-2016



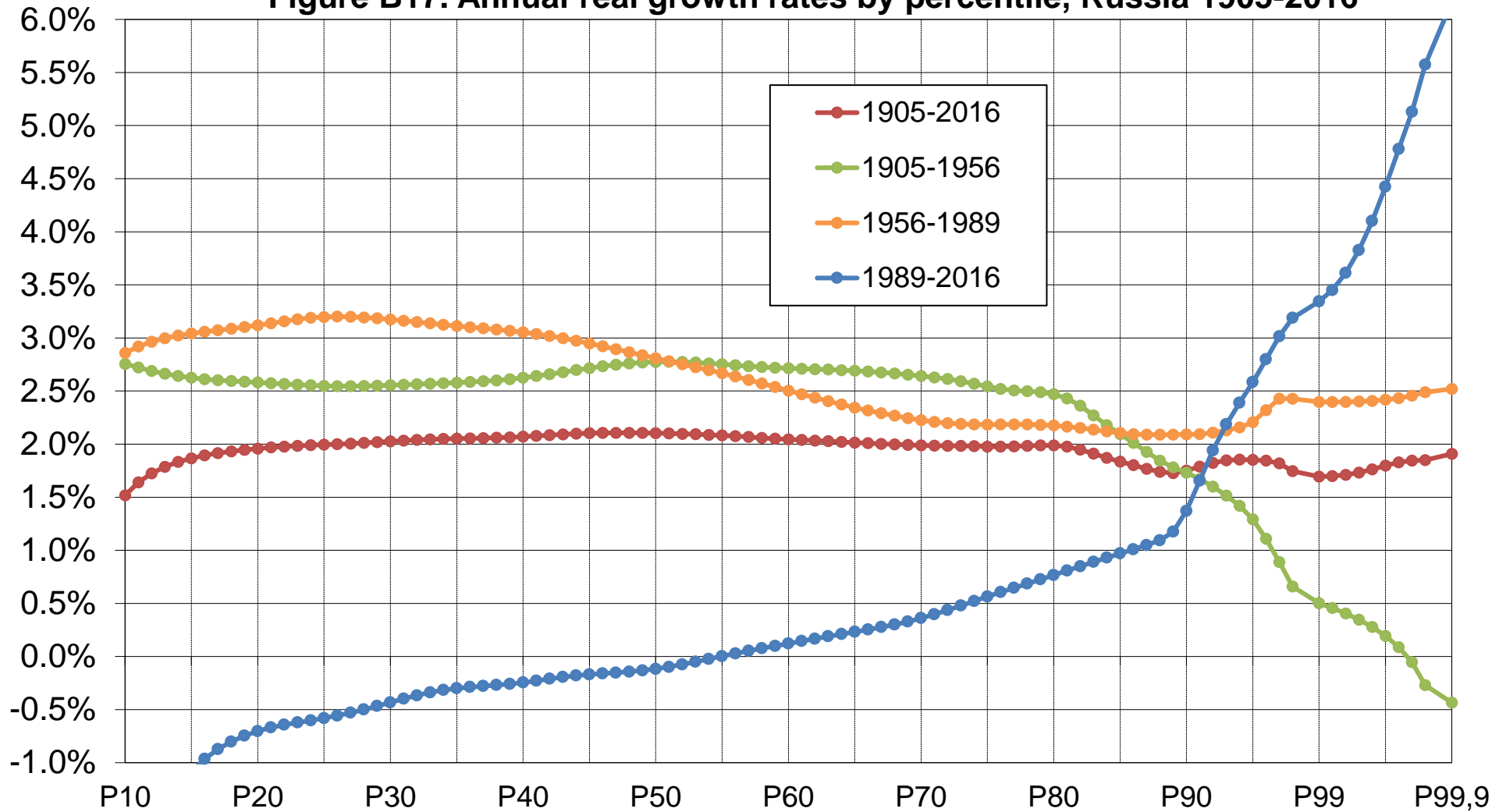
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

Figure B16b. Annual real growth rates by percentile, Russia 1989-2016



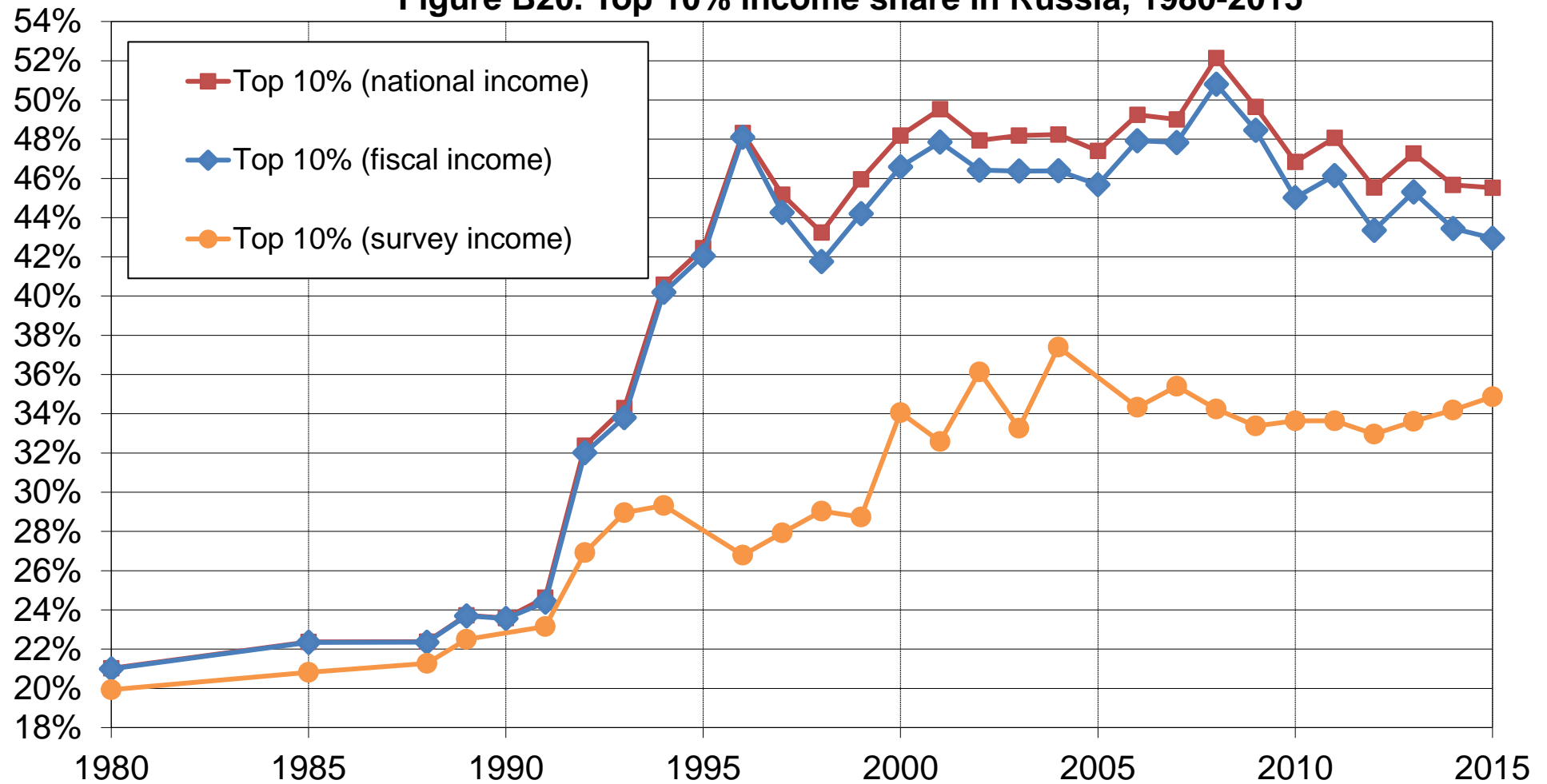
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

Figure B17. Annual real growth rates by percentile, Russia 1905-2016



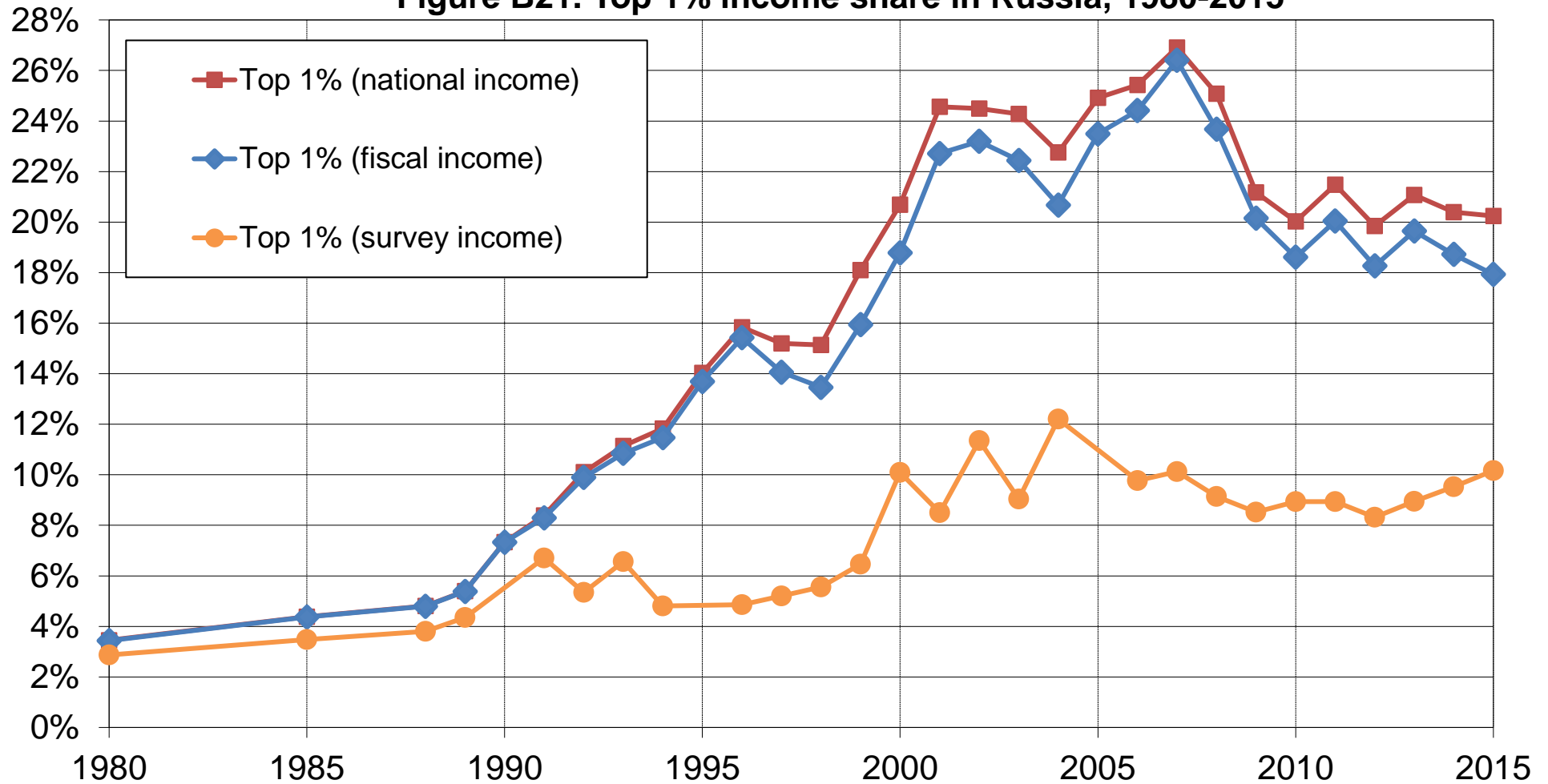
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

Figure B20. Top 10% income share in Russia, 1980-2015



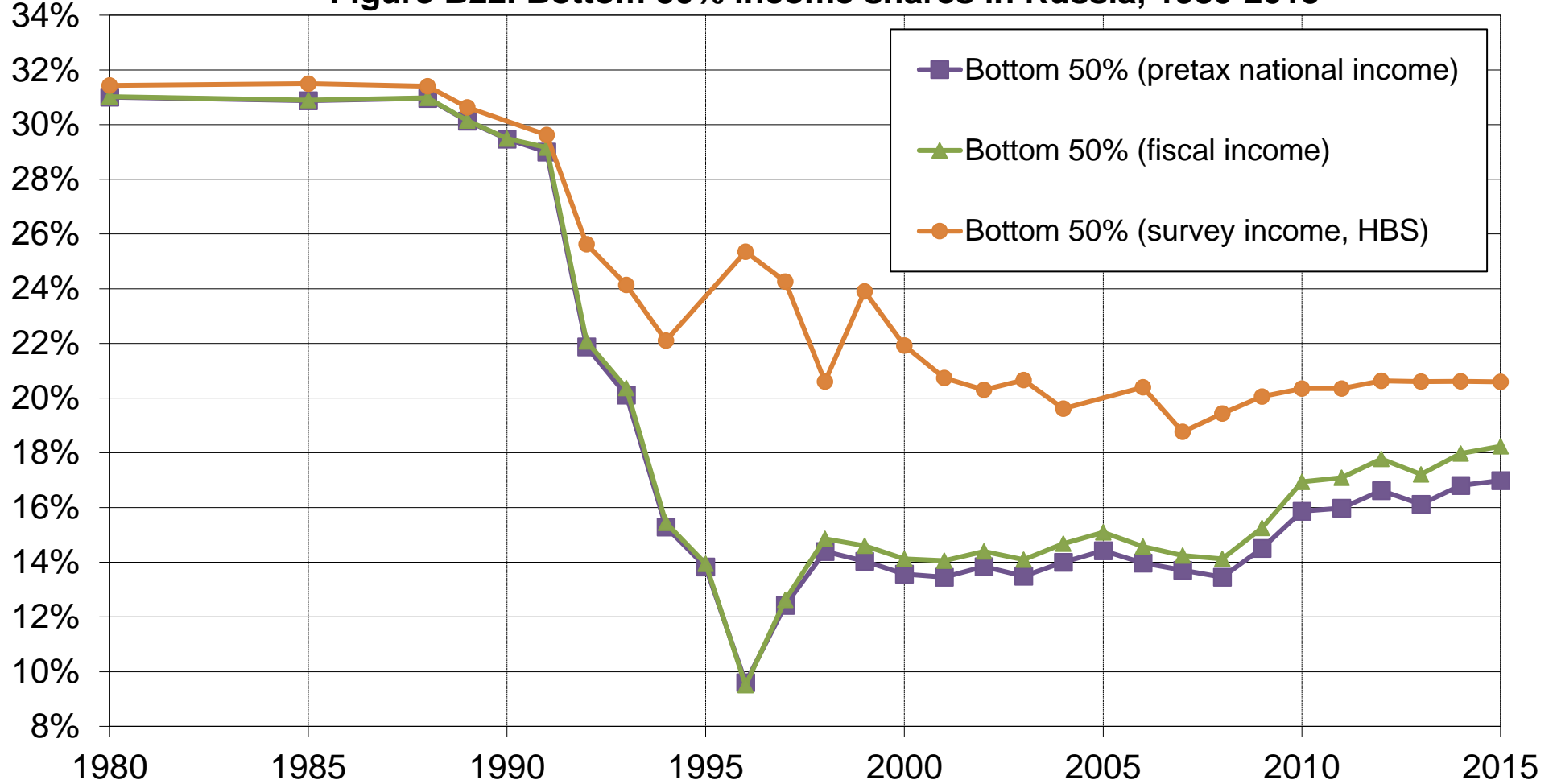
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

Figure B21. Top 1% income share in Russia, 1980-2015



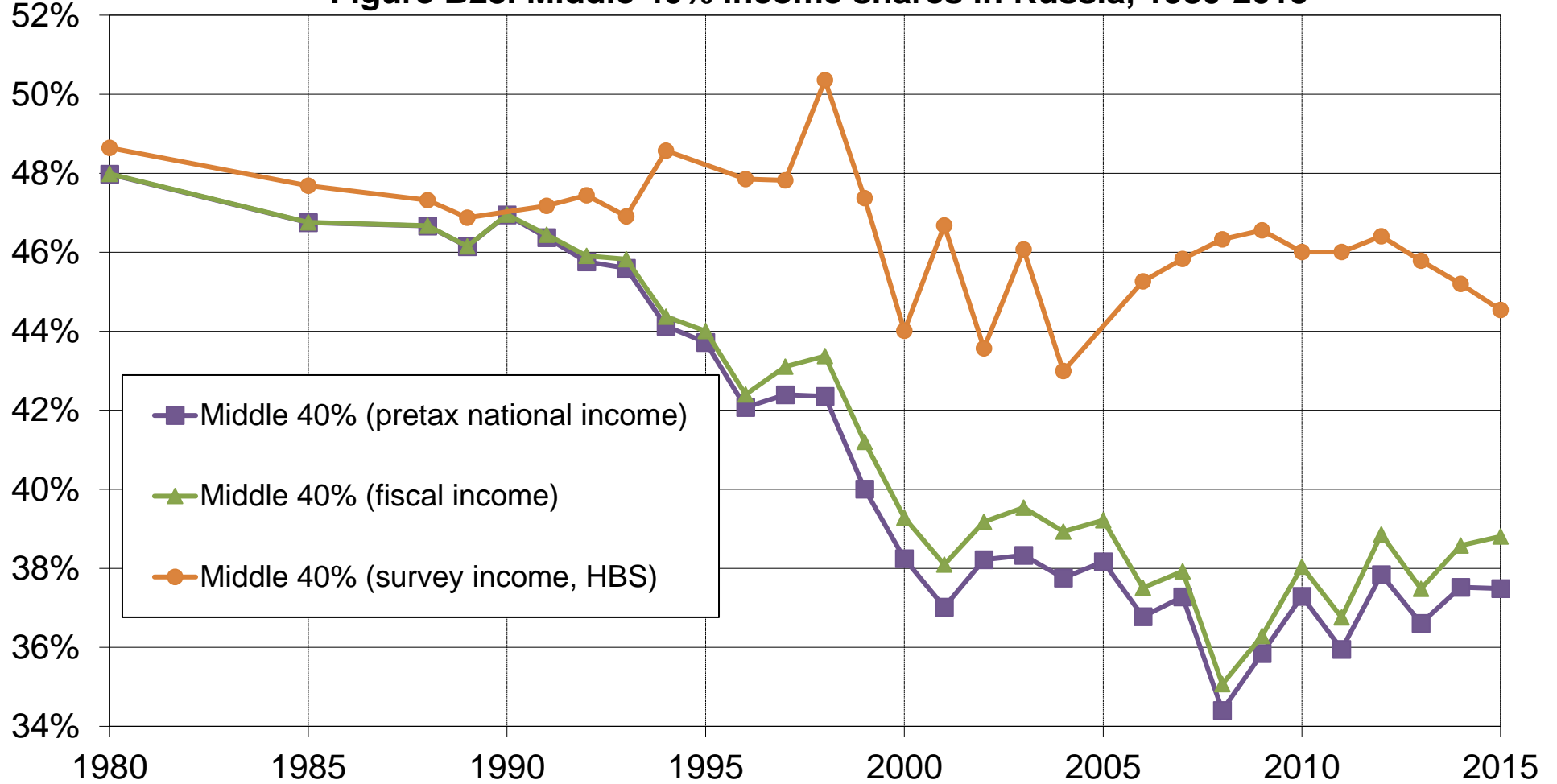
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

Figure B22. Bottom 50% income shares in Russia, 1980-2015



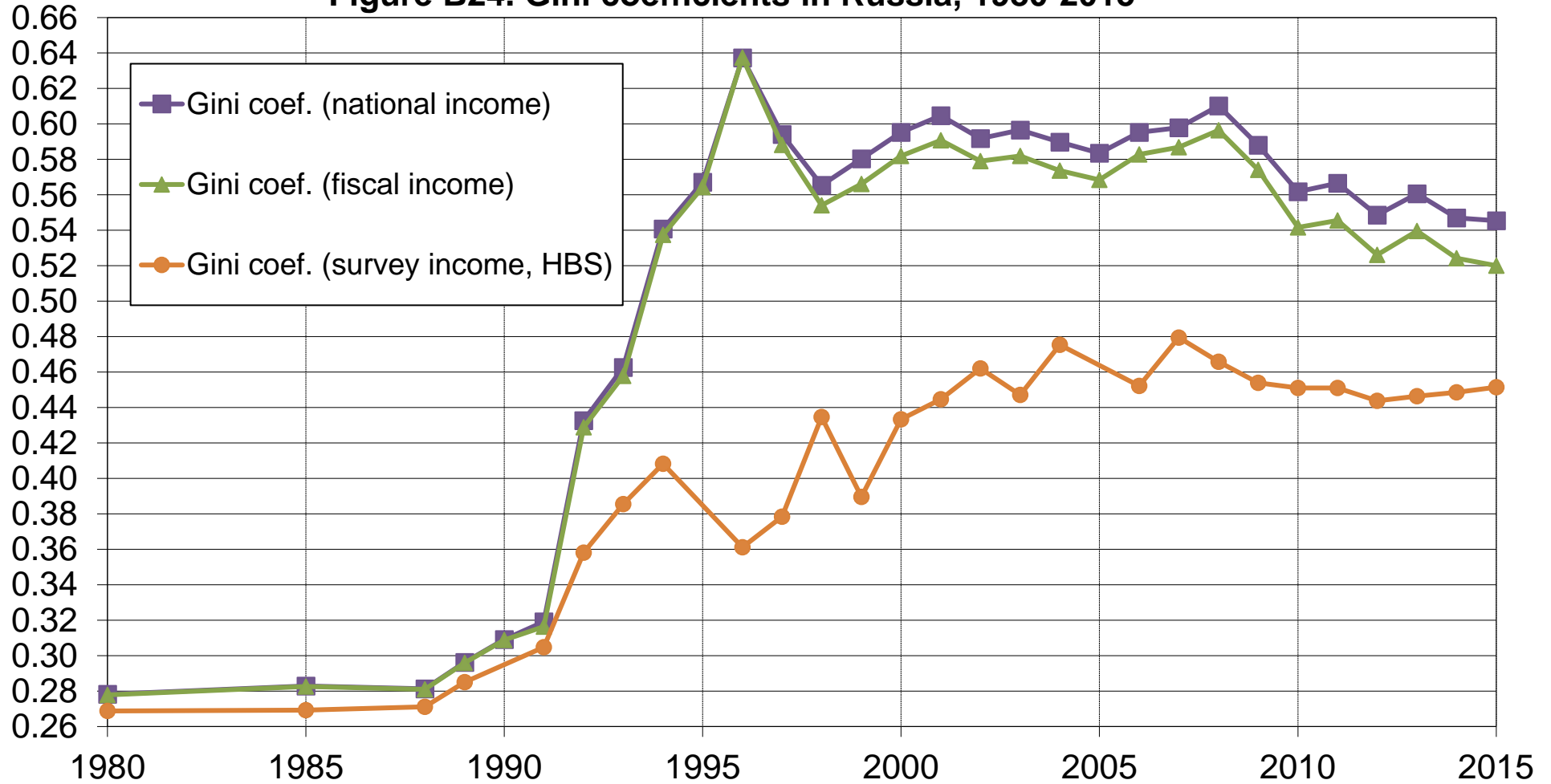
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

Figure B23. Middle 40% income shares in Russia, 1980-2015



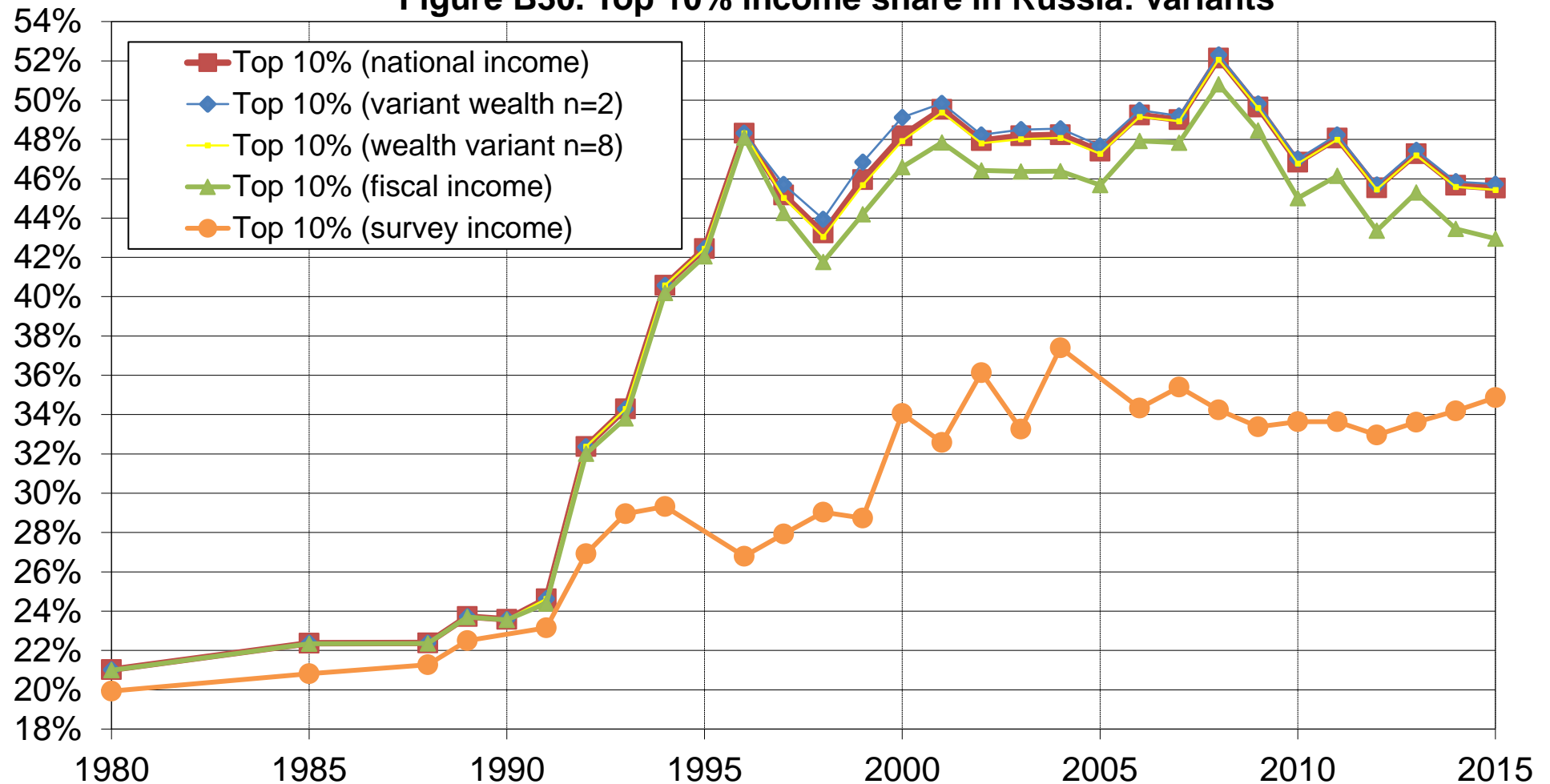
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

Figure B24. Gini coefficients in Russia, 1980-2015



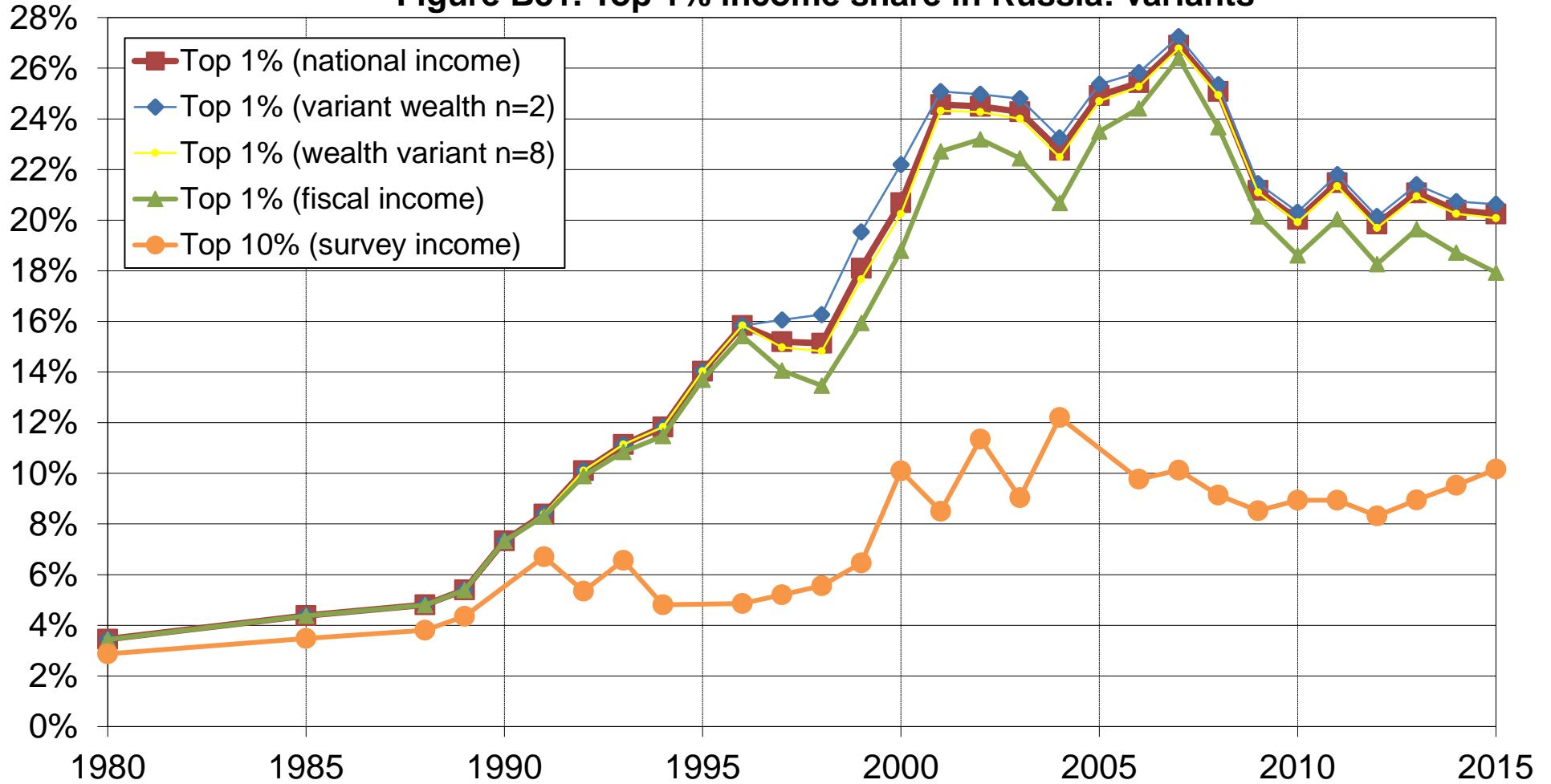
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

Figure B30. Top 10% income share in Russia: variants



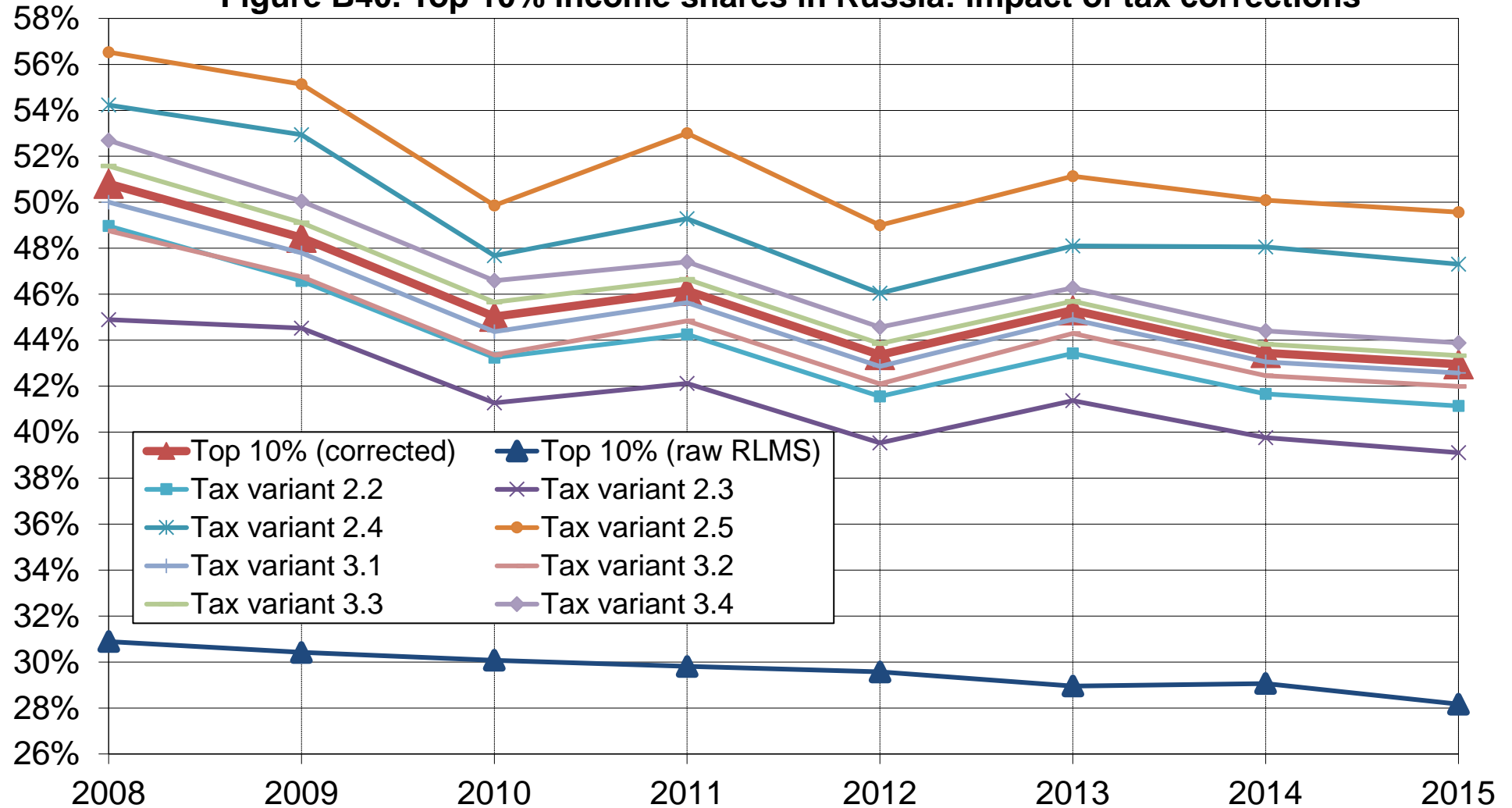
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

Figure B31. Top 1% income share in Russia: variants



Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

Figure B40. Top 10% income shares in Russia: impact of tax corrections

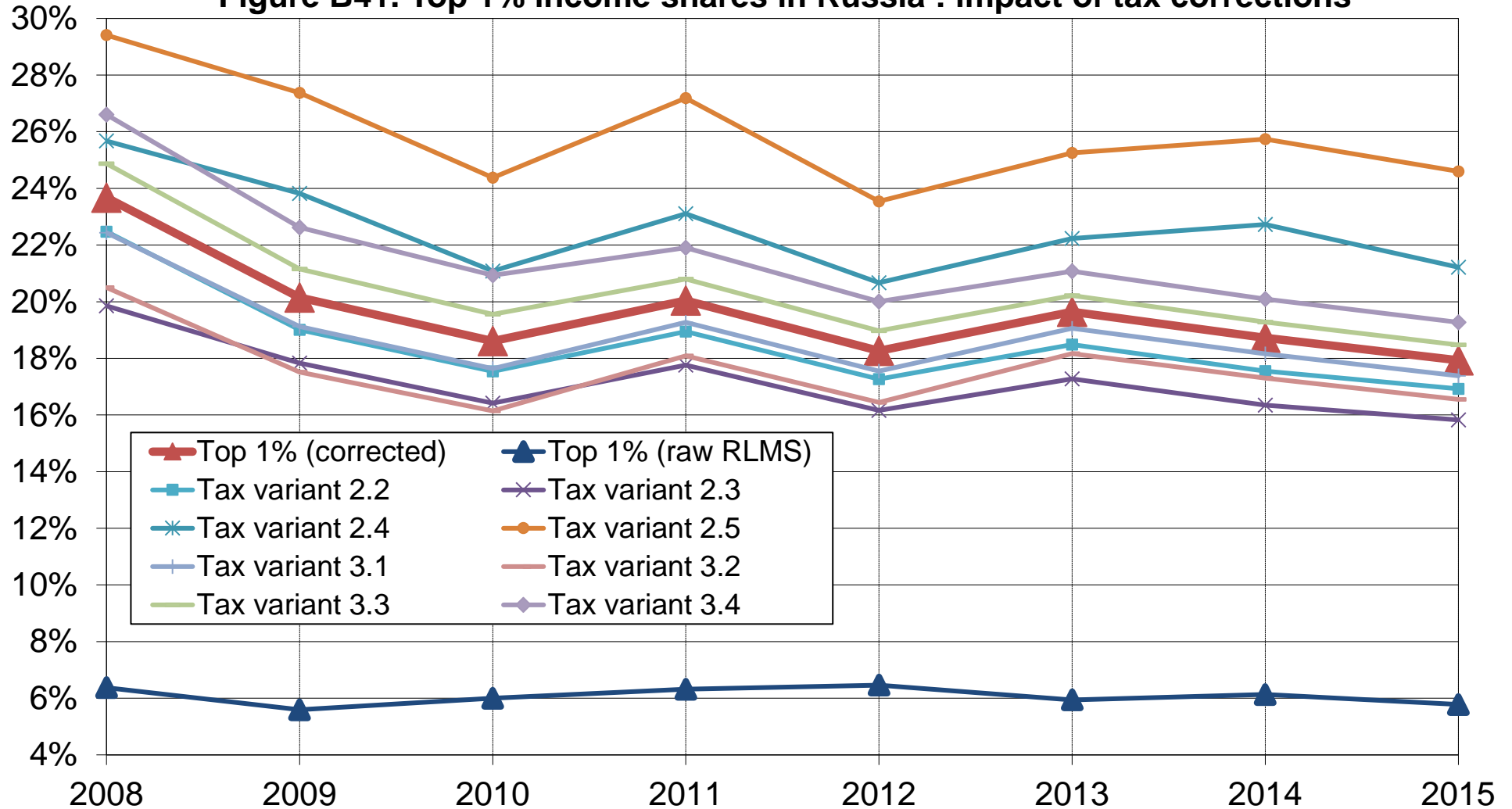


Distribution of fiscal income (before taxes and transfers, except pensions and unempl. insurance) among adults.

Fiscal income estimates combine RLMS survey data and income tax data. Raw estimates rely only on self-reported RLMS survey data.

Equal-split-adults series (income of married couples divided by two).

Figure B41. Top 1% income shares in Russia : impact of tax corrections

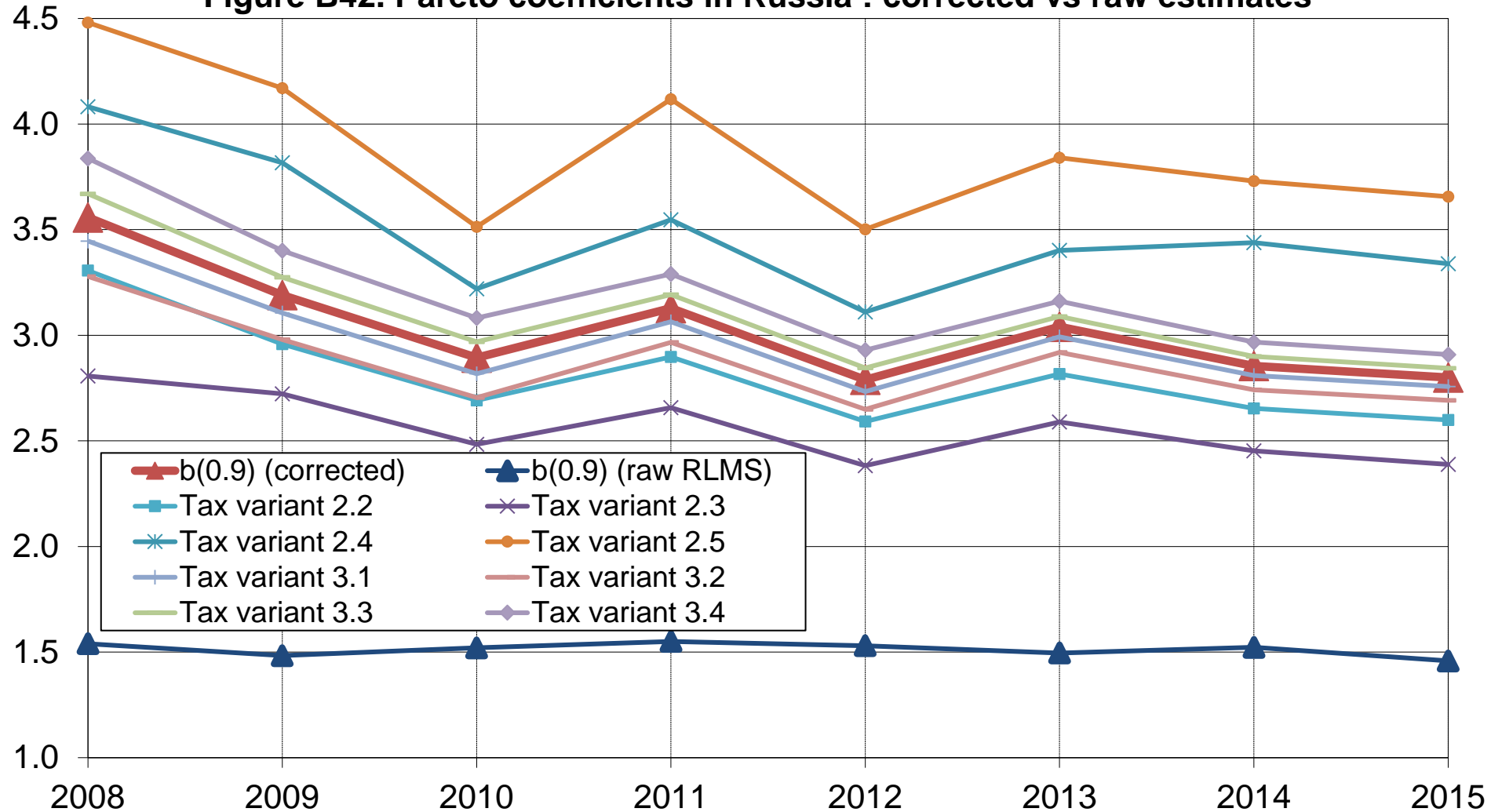


Distribution of fiscal income (before taxes and transfers, except pensions and unempl. insurance) among adults.

Fiscal income estimates combine RLMS survey data and income tax data. Raw estimates rely only on self-reported RLMS survey data.

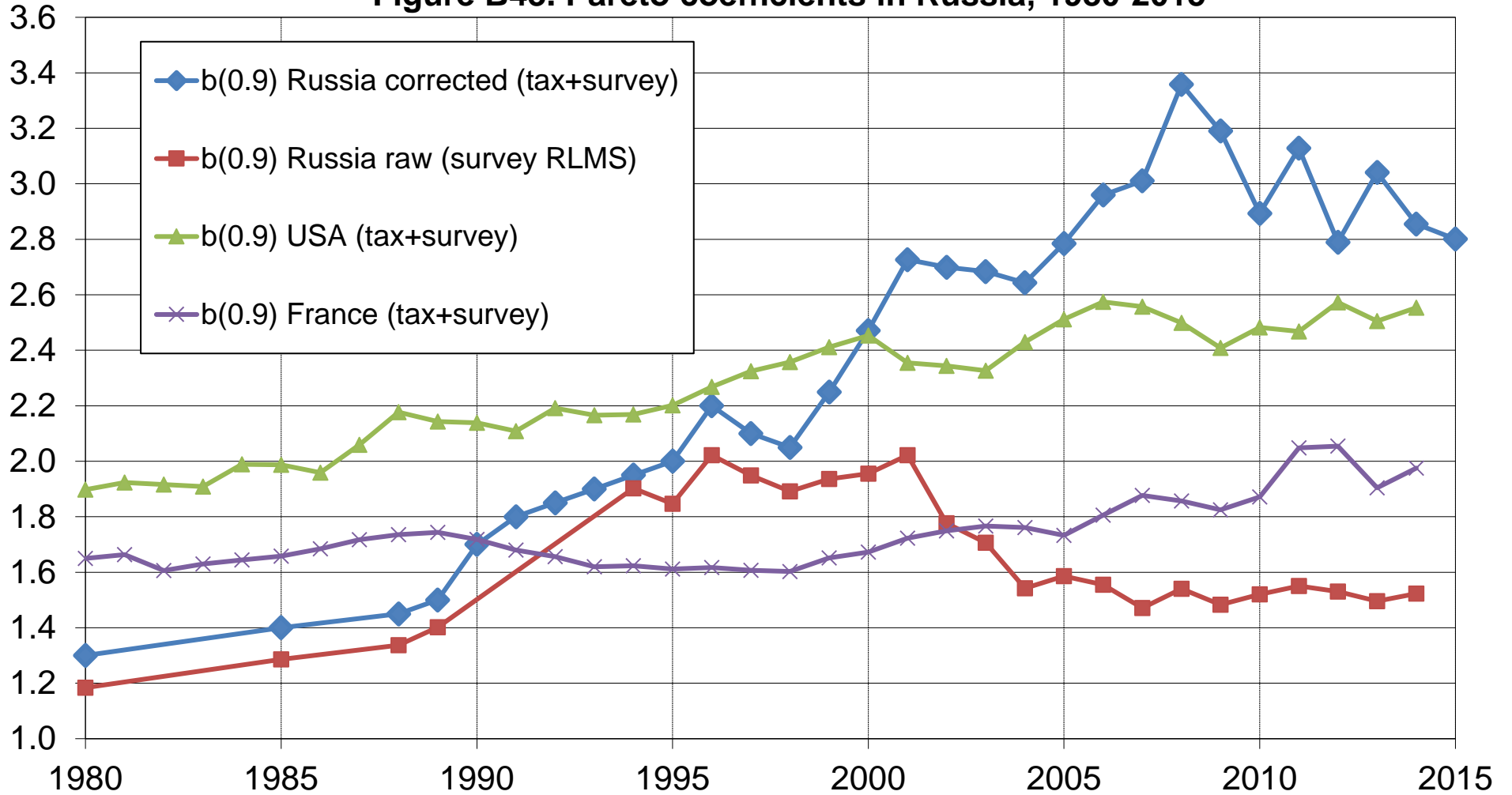
Equal-split-adults series (income of married couples divided by two).

Figure B42. Pareto coefficients in Russia : corrected vs raw estimates



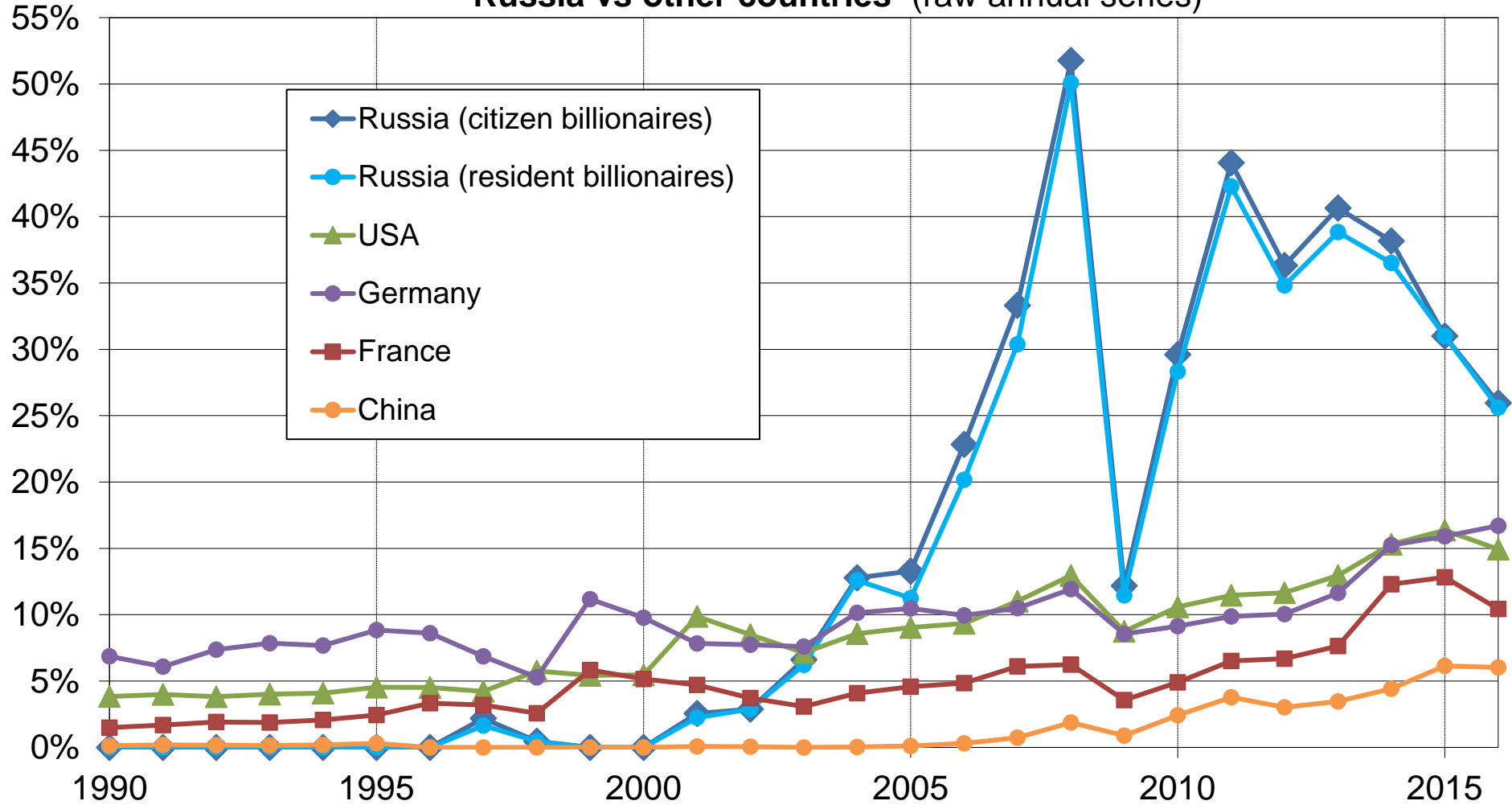
Distribution of fiscal income (before taxes and transfers, except pensions and unempl. insurance) among adults.
 Fiscal income estimates combine RLMS survey data and income tax data. Raw estimates rely only on self-reported RLMS survey data.
 Equal-split-adults series (income of married couples divided by two).

Figure B43. Pareto coefficients in Russia, 1980-2015



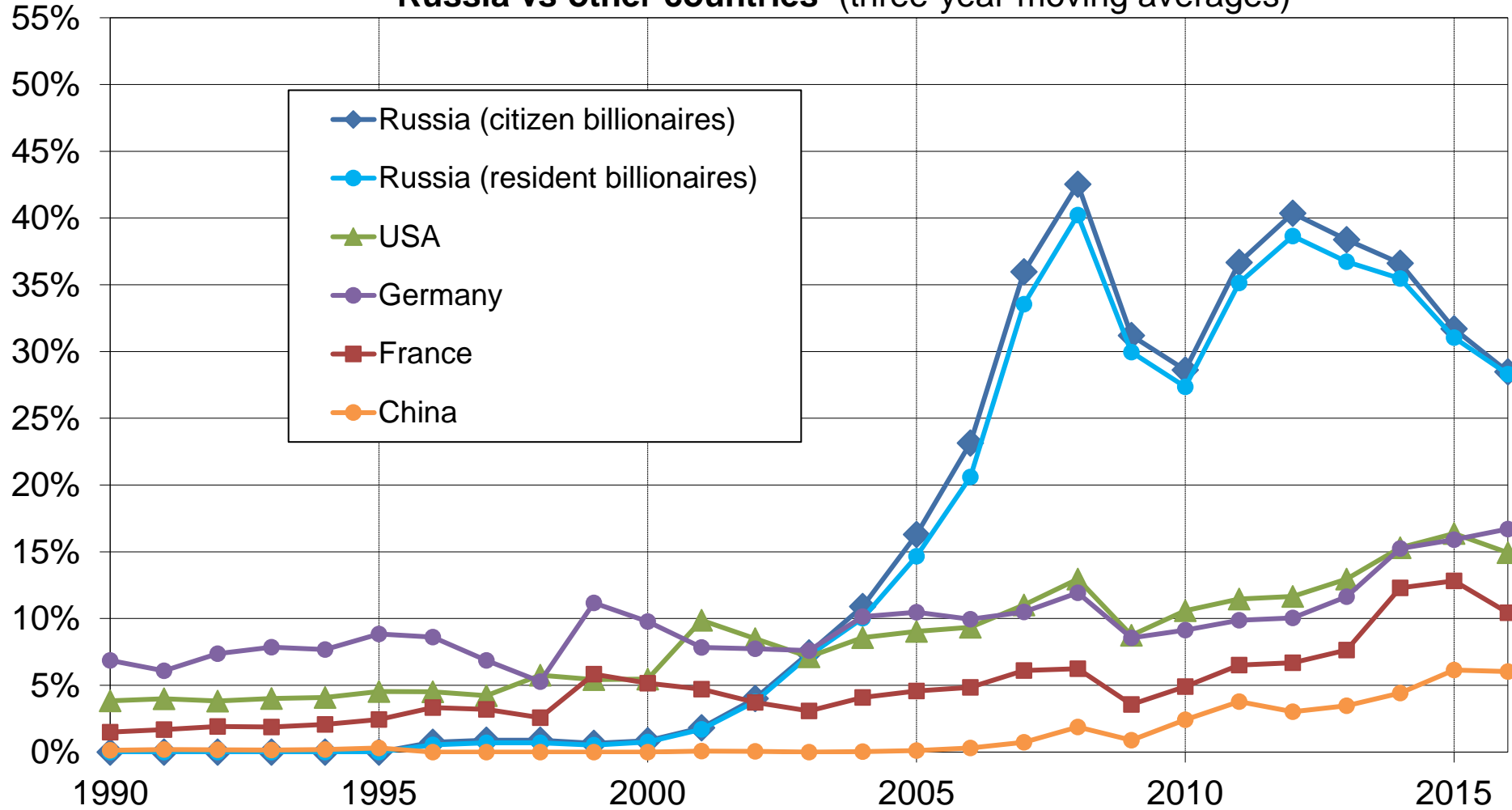
Distribution of fiscal income (before taxes and transfers, except pensions and unempl. insurance) among adults.
 Fiscal income estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data.
 Equal-split-adults series (income of married couples divided by two).

**Figure B50a. Total Forbes billionaire wealth (% national income):
Russia vs other countries (raw annual series)**



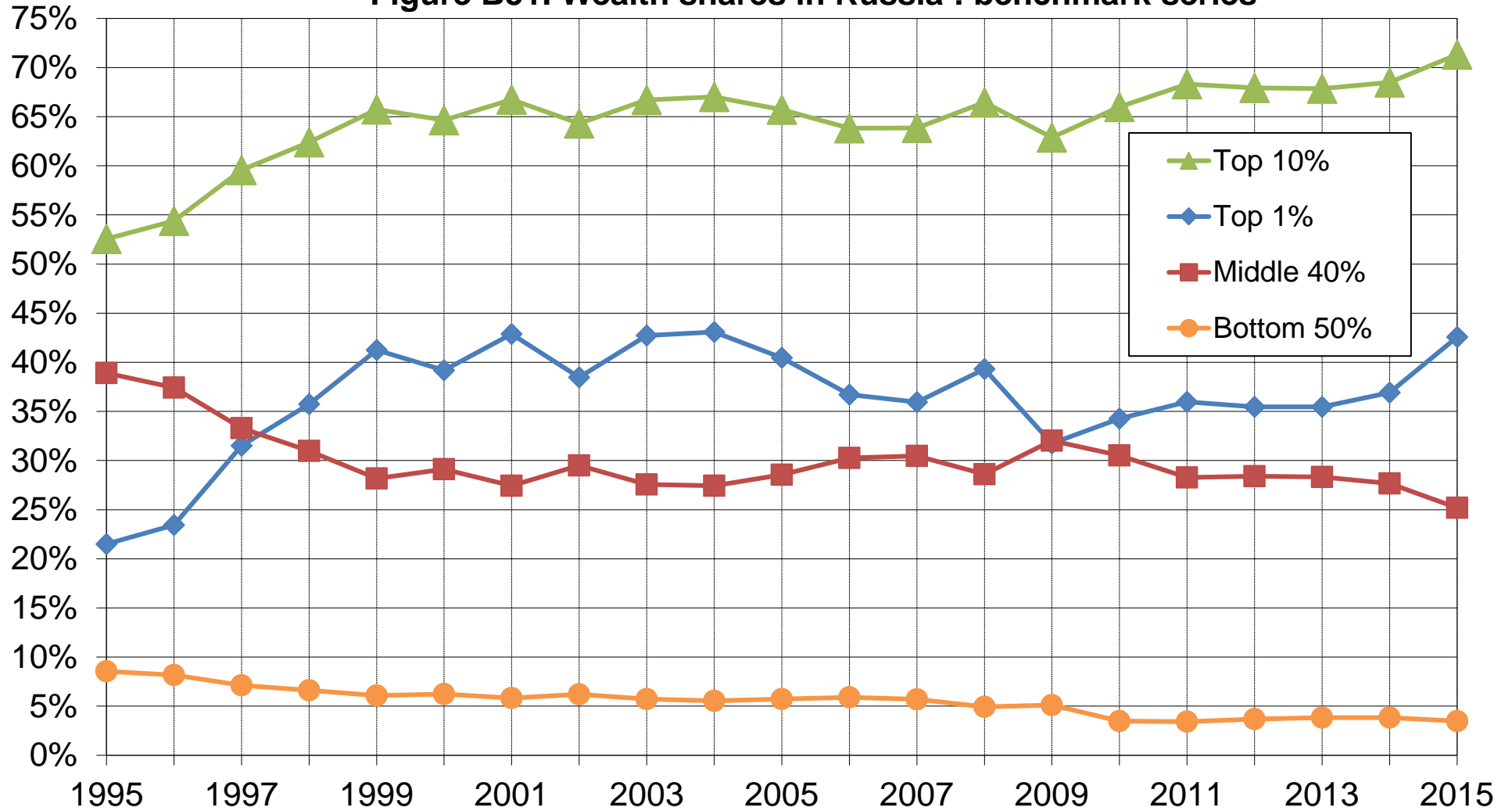
Total billionaire wealth (as recorded by Forbes global list of dollar billionaires) divided by national income (measured at market exchange rates). For other countries only citizen billionaires are reported here (numbers for resident billionaires are virtually identical).

**Figure B50b. Total Forbes billionaire wealth (% national income):
Russia vs other countries (three-year moving averages)**



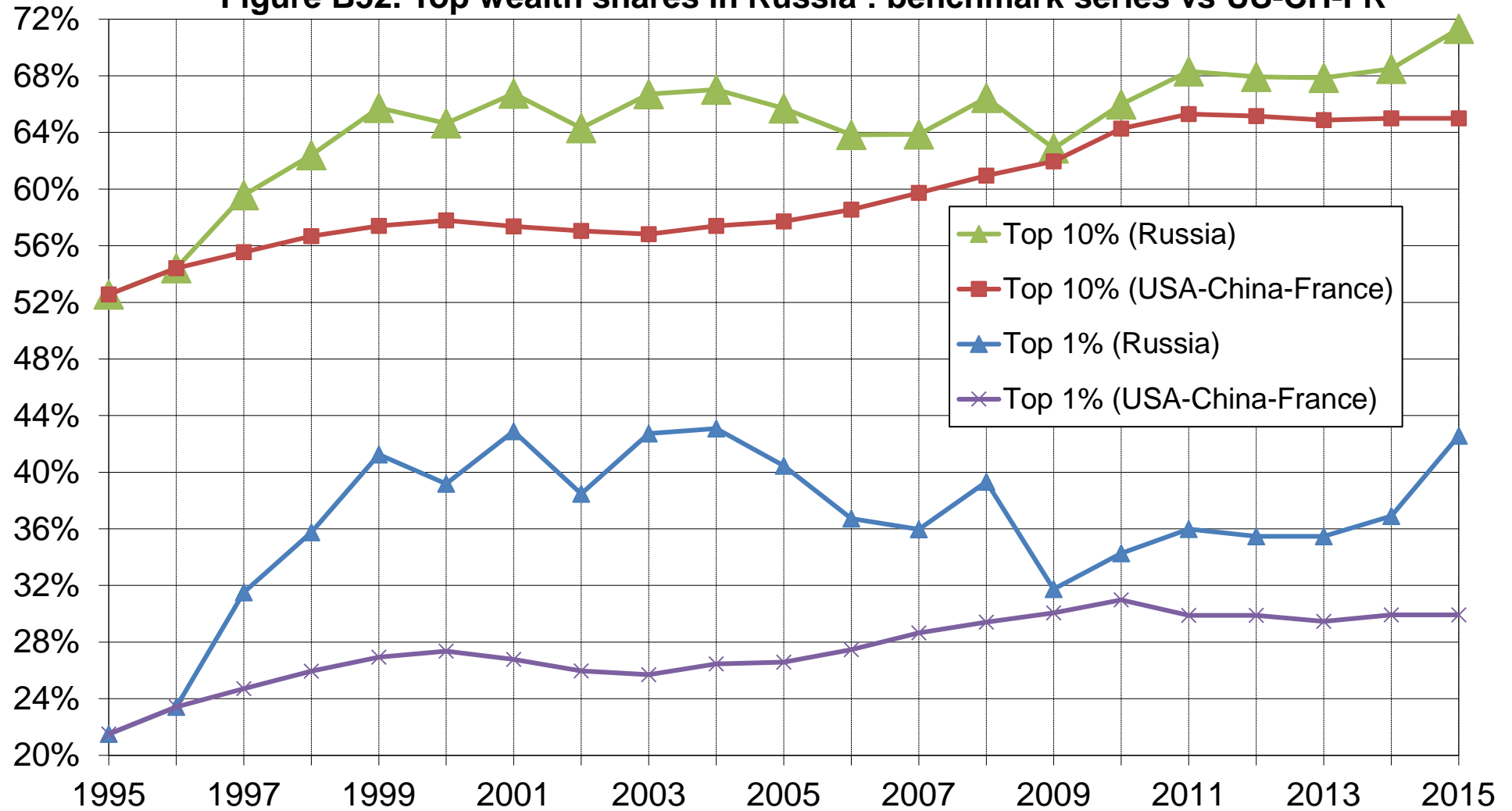
Total billionaire wealth (as recorded by Forbes global list of dollar billionaires) divided by national income (measured at market exchange rates). For other countries, we only report citizen billionaires (numbers for resident billionaires are virtually identical).

Figure B51. Wealth shares in Russia : benchmark series



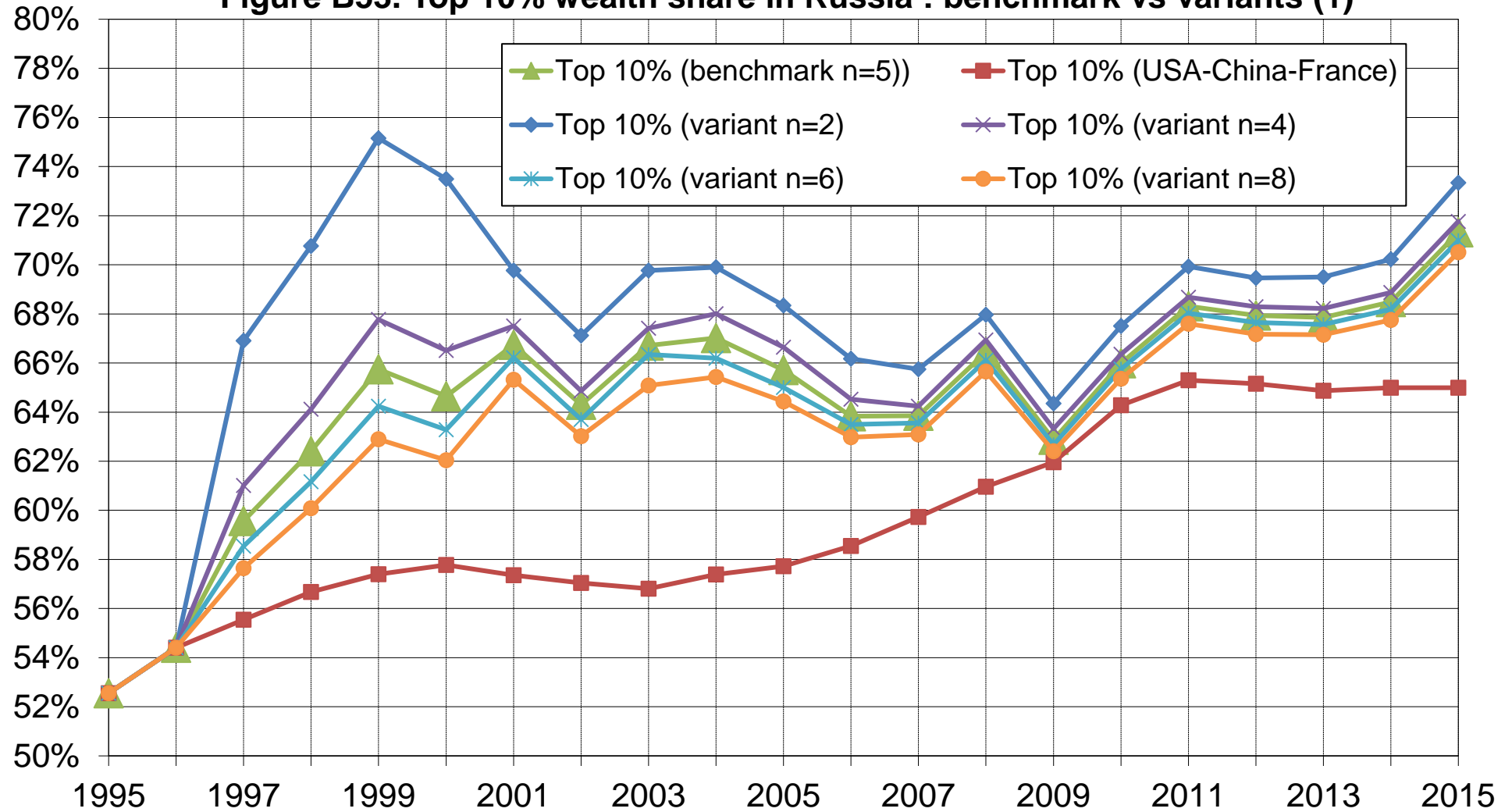
Distribution of personal wealth among adults. Estimates obtained by combining Forbes billionaire data for Russia, generalized Pareto interpolation techniques and average normalized wealth distribution for USA-China-France. Benchmark series.

Figure B52. Top wealth shares in Russia : benchmark series vs US-CH-FR



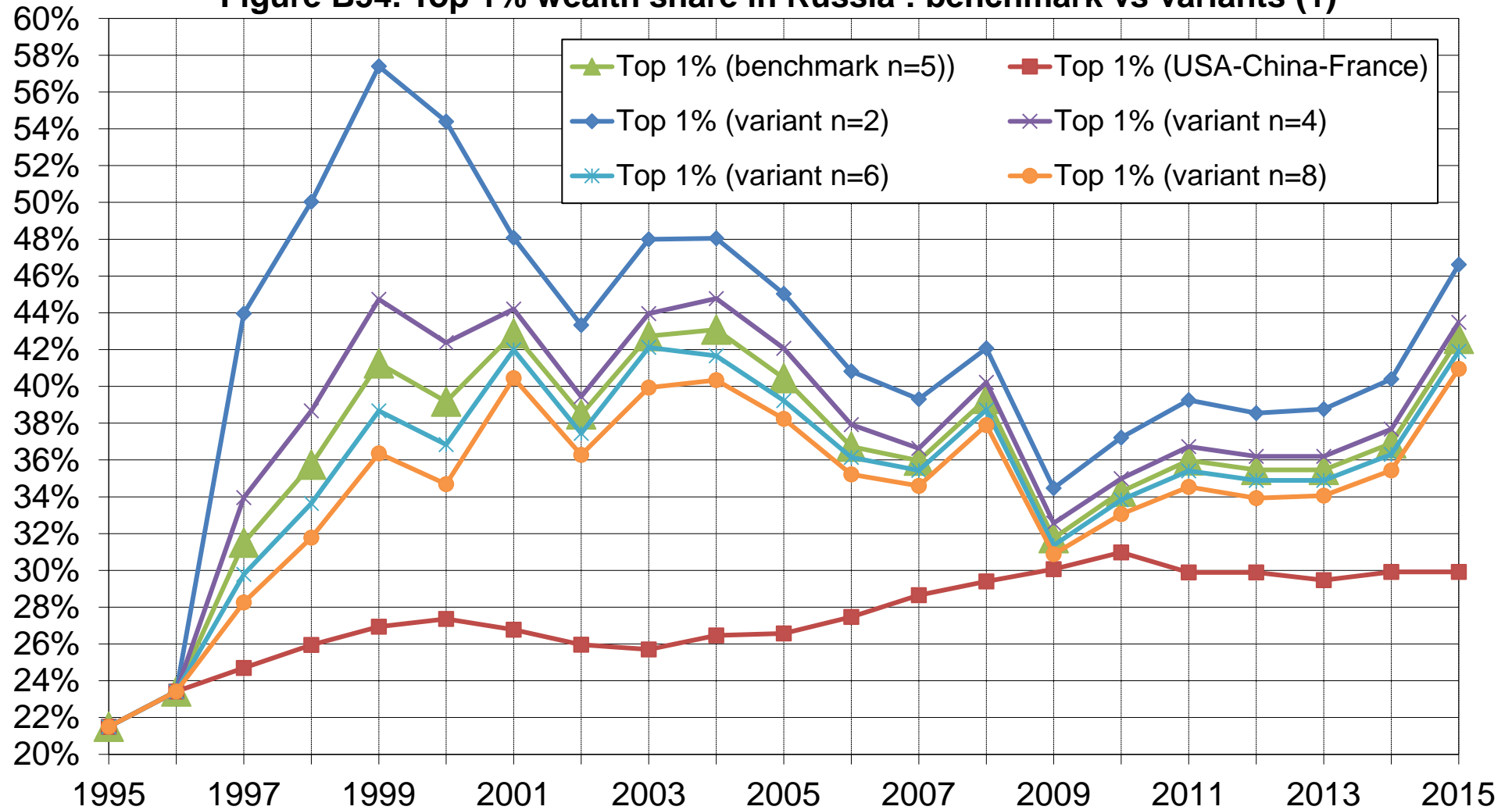
Distribution of personal wealth among adults. Estimates obtained by combining Forbes billionaire data for Russia, generalized Pareto interpolation techniques and average normalized wealth distribution for USA-China-France. Benchmark series.

Figure B53. Top 10% wealth share in Russia : benchmark vs variants (1)



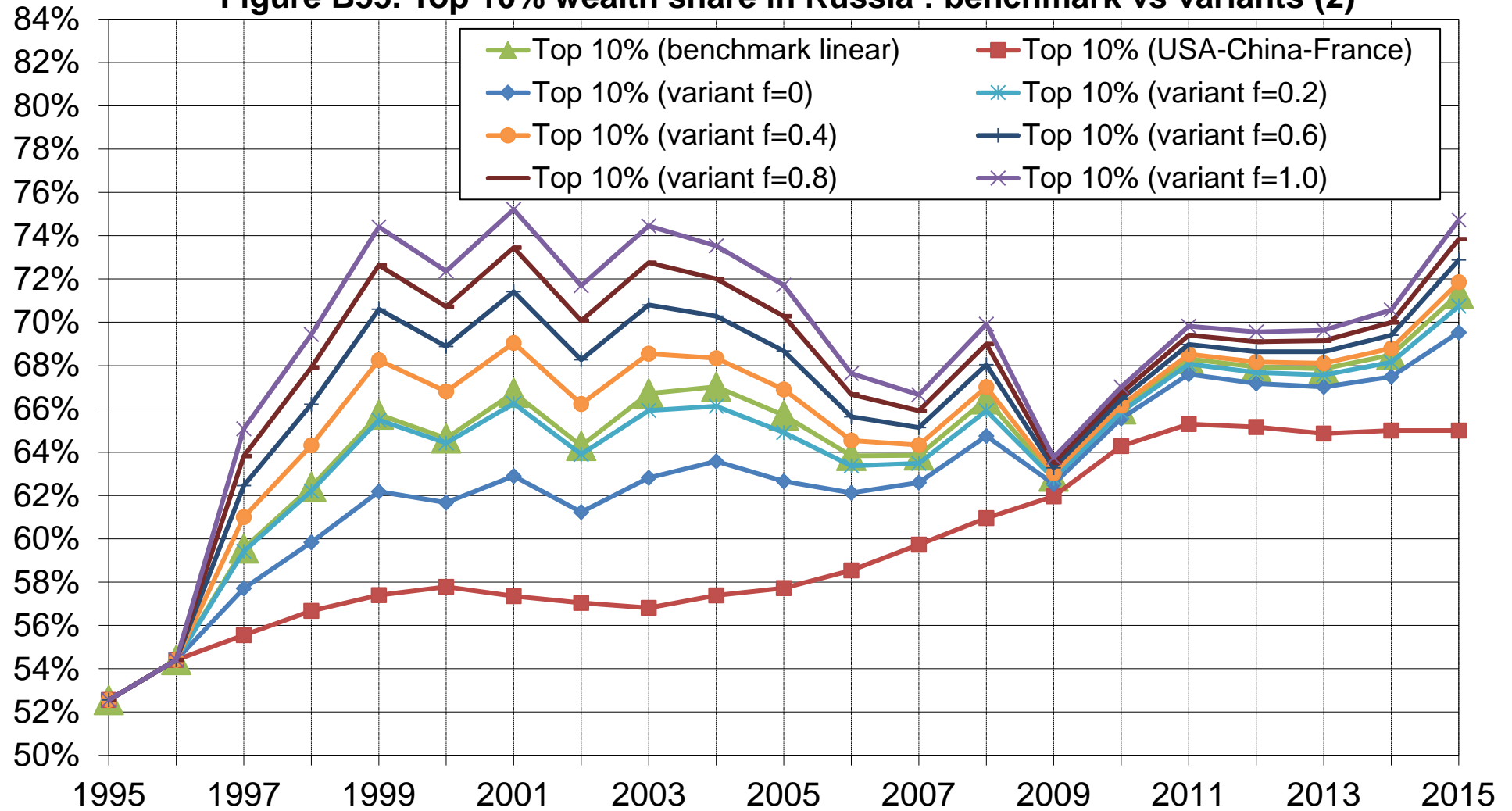
Variants based upon vaying numbers of adults per billionaire family: n=2,4,5,6,8. Corrections factors corr(p) linear between $\rho=0.99$ and billionaire wealth. Estimates 1997-2000 are highly volatile due to small number of billionaires.

Figure B54. Top 1% wealth share in Russia : benchmark vs variants (1)



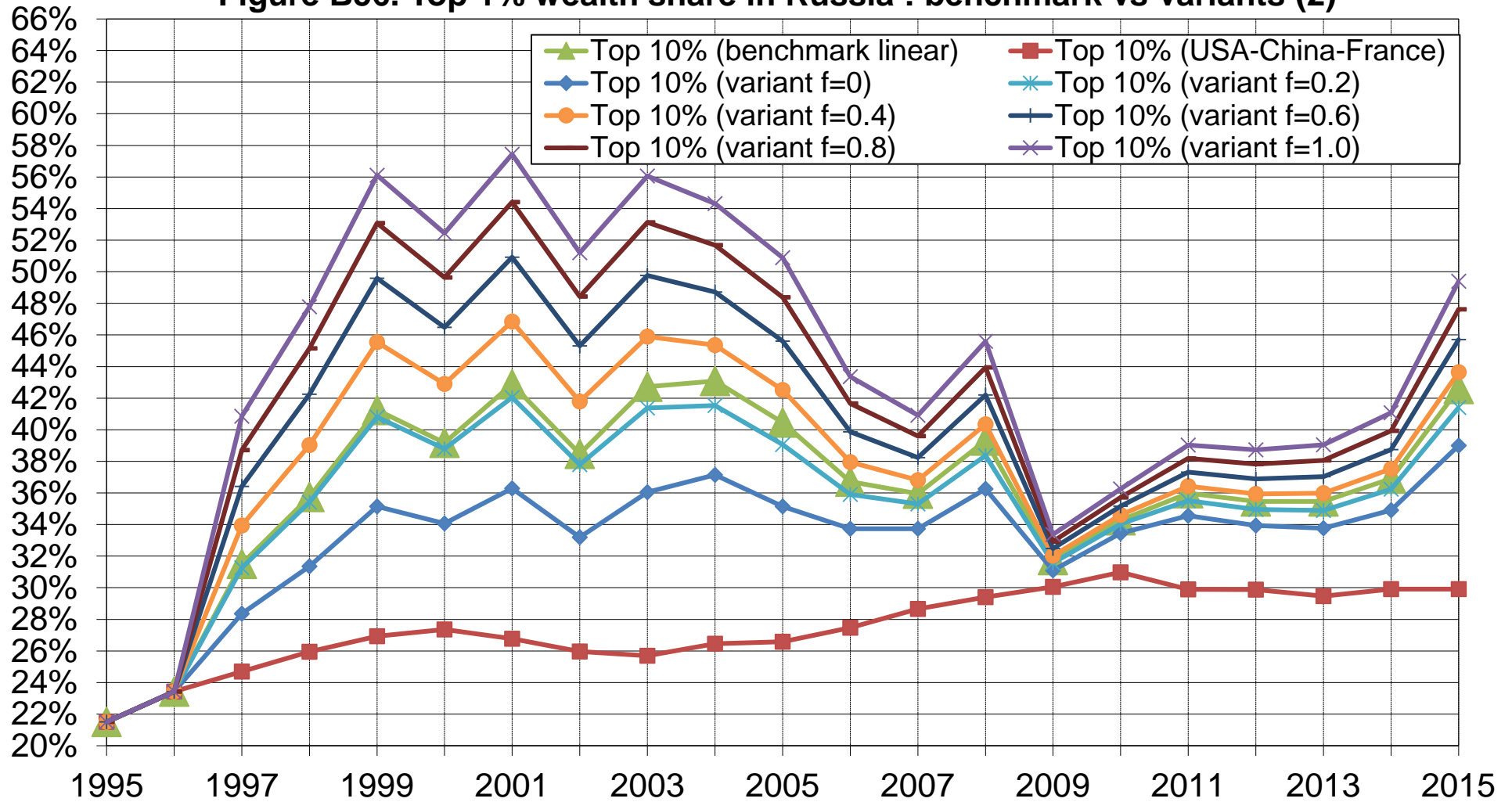
Variants based upon vaying numbers of adults per billionaire family: n=2,4,5,6,8. Corrections factors corr(p) linear between $\rho=0.99$ and billionaire wealth. Estimates 1997-2000 are highly volatile due to small number of billionaires.

Figure B55. Top 10% wealth share in Russia : benchmark vs variants (2)



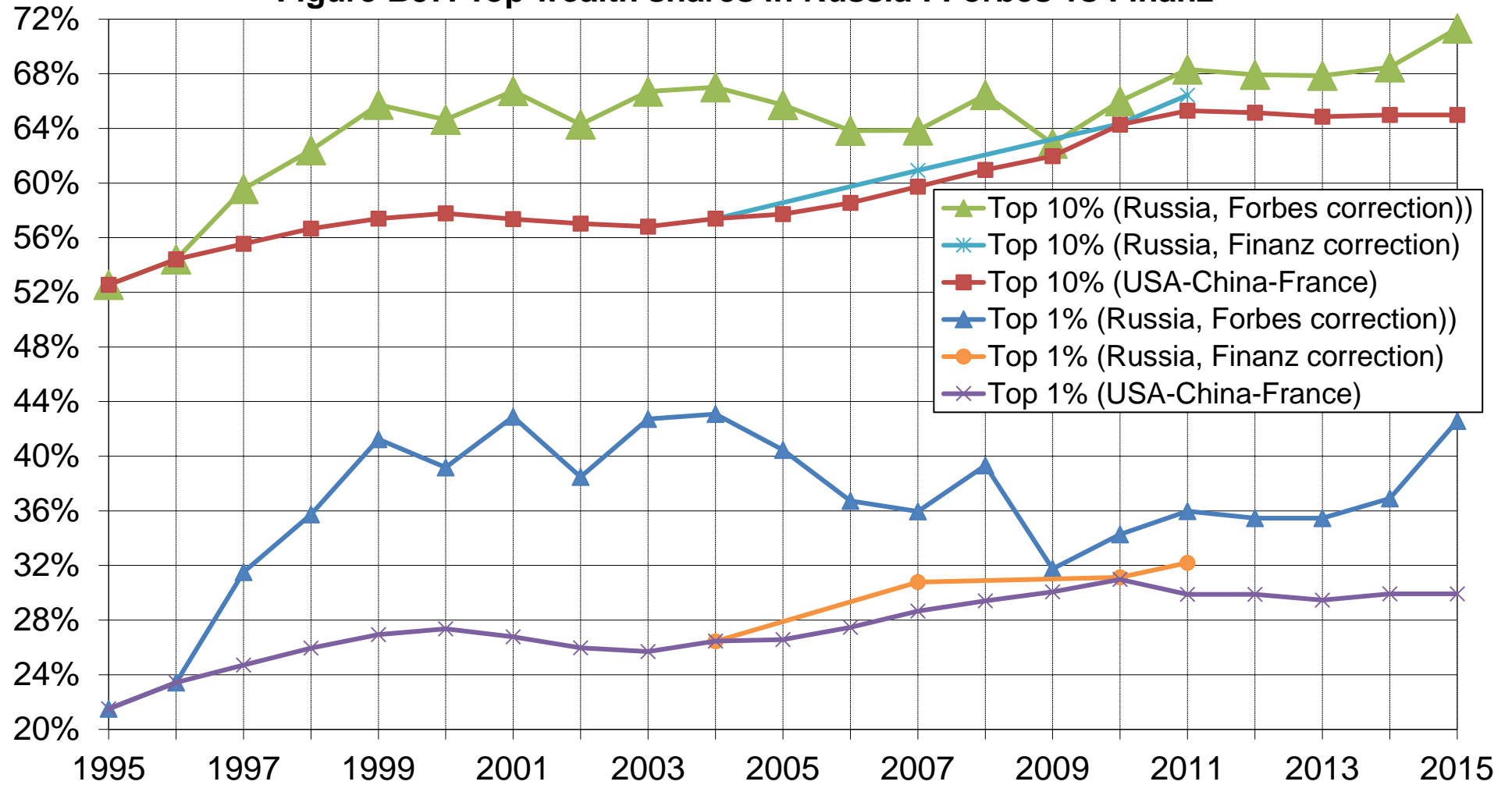
Variants based upon varying slopes of correction factors $\text{corr}(p)$: linear between $p=0.99$ and billionaire level (benchmark) or piecewise linear with fraction f of total correction between $p=0.99$ and $p=0.999$. Number of adults per billionaire family $n=5$.

Figure B56. Top 1% wealth share in Russia : benchmark vs variants (2)



Variants based upon varying slopes of correction factors $\text{corr}(p)$: linear between $p=0.99$ and billionaire level (benchmark) or piecewise linear with fraction f of total correction between $p=0.99$ and $p=0.999$. Number of adults per billionaire family $n=5$.

Figure B57. Top wealth shares in Russia : Forbes vs Finanz



Estimates obtained by combining Forbes and Finanz billionaire data for Russia, generalized Pareto interpolation techniques and average normalized wealth fistribution for USA-China-France. Benchmark series: number of adults $n=5$, linear $\text{corr}(\rho)$.

Table B10. Aggregate Russian Income Tax Data (2008-2015)

Description			Income year_t							
	Code	Source	2008	2009	2010	2011	2012	2013	2014	2015
TAX REVENUES OF PERSONAL INCOME TAX										
total taxes PIT (bln.rub.; before 1998 trillion rub.)	Stat.	Yearbook (Finans)	1 666	1 666	1 791	1 996	2 262	2 499	2 703	2 808
total taxes PIT (thd.Rub.)	1130	1NM	1 665 602 273	1 665 049 638	1 789 631 580	1 994 869 291	2 260 335 639		2 688 688 359	2 806 507 629
taxes payable according to PIT-3 (thd.Rub.)										
taxes payable withheld by tax agents (thd.Rub.)			1 561 937 054	1 588 938 035	1 866 915 662	1 972 900 269	2 219 353 256	2 483 351 939	2 687 589 515	2 825 269 743
Tax revenue/national income			4.4%	4.7%	4.2%	3.8%	3.8%	4.1%	4.1%	4.2%
SUMMARY: PIT WITHHELD BY TAX AGENTS										
Total assessable income (gross revenue) (thd. rubles)			20 565 462 966	23 818 734 313	28 331 426 563	25 312 710 657	24 490 497 797	25 492 643 254	25 768 813 677	26 945 921 773
% of national income			54%	67%	67%	48%	42%	41%	39%	41%
Total taxable income (thd. rubles)			12 130 510 016	12 347 333 254	14 294 726 260	15 270 361 088	17 196 238 196	19 252 672 745	20 941 823 317	21 650 661 438
% of national income			32%	35%	34%	29%	29%	31%	32%	33%
Total tax liability (thd. rubles)			1 561 937 054	1 588 938 035	1 866 915 662	1 972 900 269	2 219 353 256	2 483 351 939	2 687 589 515	2 825 269 743
Implicit tax rate			12.9%	12.9%	13.1%	12.9%	12.9%	12.9%	12.8%	13.0%
Implicit deductions rate			41.0%	48.2%	49.5%	39.7%	29.8%	24.5%	18.7%	19.7%
TYPES OF INCOME										
Wages and Salaries (thd. rubles)								18 079 262 480	19 306 816 543	20 049 022 053
% of nat. acc. category								66%	64%	62%
% of nat. acc. category (adjusted for hidden earnings)								102%	97%	94%
Dividends (thd. rubles)								771 444 731	1 189 644 353	1 008 573 996
Sales of securities (thd. rubles)								3 487 937 294	5 094 344 167	6 023 652 360
Deductions (claimed through tax agents)										
Standard tax deductions (thd. rubles)			138 151 495	347 847 834	338 076 469					
Property-related tax deductions (thd. rubles)			140 167 813	151 052 711	100 549 299					
Tax deductions on specific incomes (thd. rubles)			8 285 451 685	11 104 483 576	13 712 486 601	9 636 680 831	6 860 946 700	5 814 912 873	4 422 279 008	
of which on sale of securities, repo agreem., etc.			98%	98%	99%	99%	99%	98%	97%	0
Memo: MACRO SERIES		Source:								
National income (bln.rub.; before 1998 trillion rub.)	NPZ2017	Appendix A	38 072	35 316	42 465	52 966	58 851	61 668	66 413	66 413
Wages and salaries (bln.rub.; before 1998 trillion rub.)	NPZ2017	Appendix A	16 493	17 326	19 759	21 532	24 330	27 273	30 333	32 185
Official estimate of hidden employees comp. and mixed income (bln.rub.; before 1998 trillion rub.)					6 632	7 868	8 959	9 612	10 376	10 858
Net mixed income (bln.rub.; before 1998 trillion rub.)										
THE NUMBER OF TAX RETURNS AND TAXPAYERS										
The total number of registered 3-NFDL returns (units)	1010	1DDK/P1	7 545 363	6 569 187		7 870 191	8 346 045	8 771 417	9 678 197	10 011 015
of which [code 1010] the total number of registered 3-NFDL returns for income in year t (units)	1020	1DDK/P1	6 226 069	5 212 419		6 640 755	7 003 585	7 228 444	7 738 375	7 840 611
The number of taxpayers who submitted 3-NFDL return (persons)	1025	1DDK/P1	5 775 641	4 812 407		6 094 523	6 409 038	6 606 377	7 043 243	7 122 330
The total number of registered 3-NFDL returns, entered in the information resources of tax organs for the year t (units)	2001	1DDK/P2	6 203 705	5 204 476		6 622 307	6 977 803	7 203 944	7 703 924	7 811 824
The total number of registered 3-NFDL returns, entered in the information resources of tax organs for income in year t before the year t (units)	2002	1DDK/P2	1 292 808	1 338 421		1 223 356	1 335 300	1 535 244	1 932 524	2 159 430
[from codes 2001 and 2002], the total number of camerally verified declarations (units)	2010	1DDK/P2	7 072 639	6 168 824		7 455 356	7 852 391	8 250 357	9 067 339	9 371 141
[from code 2010], the number of camerally verified declarations for the year t (units)	2015	1DDK/P2	5 904 190	4 959 513		6 348 814	6 654 852	6 876 722	7 331 438	7 447 466
			95.2%	95.3%		95.9%	95.4%	95.5%	95.2%	95.3%
INCOME, TAXABLE INCOME, TAX LIABILITY : 3-ND										
[from code 2010] The total sum of assessable income (gross revenue) in verified declarations (thd. rubles)	2020	1DDK/P2	6 477 372 704	7 695 267 482		5 263 335 215	5 313 636 052	5 725 848 683	7 349 656 391	7 429 352 056
The total sum of taxable income according to declarations of income obtained in for the year 2008 (thousand rubles)	2170	1DDK/P2	1 458 243 037	1 043 000 620		1 307 742 782	1 342 786 147	1 545 156 434	1 974 808 912	1 936 515 010
The total sum of tax payable upon declarations of income obtained in 2008 (thousand rubles)	2180	1DDK/P2	189 604 174	129 016 743		165 546 382	166 833 404	193 102 161	238 982 773	254 412 840
Tax liability / taxable income			13.0%	12.4%		12.7%	12.4%	12.5%	12.1%	13.1%
Implicit tax deductions / assessable income			77.5%	86.4%	88.9%	75.2%	74.7%	73.0%	73.1%	73.9%
Assessable income in declarations/total assessable income			31.5%	32.3%		20.8%	21.7%	22.5%	28.5%	27.6%
Taxable income in declarations/total taxable income			12.0%	8.4%		8.6%	7.8%	8.0%	9.4%	8.9%
Assessable income per declaration			1 121 498	1 599 048		863 617	829 085	866 715	1 043 505	1 043 107

			252 482	216 732	214 577	209 514	233 889	280 383	271 893	
Tax withheld,...										
<i>Information on certain types of income in 3-NDFL form :</i>										
The number of taxpayers : income from the <u>sale of immovable property</u> ; income in year t	1200	1DDK/P1A						537 949	472 766	
Total income (thd.rubles)	1201	1DDK/P1A						639 627 020	571 172 766	
Total taxable income (thd.rubles)	1202	1DDK/P1A						121 726 000	104 375 189	
Total tax liability (thd.rubles)	1203	1DDK/P1A						15 824 380	13 546 619	
									13%	
The number of taxpayers : income from the <u>sale of other property</u> ; income in year t	1300	1DDK/P1A						881 229	806 314	
Total income (thd.rubles)	1301	1DDK/P1A						237 299 815	757 203 983	
Total taxable income (thd.rubles)	1302	1DDK/P1A						25 780 523	33 850 928	
Total tax liability (thd.rubles)	1303	1DDK/P1A						3 351 468	4 330 319	
									13%	
The number of taxpayers : income from the <u>operation with securities</u> ; income in year t	1400	1DDK/P1A						22 350	22 393	
Total income (thd.rubles)	1401	1DDK/P1A						817 240 934	977 124 295	
Total taxable income (thd.rubles)	1402	1DDK/P1A						82 038 646	92 656 090	
Total tax liability (thd.rubles)	1403	1DDK/P1A						10 665 024	12 078 580	
									13%	
The number of taxpayers : income from <u>leasing property/rent</u> ; income in year t	1500	1DDK/P1A						232 724	259 744	
Total income (thd.rubles)	1501	1DDK/P1A						24 662 442	28 405 124	
Total taxable income (thd.rubles)	1502	1DDK/P1A						22 873 138	25 269 828	
Total tax liability (thd.rubles)	1503	1DDK/P1A						2 973 508	3 361 744	
									13%	
The number of taxpayers : income <u>received as gift</u> ; income in year t	1600	1DDK/P1A						20 984	21 672	
Total income (thd.rubles)	1601	1DDK/P1A						4 602 655	7 003 643	
Total taxable income (thd.rubles)	1602	1DDK/P1A						3 775 815	5 769 622	
Total tax liability (thd.rubles)	1603	1DDK/P1A						490 856	751 605	
									13%	
The number of taxpayers : income from <u>labour (civil) contract, withheld by tax agents</u> ; income in year t									5 012 742	
Total income (thd.rubles)									2 419 035 315	
Total taxable income (thd.rubles)									2 375 203 193	
Total tax liability (thd.rubles)									310 958 102	
									13%	
The number of taxpayers : income from <u>labour (civil) contract, not withheld by tax agents</u> ; income in year t									108 718	
Total income (thd.rubles)									24 731 026	
Total taxable income (thd.rubles)									44 024 805	
Total tax liability (thd.rubles)									11 001 845	
									14.3%	
The number of taxpayers : income from <u>equity share in form of dividends</u> ; income in year t									27 764	
Total income (thd.rubles)									171 190 191	
Total taxable income (thd.rubles)									156 913 471	
Total tax liability (thd.rubles)									20 541 847	
									13%	
reported income for certain income sources									4 975 160 122	
reported taxable income for certain income sources									2 841 640 159	
TAX DEDUCTIONS : 3-NDFL tax form	<i>Code</i>	<i>Source</i>	2008	2009	2010	2011	2012	2013	2014	2015
SOCIAL TAX DEDUCTIONS on income in year t (thd. rubles)	<i>see formula</i>	1DDK/P2	42 305 056	45 230 943	0	46 803 124	50 704 650	56 226 662	66 100 443	
INVESTMENT TAX DEDUCTIONS										2 530 946
PROPERTY-RELATED TAX DEDUCTIONS on income in year t (thd. rubles)	<i>see formula</i>	1DDK/P2	3 509 792 081	5 450 093 736		2 540 690 549	2 499 897 470	2 695 092 667	3 744 167 007	3 821 639 616
PROFESSIONAL TAX DEDUCTIONS on income in year t (thd. rubles)	<i>see formula</i>	1DDK/P2	1 240 636 417	1 138 508 248		1 309 032 888	1 342 285 687	1 358 338 089	1 447 197 525	1 477 817 627

TOTAL TAX DEDUCTIONS (thd. rubles)			4 792 733 554	6 633 832 927	0	3 896 526 561	3 892 887 807	4 109 657 418	5 257 464 975	5 299 457 243
% OF IMPLICIT TAX DEDUCTIONS			95.5%	99.7%	#DIV/0!	98.5%	98.0%	98.3%	97.8%	96.5%
TAXATION OF ENTREPRENEURS AND OTHER SEL			2008	2009	2010	2011	2012	2013	2014	2015
The number of taxpayers that submitted declaration for income obtained in year t	3010	1DDK/P3	401 463	400 561		397 348	377 865	345 125	376 708	397 867
(from 3010) The total sum of assessable income (gross revenue) in relevant declarations (thd. rub.)	3020	1DDK/P3	1 595 758 362	1 436 410 658		1 600 110 994	1 614 571 486	1 625 163 650	1 783 347 930	1 853 274 205
(from 3020) The total sum of assessable income (gross revenue) from entrepreneurial activity and	3030	1DDK/P3	1 409 074 132	1 258 908 409		1 433 347 254	1 487 816 687	1 515 344 282	1 637 480 343	1 717 597 120
income from the entrepreneurial activity and private practice (units)	3040	1DDK/P3	274 000	281 153		276 938	273 840	247 502	279 140	300 993
The total sum of professional tax deductions claimed by taxpayers on incomes from entrepreneurial activity and private practice according to relevant provisions of income from entrepreneurial activity	3050	1DDK/P3	1 329 315 362	1 196 867 121		1 358 662 953	1 411 508 477	1 425 228 326	1 537 287 402	1 603 922 154
check P2, code 2150			94%	95%	#DIV/0!	95%	95%	94%	94%	93%
(from 3050) The total sum of taxable income indicated by taxpayers in relevant declarations (thd. rubles)	3070	1DDK/P3	167 045 239	98 816 996		111 472 079	120 977 461	125 471 668	143 213 715	154 933 571
implicit tax rate			79 758 770	62 041 288	0	74 684 301	76 308 210	90 115 956	100 192 941	113 674 966
(from 3070) The total sum of tax payable in relevant declarations (thd. rubles)	3080	1DDK/P3	14 416 248	12 549 445		14 203 879	15 336 778	15 881 253	18 176 831	20 196 626
implicit tax rate			8.6%	12.7%		12.7%	12.7%	12.7%	12.7%	13.0%
PIT WITHHELD BY TAX AGENTS - 13% FLAT TAX RA			2008	2009	2010	2011	2012	2013	2014	2015
The number of info/settlement (svedeniy) for income of individuals in year t, received by the tax authorities	1010	5NDFL	96 852 408	92 653 921	92 681 285	93 195 698	92 621 706	92 223 185	91 141 047	92 791 396
Total assessable income (gross revenue) (thd. rubles)	1020	5NDFL	20 113 910 718	23 387 152 247	27 234 322 577	24 682 266 056	23 740 363 786	24 647 557 902	24 501 973 518	26 814 583 922
Total taxable income (thd. rubles)	1030	5NDFL	11 719 598 939	11 962 009 990	13 470 648 463	14 683 464 611	16 482 485 648	18 448 335 932	19 749 106 411	21 535 286 290
Total tax liability (thd. rubles)	1040	5NDFL	1 512 849 551	1 544 141 569	1 708 702 659	1 908 281 573	2 142 501 661	2 398 244 576	2 567 468 160	2 799 863 352
Total tax withheld (thd. rubles)	1050	5NDFL	1 504 130 111	1 540 158 229	1 703 429 843	1 904 548 640	2 139 208 063	2 392 679 884	2 584 808 819	2 789 993 287
			12.9%	12.9%	12.7%	13.0%	13.0%	13.0%	13.0%	13.0%
PIT WITHHELD BY TAX AGENTS - 30% FLAT TAX RA			2008	2009	2010	2011	2012	2013	2014	2015
The number of info/settlement (svedeniy) for income of individuals in year t, received by the tax authorities	2010	5NDFL	744 974	545 746	506 241	582 115	658 867	643 880	621 264	328 165
Total income (thd. rubles)	2020	5NDFL	57 500 124	58 882 715	636 985 373	56 174 482	53 145 732	54 892 585	55 321 021	49 303 972
Total taxable income (thd. rubles)	2030	5NDFL	43 381 047	36 957 950	392 805 386	41 484 127	46 989 408	48 361 880	48 651 451	37 585 957
Total tax liability (thd. rubles)	2040	5NDFL	12 740 412	10 913 554	115 101 287	12 362 701	13 997 113	14 410 109	14 513 108	11 088 532
Total tax withheld (thd. rubles)	2050	5NDFL	12 332 173	10 697 311	11 306 458	12 098 027	13 771 942	14 136 320	14 374 617	10 811 351
			29.4%	29.5%	29.3%	29.8%	29.8%	29.8%	29.8%	29.5%
PIT WITHHELD BY TAX AGENTS - 9% FLAT TAX RA			2008	2009	2010	2011	2012	2013	2014	2015
The number of info/settlement (svedeniy) for income of individuals in year t, received by the tax authorities	3010	5NDFL	3 383 952	2 941 179	3 046 585	3 602 913	3 093 022	3 007 734	2 917 472	20 109
Total income (thd. rubles)	3020	5NDFL	377 973 305	357 727 109	437 006 364	554 497 109	676 177 184	769 205 095	1 186 252 110	4 103 549
Total taxable income (thd. rubles)	3030	5NDFL	351 847 298	333 775 652	408 392 665	526 334 874	646 534 692	735 421 202	1 119 702 367	4 031 363
Total tax liability (thd. rubles)	3040	5NDFL	31 713 851	29 955 241	36 750 855	47 356 164	58 178 336	66 172 572	100 734 026	490 708
Total tax withheld (thd. rubles)	3050	5NDFL	31 649 509	30 007 516	36 642 571	47 183 451	58 054 851	65 901 234	100 619 677	697 193
			9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	12.2%
PIT WITHHELD BY TAX AGENTS - 35% FLAT TAX RA			2008	2009	2010	2011	2012	2013	2014	2015
The number of info/settlement (svedeniy) for income of individuals in year t, received by the tax authorities	4010	5NDFL	3 875 212	2 080 589	2 407 986	1 134 930	880 281	722 166	925 459	2 375 922
Total income (thd. rubles)	4020	5NDFL	12 236 143	9 541 671	15 457 436	11 327 585	9 532 113	8 482 523	7 396 791	18 543 174
Total taxable income (thd. rubles)	4030	5NDFL	11 909 507	9 288 326	15 331 168	10 912 024	9 113 006	8 091 820	7 018 977	18 130 222
Total tax liability (thd. rubles)	4040	5NDFL	4 104 287	3 182 001	5 286 277	3 767 364	3 135 978	2 804 930	2 436 199	6 250 225
Total tax withheld (thd. rubles)	4050	5NDFL	3 746 348	2 827 398	4 554 666	3 230 691	2 481 062	2 040 566	2 134 648	5 967 989
			34.5%	34.3%	34.5%	34.5%	34.4%	34.7%	34.7%	34.5%
PIT WITHHELD BY TAX AGENTS - 15% FLAT TAX RA			2008	2009	2010	2011	2012	2013	2014	2015
The number of info/settlement (svedeniy) for income of individuals in year t, received by the tax authorities	5010	5NDFL		8 586	10 735	11 861	11 074	11 429	9 860	10 410
Total income (thd. rubles)	5020	5NDFL		1 812 530	2 871 164	2 827 380	4 587 642	4 454 105	6 284 656	16 647 029
Total taxable income (thd. rubles)	5030	5NDFL		1 797 807	2 854 176	2 816 213	4 583 042	4 448 085	6 271 369	14 676 288
Total tax liability (thd. rubles)	5040	5NDFL		262 892	422 036	414 280	655 012	663 840	935 971	2 170 075
Total tax withheld (thd. rubles)	5050	5NDFL		258 126	415 196	408 567	645 740	657 106	931 940	2 045 734
				15%	14.8%	14.7%	14.3%	14.9%	14.9%	14.8%
PIT WITHHELD BY TAX AGENTS - other tax rates			2008	2009	2010	2011	2012	2013	2014	2015

2014	n	p	a	b	n	p	a	b	
1	6 354 278	0.938318076	0.16826259		43 648	0.999231135	0.04976225		1%
1 000 000	654 754	0.993966318	1.304031391	4.289134049	29 142	0.999613387	0.468684303		4%
10 000 000	28 950	0.999700394	0.813097467		12 003	0.999868601	0.69894106		41%
100 000 000	4 221	0.999953926	1.007246317	139.0011408	2 470	0.999973718	1.076114096	14.13817089	59%
500 000 000	613	0.999990892	1.284275553	4.517713669	329	0.99999535	1.394356568	3.535776201	54%
1 000 000 000	404	0.999996261	1.268700039	4.721622089	202	0.999998231			47%
10 000 000 000	23	0.999999799							
Total declarations	7 043 243	6.17%	Average gross revenue		87 794		Average gross revenue		1%
Total ≥1 000 000	688 965	0.60%	1 781 649		44 146		33 499 100		6%
Total adult pop.	114 186 500								
2015	n	p	a	b	n	p	a	b	
1	6 446 648	0.938033288	0.17047996		42 687	0.999240538	0.04859928		1%
1 000 000	640 300	0.994121335	1.280959971	4.559225875	28 669	0.99961193	0.447021739		4%
10 000 000	29 988	0.999692164	0.816871436		12 894	0.99986136	0.719335648		43%
100 000 000	4 383	0.99995307	1.040330461	25.79515449	2 508	0.999973542	1.082005245	13.19434189	57%
500 000 000	587	0.999991204	1.253646827	4.942489683	328	0.999995363	1.378511623	3.641926796	56%
1 000 000 000	398	0.999996311	1.212392509	5.708263988	205	0.999998216			48%
10 000 000 000	26	0.999999774							
Total declarations	7 122 330	6.20%	Average gross revenue		87 291		Average gross revenue		1%
Total ≥1 000 000	675 682	0.59%	1 768 869		44 604		34 529 253		7%
Total adult pop.	114 938 000								

Notes. (1) Published income tax tabulations for Russia solely include frequency data (i.e. numbers of taxpayers per gross revenue bracket) and no mean-income data (i.e. mean or total gross revenue per bracket). Here we report a crude estimate of "average gross revenue" obtained by assuming mean-bracket averages (see formula), which clearly over-estimates the true average (because of declining density); indeed we find averages around 2 million rubles, as opposed to about 1 million rubles in aggregate income tax statistics (see Table B10).

(2) The table PIT3-P1 includes all taxpayers submitting an income declaration 3-NDFL. In principle, taxpayers whose income is entirely reported by tax agents (i.e. wages reported by employers, interest and dividends reported by banks or firms) do not need to submit such a declaration (i.e. the 13% income tax withheld at source is considered as final). I.e. the declaration 3-NDFL is compulsory solely for taxpayers who also receive other income flows (such as entrepreneurial income, capital gains, foreign income, gifts, etc.) on which the tax has not been withheld at source. However taxpayers who do not receive such income flows must also submit a declaration 3-NDFL in case they want to claim personal deductions (such as deductions for charitable giving, education or health expenses, mortgage payments, etc., with the exception of deductions for dependent adults and children, which are already taken into account at source).

(3) Table PIT3-P3 includes only the taxpayers with entrepreneurial income submitting an income declaration 3-NDFL. The complete table also includes a bracket-level breakdown of entrepreneurs into "individual entrepreneurs", "heads of peasant farms", "notaries and other with private practice", lawyers".

(4) There are several important limitations about this data: (i) The fraction of adult population submitting a declaration is about 5%-6% throughout the period. It is clear that it must rise from less than 5% below one million rubles to close to 100% in very top brackets (high-income taxpayers have stronger incentives to claim large personal deductions and are more likely to have non-wage income), but we do not know exactly at what speed it goes from 5% to 100%. (ii) The raw tables (both PIT3-P1 and PIT3-P3) use are based upon "gross revenue", i.e. total revenue before any deduction (such as professional expenses for holders of entrepreneurial income, or asset acquisition price and other costs for holders of capital gains, etc.) rather than "taxable income" (i.e. gross revenue minus all deductions; by construction income tax liability equals 13% of taxable income). Available data show that total deductions represent about 75% of gross revenue throughout the period, but we do not know how this average ratio varies across brackets. (iii) These two limitations explain why Pareto coefficients a (estimated via log-linear interpolation, because of the lack of mean-income data) are so close to 1, so that inverted Pareto coefficients $b=a/(a-1)$ are so unplausibly high (i.e. 5-10 or more instead of 2-4). See next table for different possible assumptions about correction factors.

Table B12. Corrected Russian Income tax tabulations, 2008-2015

Annual taxable income threshold in current rubles [thry=thr*(1-r)]	Corrected table based upon all taxpayers submitting a declaration 3-NDFL (table PIT3 P1) (all income sources included)				Exemple of correction factors	
	Corrected number of taxpayers ny=n/y in bracket [thry _i ,thry _{i+1} [Fraction of adult population with income y≤thry _i	Log-linear Pareto coefficient a $a=\log[(1-py)/(1-py_{i+1})]/\log[thry_{i+1}/thry_i]$	Inverted Pareto coefficient b $b=a/(a-1)$	Declaration rate: fraction of taxpayers in gross revenue bracket [thr _i ,thr _{i+1} [submitting a declaration	Deduction rate: average ratio deductions/(gross revenue) in gross revenue bracket [thr _i ,thr _{i+1} [
2008	ny	py	a	b	f	r
0	103 146 446	0.00000000	0.188058153		5%	77%
225 129	7 795 018	0.925586611	1.221864276	5.507260098	6%	77%
2 251 288	475 743	0.995535356	1.358515533	3.789279423	7%	77%
22 512 878	19 316	0.999804444	1.351213377	3.847271961	25%	77%
112 564 392	1 529	0.999977776	1.385385267	3.594805991	35%	77%
225 128 783	910	0.999991493	1.397024741	3.518734722	50%	77%
2 251 287 835	38	0.999999659			100%	77%
Total taxpayers	111 439 000	100.00%				
Total adult pop.	111 439 000					
2009	n	p	a	b	f	r
0	106 970 995	0.00000000	0.221226667		4%	80%
200 000	4 872 709	0.952941292	1.110272628	10.06843353	6%	80%
2 000 000	389 657	0.996349374	1.308541682	4.241053183	7%	80%
20 000 000	17 748	0.999820599	1.324162414	4.084873379	25%	80%
100 000 000	1 591	0.999978705	1.581001889	2.7211648	35%	80%
200 000 000	770	0.999992882	1.440148781	3.271959034	50%	80%
2 000 000 000	29	0.999999742			100%	80%
Total declarations	112 253 500	100.00%				
Total adult pop.	112 253 500					
2010	n	p	a	b	f	r
0	106 080 446	0	0.20994997		5%	80%
200 000	5 795 291	0.945007916	1.213280651	5.688657857	6%	80%
2 000 000	358 386	0.996634733	1.289926476	4.449150331	7%	80%
20 000 000	16 864	0.99982738	1.269083186	4.7163229	25%	80%
100 000 000	1 654	0.999977611	1.548844652	2.822009191	35%	80%
200 000 000	832	0.999992348	1.5026294	2.989537422	50%	80%
2 000 000 000	27	0.999999759			100%	80%
Total taxpayers	112 253 500	100.00%				
Total adult pop.	112 253 500					
2011	n	p	a	b	f	r
0	105 413 470	0	0.19516856		5%	75%
248 463	7 224 236	0.932548964	1.27983416	4.573545072	6%	75%
2 484 628	380 529	0.996458767	1.30647583	4.262900058	7%	75%
24 846 276	17 056	0.999825145	1.23474296	5.259978725	25%	75%
124 231 379	1 834	0.999976032	1.63055762	2.585897885	35%	75%
248 462 758	860	0.999992259	1.76591679	2.305624851	50%	75%
2 484 627 577	15	0.999999867			100%	75%
Total taxpayers	113 038 000	100.00%				
Total adult pop.	113 038 000					
2012	n	p	a	b	f	r
0	104 073 589	0.00000000	0.18155087		6%	75%
252 706	8 826 691	0.91858681	1.365883993	3.733106724	6%	75%
2 527 057	378 800	0.996494009	1.333741481	3.996331161	7%	75%
25 270 571	16 064	0.999837419	1.27775775	4.600259584	25%	75%
126 352 853	1 580	0.999979205	1.602210982	2.6605476	35%	75%
252 705 705	766	0.999993151	1.889861721	2.123770105	50%	75%
2 527 057 054	10	0.999999912			100%	75%
Total taxpayers	113 297 500	100.00%				
Total adult pop.	113 297 500					
2013	n	p	a	b	f	r
0	103 082 842	0.00000000	0.17381252		6%	73%
269 856	9 869 818	0.909400692	1.409669899	3.440989691	6%	73%
2 698 563	381 586	0.996472598	1.340524639	3.936645066	7%	73%
26 985 632	15 944	0.999838961	1.284350691	4.516784142	25%	73%

134 928 158	1 577	0.99997962	1.656096966	2.524164951	35%	73%
269 856 316	720	0.999993533	1.751160622	2.331273193	50%	73%
2 698 563 164	13	0.999999885			100%	73%
Total taxpayers	113 352 500	100.00%				
Total adult pop.	113 352 500					
2014	n	p	a	b	f	r
0	101 848 844	0.00000000	0.16106368		6%	73%
268 694	11 904 618	0.89195171	1.454706793	3.199219397	6%	73%
2 686 940	413 571	0.996207626	1.347239584	3.879855998	7%	73%
26 869 405	16 884	0.999829521	1.255072402	4.920455489	25%	73%
134 347 023	1 751	0.999977384	1.635808063	2.572801695	35%	73%
268 694 046	808	0.999992722	1.557873188	2.792522068	50%	73%
2 686 940 459	23	0.999999799			100%	73%
Total taxpayers	114 186 500	100.00%				
Total adult pop.	114 186 500					
2015	n	p	a	b	f	r
0	102 847 751	0.00000000	0.16300473		6%	74%
260 657	11 641 818	0.894810686	1.430739491	3.321588852	6%	74%
2 606 573	428 400	0.996098495	1.349990038	3.857224183	7%	74%
26 065 732	17 532	0.999825722	1.293209495	4.410530758	25%	74%
130 328 661	1 677	0.999978257	1.604223073	2.655017898	35%	74%
260 657 322	796	0.999992848	1.49989847	3.000406204	50%	74%
2 606 573 219	26	0.999999774			100%	74%
Total taxpayers	114 938 000	100.00%				
Total adult pop.	114 938 000					

Notes. These corrected income tax tabulations take into account the fact that only a fraction of taxpayers need to submit a declaration, and that raw tabulations use "gross revenue" rather than taxable income. In effect, tax-data correction factors need to make two assumptions, about the declaration-rate profile and the deduction-rate profile: (1) The profile (number of declarations)/(number of taxpayers) follow a rising profile such that the implicit inverted Pareto coefficients have "reasonable value" (2-4 rather than 5-10). Alternative correction factors are presented in the following table.(2) The simplest assumption for deductions is to assume a flat profile: i.e. the deductions/(gross revenue) ratio can be assumed to be constant across brackets and equal to the average ratio observed in aggregate income tax statistics (see Table B10); alternatively one could assume an upward-sloping profiles (see variants).