

Measuring Unfair Inequality in Russia

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Abstract

The relationship between economic development and inequality is a contested topic with much relevance to public policy. However, the discussion has been dominated by measures that assume the equality of outcome as a normative ideal - an understanding of equality that is not widely shared. This paper follows the design of Hufe, Kanbur & Peichl (2018) using a measure that is more in line with the common understanding of equality. It focuses on two key principles: Equality of Opportunity and Freedom from Poverty. The paper measures unfair inequality in Russia from 1994s onward - a period of rapid economic collapse and ascendance. Both mean log deviation and unfair inequality measure suggest a significant decline in inequality. The point-estimate of unfair inequality as a share of total inequality declines dramatically from 60% in 1998 and from 2010 stays relatively constant around 20%. Decomposition of the unfair inequality measure suggests that Freedom from Poverty has been the most significant contributing factor throughout this period with Inequality of Opportunity increasing in later years.

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1 Introduction

There is an extensive literature within economics investigating inequality and its effect on growth. Initially, it was predicted that inequality would follow a reverse Kuznets U-curve, and it will increase as countries start to grow and decrease afterwards (van der Hoeven 2019). Evidence, however, points that inequalities have been persisting and even where they do fall, they fall very slowly.

Modern literature highlights the negative impact that inequality can have on economic development and vice versa. Inequalities can have a tangible effect given the increase in intangible investments (Haskel & Westlake 2018). In this view, high-paid jobs can become clustered in intangible-intensive firms (such as many tech companies) due to both synergy and spillovers. Inequality can adversely affect quality of institutions and high schooling (Easterly 2006). Causation can also run the other way round. Others, like Piketty (2013) highlight how slow economic growth can fuel a rise in inequality and that this inherent feature of capitalism can only be alleviated by state interventionism.

In Besley & Persson (2011) state capacity development model income inequality can have a significant effect. Low inequality does not affect the optimum much, with fiscal capacity being fully utilised in all cases. However, as one moves to higher levels of inequality, richer incumbents will have less and less incentive to develop fiscal capacity (i.e. state capacity to collect taxes), as the potential of poorer incumbent coming to power and tax the incumbent rich would be too dangerous.

All these causal chains show the importance of understanding inequality. And to study it, it is important to correctly operationalize the phenomenon. Nevertheless, most popular inequality measures that are used both in academic studies and in policy discussions make normative assumption that are not widely shared. For example, one of the most widely used measures - the Gini coefficient - implicitly assumes that every decile of the population should earn the same proportion of income and, in this way, embraces the equality of outcome - an ethical position that few people share.

This paper will instead apply a measure developed by Hufe, Kanbur & Peichl (2018) to evaluate inequality in Russia between 1994 and 2018 that comes as a result of the violation of two normative principles: equality of outcome and freedom from poverty. It will proceed in 3 main steps: first, a brief discussion of inequality and its potential causes in Russia will be presented; second data cleaning will be explained, and finally, the descriptive statistics and inequality measurement with decomposition will be presented.

2 Review of Inequality in Russia

2.1 Inequality

There has been significant discussion of inequality and poverty in Russia, especially since the economic turbulence of 2014-2018 (Vedomosti 2015, Zakharov 2015, Ovcharova 2015). The fall of oil and ruble, coupled with

double-digit inflation, have increased worries that a part of the population that was already in a precarious position is getting worse.

There is a cause for cautious optimism. While data from the 1990s suggest the inequality in Russia was very high Milanovic (1998), Mareeva & Tikhonova (2016) based on official government data, highlight a dramatic fall in absolute poverty rate with people below the poverty line accounting for 28.4% (41.6 million) of the population in 1999 but only 11.2% (16.1 million) in 2014. However, studies also indicate an increase in Russia's inequality level. In a book Kostyleva (2011) highlights that Russia's economic growth has been highly concentrated in upper incomes: bottom 20% in 2000 earned on average 0.56x of the cost of living while top 20% earned 4.4x; in 2009 these were 0.84x and 7.89x respectively. She also highlighted that in 2009 top 20% owned 44% of the income while the rest was spread among the remaining 80% and 40% of the population was „on the brink of survival“ (p.49).

There has also been concern expressed about reliance on official figures in calculations of inequality rates. Novokmet, Piketty & Zucman (2018) argue, based on a combination of national account, survey, wealth and fiscal data, that official inequality estimates vastly underestimate the increase in inequality rates since 1990. Their estimates of inequality show that the share of top 10% of income earners increased from approximately 25% in 1993 to around 50% in 1996 and remained above 45% up until 2015. Meanwhile, top 1% share increased from 10% in 1992 to 25% in 2000.

However, while most studies focus on inequality rate with measures that mainly assume equality of outcome as their normative ideal, there is evidence that people do not mind inequality if it has been achieved by fair means. Mareeva & Tikhonova (2016) cite a poll, conducted in 2012 and 2013, asking people about fairness of inequality. By a large margin (6% to 74%) people agreed with the statement that people, who work more efficiently and faster, deserve a higher salary than the people who are less productive in the same job. They also agreed (12% to 65%) that if people had equal opportunities, income inequality is justified. A different poll from 2015 shows that both on a personal level and for society generally income inequality is taken to be one of the most unhealthy inequalities in the country. Thus, a more nuanced look at the level of inequality is necessary that would account for various causes of inequality.

2.2 Sources of Inequality

There has been a debate on the source of inequality. Concerning geographical impact, Yemtsov (2005) using regionally representative Household Budget Survey claim that the largest share of inequality comes from within regions, but unlike other European countries where this accounts for 90-95%, in Russia, within-region inequality accounts for 70%. At the same time increase in inequality between regions accounted for 85% of the growth in inequality between 1994 and 2000. Jansen, Dessens & Verhoeven (2013) analyse the change in inequality in Russia in the pe-

riod 1992 to 2002 and decompose Gini coefficient into within-group (unexplained) and between-group (explained) parts. They conclude that in the first half of this period only a small part of the change in inequality could be explained, but in the second one changes in between-group inequality accounted for approximately 40% of inequality changes.

Russia is the largest country in the world where different regions are endowed with different amounts of resources. Given the fact that post-Soviet Russia had much less redistribution than in the Soviet system, this implies more inter-regional disparity. Still, differences between regions explain only a third of inequality (Remington 2011). Remington cites different institutional setups of Russian regions as assisting or hampering both economic development and inequality. According to this argument, some regional governments created a more open environment with less predatory behaviour that encouraged cooperation between businesses and local governments. This led to higher incomes, lower poverty and higher income inequality as incomes of high earners rose relative to the median. By contrast, in more corrupt and personalistic regions, redistribution prevented productive economic activity and prevented both incomes and inequality from rising.

Some of the regional inequalities also put bigger cities at a considerable advantage in the modern economy. For example, Bykov & Hull (2011) find regional disparities in terms of internet access and price, with much better availability in Moscow and St Petersburg.

Another source of inequality would be the discrimination faced by different groups in the labour market. An experiment carried out by Bessudnov & Shcherbak (2018) involved sending out resumes, which were identical except for variation of names, to over 9000 job advertisements. Their results indicate that employers in Moscow and St Petersburg treated applications from people of European descent better than those of Southern origins. While Russians, Jews and Germans had a callback rate of around 35-40%, Armenians, Azerbaijanis and Tatars received less than 30%. Interestingly, they did not find any significant discrimination in Kazan and Ufa, suggesting that even with regards to ethnic discrimination there might be regional variations as employers in national republics are less likely to engage in discriminatory practices.

In addition to ethnic discrimination, there is also evidence of gender discrimination in the labour market (Atencio & Posadas 2015, Maltseva & Nesterova 2010). While some estimates show that women face "motherhood penalty" (Arzhenovski & Artamonova 2007, Biryukova & Makarentseva 2017), men are likely to face "fatherhood premium" (Oshchepkov 2020). Nevertheless, this field requires further research and current studies indicate that while these effects exist and are statistically significant, their overall impact is not materially significant. "Fatherhood premium" and "spouse premium" are estimated at 2.5-3% while "motherhood penalty" at approximately 4%.

Income inequality can perpetuate itself also through outcomes such as lower health-

care quality and worse educational opportunities. According to WHO in 2009, mortality among working-age people in Russia was much higher than in other European countries (except Ukraine), and part of this is a result of income inequality affecting health-care. In 2000 16.7% of poll respondents said that they do not have enough money to buy medicine - this decreased to 7.6% by 2010 (Potapchik et al. 2011). In 2009 around 10% of respondents said they were not able to afford dental treatment; poorer people are less likely to receive ambulatory treatment (Potapchik et al. 2011) while in Moscow, infant mortality was found to be statistically related to the reliance on aid as an income source of residents of city district (Grafova et al. 2019). And with the move away from free and universal Soviet higher education, there is an increasing differentiation that makes educational outcomes dependent more on parents' financial well-being, occupation and willingness than student's abilities and effort (Konstantinovsky 2012). The financial accessibility of higher education can also vary significantly from one region to another (Higher School of Economics 2016), linking back to regional disparities.

3 Data Cleaning

The paper used data from the Russia Longitudinal Monitoring Survey, RLMS-HSE (2018) covering the period from 1994 to 2018 except for 1997 and 1999 when the survey was not conducted. The analysis has been done on an individual level. Note that for all

variables, the values of "Does not know", "Refuses to answer", "No answer" and, in case of some, "Died" have been removed. An additional check has been done, to ensure that these values do not vary as a share of total observations from year to year.

Data Cleaning involved two main stages. In the first stage, the data relevant to types were cleaned. Since this paper aimed to follow Hufe, Kanbur & Peichl (2018) (from here called HKP) and Hufe, Peichl & Weishaar (2019) as closely as possible, parental education and occupation were used to construct types. However, in this survey, the data were collected only in two years - 2002 and 2011. As such, only individuals who gave their parental education and occupation in either of those years were considered. This significantly diminishes the sample.

Occupations in the original dataset were listed according to the International Standard Classification of Occupations (ISCO-08) and, following HKP, these have been divided into three groups. For each person, the value of father's and mother's education has been calculated separately. The highest value of these variables was filled for all years of a given individual.

A similar process was done with the education variable. The original dataset divided education into twelve groups and the author aggregated these into three groups, making them close to HKP's "Dropped out of secondary education", "attended secondary education" and "attended at least some tertiary education".

Next, the variable for nationality is cleaned. In this respect, the author has de-

cided to take a break from Hufe, Peichl and Kanbur (2018) and include nationality (i.e. ethnic background) instead of urbanicity of the place of birth to explore the amount of unfairness generated by ethnic differences. Since Russians dominate the sample, collectively comprising 88% of the dataset, and since many ethnic groups have only one representative, the author has decided to break this variable into two groups: Slavic peoples and Europeans in one group and everyone else in the other.

Finally, the types were created. The new 'type' variable was assigned to each observation based on parental occupation, parental education, gender (this was checked, and all values were either male or female) and nationality. As a result of variables changes, there are three types of parental education, three types for parental occupation, two types of gender and two types of nationality with a total of 36 types.

In the second stage, the outcome variable was cleaned. Since the questionnaire asked about the total income for the past month, some people reported no income, but non-zero working hours. In the preliminary dataset, this constituted approximately 1% of the dataset, and these values were removed. Next, values were adjusted for inflation. Unlike HKP, which used Penn World Tables to adjust for purchasing power changes, this paper uses IMF data on inflation IMF (2020). The reason is that the former collected data until 2017 but this study has 2018 data as well. In addition, the paper also adjusted incomes before 1998 by a factor of 1000 due to the redenomination of Ruble in 1998.

Thirdly, the final dataset that we work with includes only those individuals who reported parent education and occupation in the two years when this question was asked, with the first year being 2002. This potentially introduces a bias in the sample, which is why this study considers some descriptive statistics before discussing the unfair inequality measure. Finally, values of zero were replaced with one to make log transformation possible, and the data was winsorized at 1% from the lower tail and 0.5% from the upper tail.

Finally, for the poverty threshold this paper initially followed Hufe et al. (2018) and used 60% of the year-specific median income as the poverty threshold. However, due to significant income changes in this period, in particular the rapid drop of income in the late 1990s, this measure became too low. For this reason, this paper followed the Russian national "minimum subsistence income" [Прожиточный минимум]. This was developed in 1997, and it includes money necessary for food as well as other goods and services. The calculation of this minimum was changed in 2000. This paper used the information on the minimum income from two sources (for both 1st quarter of the year was taken and only for the working-age population): Elizarov (2002) for the period before 2000 and ROSSTAT (2020) for the period after 2001.¹

¹All codes and data files for the project are available in a Github repository: <https://github.com/edgarakopyan/Measuring-Unfair-Inequality-in-Russia>

4 Descriptive Statistics

4.1 Headcount Ratio, Poverty Gap, Watts Index and Gini Coefficient

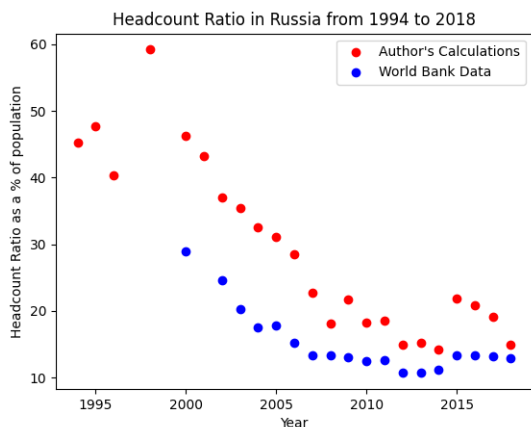


Figure 1: Headcount Ratio

Before examining the unfair inequality measure, it is worth to look at the dynamics offered by traditional measures of inequality: the headcount ratio, poverty gap, Watts Index and Gini coefficient. This functions as a check on the data cleaning process to see how well the resulting data matches the existing measures of inequality.

As one can see in the Figure 1, the headcount ratio - which is the share of people falling below the poverty line - is consistently higher in this sample than WorldBank (2020) estimates and more dramatically. It reaches the maximum value of 59% in 1998 and comes down afterwards with the lowest value in 2014 of approximately 11%. Notably, it has increased after the financial crisis in 2014-2015,

confirming the worries of many that many people have been pushed into poverty. However, this has come down afterwards as the effect of the crisis were subdued. Due to time constraints, this study has not been able to adjust for sample weights, and this can also account for some part of the discrepancy. However, it is worth noting that the direction of both this paper's estimates and World Bank's agree with each other and the estimates of this paper are close to other estimates encountered in the literature - another paper based on RLMS put the Headcount at 37% in 1996 WorldBank (1999) - and that the ratio agrees with World Bank estimates in latter dates.

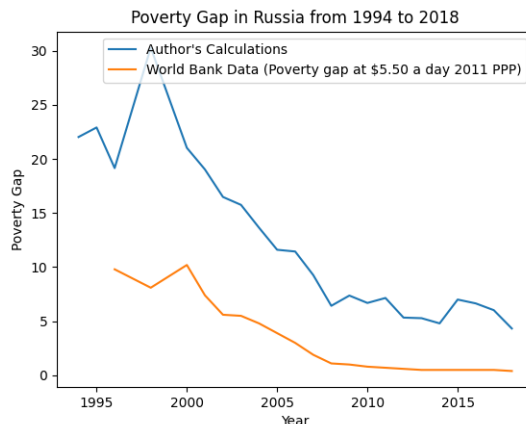


Figure 2: Poverty Gap

However, the headcount ratio generally has the disadvantage of not showing the extend of poverty: it shows how many people fall below the poverty line but does not capture how far below poverty line people are. For a better picture, we look at the Poverty Gap in Figure

2, which measures the average poverty gap relative to the poverty line. As the case with the headcount ratio, the measure from the survey does not coincide well with the World-Bank (2020) - it is much higher. However, it is worth noting that WorldBank (2020) does not have a measure of the poverty gap using the national poverty line. As a result, the one presented here is \$5.50 (2011 PPP) a day which, in 2011, was less than half of Russia's poverty threshold. Because of this, one would expect the World Bank to underestimate the poverty gap significantly.

Finally, the Poverty Gap index does not consider the inequality among the poor, and it is worth looking at the development of the Watts Index. Gini coefficient, as one of the most popular and common inequality measures, should be explored as well.

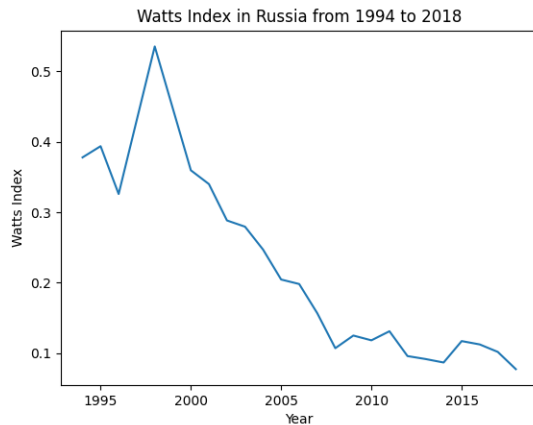


Figure 3: Watts Index

Figure 3 demonstrates Watts Index. As we can see, according to this index the value is high in the 1990s and peaks in 1998 at

0.53, coming down afterwards and reaching the lowest value in 2018. This is consistent with some of the previous data of the World-Bank (2020) in terms of inequality dynamics. Unfortunately, there is no other Watts Index estimation offered by any international body to be used for comparison.

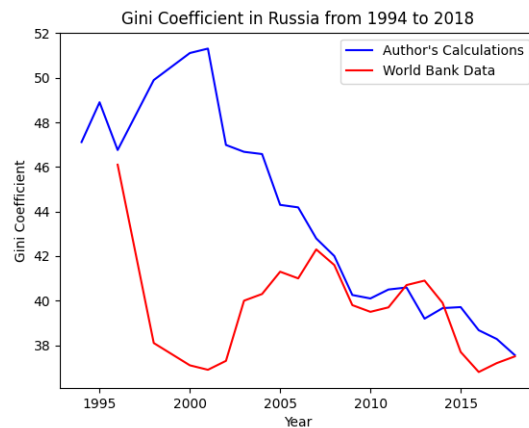


Figure 4: Gini Coefficient

The situation with the Gini coefficient - shown in Figure 4 - demonstrates interesting pattern. One apparent thing is that both this paper estimates and World Bank estimates are very high, especially for earlier dates. The values of both the dataset of this paper and WorldBank (2020) are very closely related in the late 2000s and up until 2018, and both show a decreasing trend. However, trends of the 1990s are the opposite - while the World Bank says the inequality decreased rapidly, this paper's data suggests that it increased. Another paper that uses the same survey data Lisina & Kerm (2019) also suggests that the Gini coefficient, con-

trary to what World Bank says, increased, peaking at approximately 0.5 in 1998. Thus, it seems to be a fundamental difference between the dataset that the World Bank uses and RLMS. This is also present in the literature generally as various datasets can significantly alter estimates of the Gini coefficient in Russia - Jansen, Dessens and Verhoeven (2013), for example, use other 15 survey datasets and conclude that Gini coefficient rose to 0.4 in 1995 and stayed at approximately that level up to 2001. This is also consistent with the criticism, raised by Novokmet, Piketty & Zucman (2018), that relying on national accounts in Russia may severely underestimate inequality.

5 Estimating Unfair Inequality

5.1 Main Results

Finally, we estimate the level of unfair inequality in Russia. The measure for unfair inequality measure is taken from Hufe, Kanbur & Peichl (2018):

$$\begin{aligned} & \frac{1}{N} \sum_{i \in P} \left\{ \ln \frac{y_{min}}{y_i^e} - \left(\frac{y_{min} - y_i^e}{y_{min}} \right) \right\} + \\ & \frac{1}{N} \sum_{i \in R} \left\{ \ln(1 - \tilde{y}_i(\tau^{FfP} + \tau_t^{EOP}(1 - \tau^{FfP}))) \right\} + \\ & \frac{1}{N} \sum_{i \in R} \left\{ \frac{\tilde{y}_i(\tau^{FfP} + \tau_t^{EOP}(1 - \tau^{FfP}))}{1 - \tilde{y}_i(\tau^{FfP} + \tau_t^{EOP}(1 - \tau^{FfP}))} \right\} \end{aligned}$$

where:

$$y_{min}$$

is the poverty threshold,

$$\tilde{y}_i = \frac{y_i^e - y_{min}}{y_i^e}$$

,

$$\tau^{FfP} = \frac{N_P(y_{min} - \mu_P^e)}{N_R(\mu_R^e - y_{min})}$$

for P poor population (i.e. below the poverty threshold) and R the rich (i.e. above the threshold),

$$\begin{aligned} \tau_t^{EOP} = & \frac{\mu_t^e + \frac{N_{P \cap t}}{N_t}(y_{min} - \mu_{P \cap t}^e) -}{\mu_t^e + \frac{N_{P \cap t}}{N_t}(y_{min} - \mu_{P \cap t}^e) -} \\ & \frac{-\tau^{FfP} \frac{N_{R \cap t}}{N_t}(\mu_{R \cap t}^e - y_{min}) - \mu}{-\tau^{FfP} \frac{N_{R \cap t}}{N_t}(\mu_{R \cap t}^e - y_{min}) - y_{min}} \end{aligned}$$

Figure 5 shows the mean log deviation (MLD) - the measure of total inequality - and the estimate of unfair inequality as a percentage of total inequality with 95% confidence interval (the confidence interval is obtained using bootstrap of 500 tries with a sample of 500 from each year).

The mean log deviation rises until 2001 and dramatically falls since then. While this may seem surprising, this result is close to the one obtained by Lisina & Kerm (2019) using the same RLMS dataset. In comparison to Hufe et al. (2018) paper, this MLD of Russia in 2010 is equal to the MLD of the US. Furthermore, while the US saw an increase in the amount of unfair inequality from 1995 to 2012, the Russian one has been declining. The unfair inequality as a share of total inequality rises substantially in the late 1990s up to 60% in 1998 and falls after that

to around 20% by 2018. Comparing to European estimates of unfair inequality, Russian one is close to Estonia and Latvia (but Russian MLD - 0.3 - is higher than either of them - 0.19 and 0.22). It is interesting to note that the economic crisis from 2014 does not seem to have much impact on either the trend of unfair inequality or on the amount of total inequality.

Meanwhile, 95% confidence intervals are wide and broadly fall within the range of confidence interval of inequality of opportunity of Hufe et al. (2019), albeit a bit smaller range. This is to be expected as this paper uses fewer variables for types - for instance, this paper used nationality in place of urbanicity of birth and did not use height.

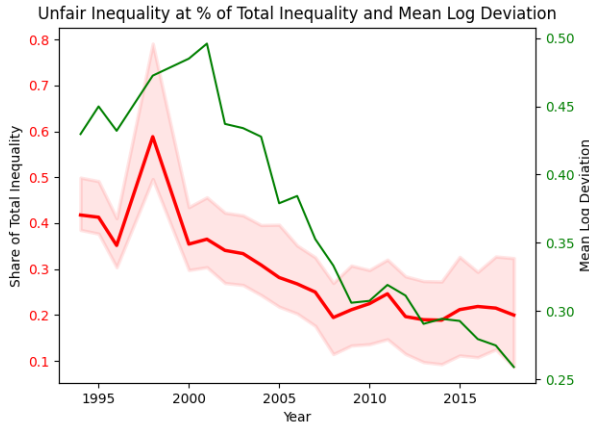


Figure 5: Unfair Inequality with 95% Confidence interval and MLD

5.2 Decomposition

It is also possible to examine which normative principle contributes most to Unfair In-

equality. It is not possible to calculate the exact contribution of each normative principle but it is possible to get the upper and lower boundaries estimates. Upper bounds were calculated using:

1. For Equality of Opportunity:

$$\frac{1}{N} \sum \ln \frac{\mu}{\mu_i^e}$$

2. For Freedom from Poverty:

$$\frac{1}{N} \sum_{i \in P} \left\{ \ln \frac{y_{min}}{y_i^e} - \left(\frac{y_{min} - y_i^e}{y_{min}} \right) \right\} +$$

$$\frac{1}{N} \sum_{i \in R} \left\{ \ln(1 - \tilde{y}_i) + \frac{\tilde{y}_i \tau^{FFP}}{1 - \tilde{y}_i \tau^{FFP}} \right\}$$

Since those two principles are mutually exclusive and collectively exhaustive for our inequality measure, it is possible to deduce the lower boundaries of each by subtracting the upper boundary of the other principle from the total measure of unfair inequality. Figure 6 shows the lower and upper bound of each normative principle as a share of total unfair inequality.

The overwhelming majority of unfair inequality in Russia in this period comes from Freedom from Poverty principle - i.e. the difference of type-means from the overall mean is not as significant as the fact that within types many people fall below the poverty line.

However, the structure of the unfair inequality has seen a substantial change. While Freedom from Poverty was by far the most dominant contributor to unfair inequality in the 1990s and early 2000s, this has changed

gradually. By 2008 the lower boundary of the Freedom from Poverty is less than the higher boundary of the Equality of Opportunity.

Nevertheless, likely due to the 2008 Financial crisis, the shares diverge again, coming close to parity by 2018. Notably, the 2014-2015 Financial crisis in Russia did not increase the share of Freedom from Poverty - in fact, despite the crisis, the share of Freedom from Poverty kept decreasing.

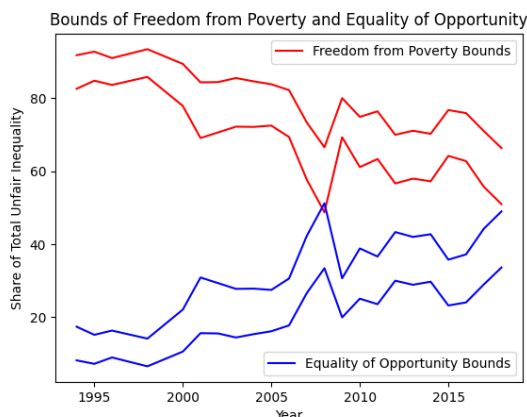


Figure 6: Upper and Lower Bounds of Freedom from Poverty and Equality of Opportunity as a share of Total Unfair Inequality

6 Discussion and Conclusions

The results of this paper should be taken with a grain of salt as many circumstance variables which could, to the knowledge of the author, affect the rate of unfair inequality, have not been used in constructing types. Primarily this was due to the data limitations - there were not enough observations and features

available to account for all possible types. For instance, there is a notable divide between cities and rural areas as well as between large cities and smaller urbanities; there is also a divide between different regions of Russia. Neither of those variables could be considered as the dataset is not representative of Russian regions but only nationally.

However, this does not mean that the result is invalid - it means that in reality, the rate of unfair inequality is likely to be higher than the estimated 20% and could be higher than the upper boundary of 33%.

The main findings of this paper are:

1. Approximately a fifth of total inequality in Russia is contributed by unfair inequality. This rate was significantly higher in the 1990s and early 2000s, reaching 60% and possibly up to 80% in 1998. It has declined since then, plateauing at around 20% by 2010.
2. Most of the unfair inequality in this period constitutes Freedom from Poverty, but by the latter years, the Inequality of Opportunity is rising as well. By 2018 the upper boundary of the Inequality of Opportunity reaches the lower boundary of the Freedom from Poverty.

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